

**Environmental Impact Statement  
for the Proposed  
Areva Eagle Rock Enrichment Facility  
Bonneville County, Idaho**

**Final Environmental Impact Statement**

U.S. Nuclear Regulatory Commission NUREG-1945, Adopted as DOE/EIS-0471

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**U.S. Department of Energy**



**May 2011**

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**Responsible Federal Agency:** U.S. Department of Energy

**Title:** *Final Environmental Impact Statement for the Proposed Areva Eagle Rock Enrichment Facility – Bonneville County, Idaho (Adopted)(DOE/EIS-0471)*

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**Proposed Action:** The U.S. Department of Energy (DOE) is proposing to issue a loan guarantee to Areva Energy Services, LLC (AES), to provide funding for construction of the Eagle Rock Enrichment Facility (EREF) Project. The facility would be located in a rural area in western Bonneville County, Idaho. The EREF would be an advanced uranium enrichment facility utilizing centrifuge technology for the production of commercial nuclear fuel.

In December 2008, prior to DOE Loan Programs Office (LPO) involvement in the EREF project, AES submitted an application for the construction and operation of the EREF to the U.S. Nuclear Regulatory Commission (NRC). As required by Section 193 of the Atomic Energy Act (42 USC § 2243), the NRC prepared an environmental impact statement (EIS) which analyzes the impacts of the proposed plant. NRC issued a final EIS in February 2011 (see NUREG-1945, at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1945/>). The Atomic Safety and Licensing Board has yet to issue its final decision on the issuance of a license to AES for the construction and operation of the EREF.

**Public Involvement:** DOE did not participate as a cooperating agency in the preparation of the February 2011 final EIS; therefore, DOE, in accordance with the National Environmental Policy Act (NEPA) regulations, is recirculating the 2011 final EIS for a period of 30 days and filing it with the U.S. Environmental Protection Agency (EPA). DOE's final EIS is available at the following locations:

- DOE LPO website: [LPO Environmental Impact Statements - Areva EREF](#)
- DOE NEPA website: [DOE Final EISs](#)

DOE will issue a Record of Decision no sooner than 30 days after EPA publishes a Notice of Availability of this final EIS in the *Federal Register*.

DOE conducted an independent review of the NRC final EIS for the purpose of determining whether DOE could adopt it pursuant to 40 CFR 1506.3. As part of DOE's independent review, DOE:

- (1) Reviewed the action contained in the AES loan guarantee application and the proposed action analyzed in the NRC EIS;
- (2) Performed a review under the Farmland Protection Policy Act (FPPA) to assess the effect of the project on prime farmlands;
- (3) Consulted with the Advisory Council on Historic Preservation (ACHP) regarding DOE's compliance with Section 106 of the National Historic Preservation Act.

**(1) Review of the Proposed Action** - DOE reviewed the action encompassed in the AES loan guarantee application to ensure it is the same as the proposed action analyzed in the NRC final EIS. From DOE's review, it concluded that the action encompassed by the AES loan guarantee application is substantially the same as the proposed action analyzed in the NRC final EIS.

**(2) FPPA Review** – DOE assessed the EREF site using the criteria and guidance specified in 7 CFR Part 658 to determine the suitability of the site for protection as farmland. The rule specifies a two-part evaluation for this determination: 1) a site assessment by the Agency involved in the proposal using twelve separate criteria; and, 2) a determination of the relative value of the property as farmland provided by the Natural Resources Conservation Service (NRCS), an agency of the U.S. Department of Agriculture. DOE analyzed the site using the twelve criteria and received a value for the proposed site from the NRCS. After completing the evaluation, it was determined that the proposed site scored below the numeric threshold specified in the rule such that no further consideration for farmland protection of the proposed site is needed and that no alternative sites to avoid prime or unique farmland need to be evaluated.

**(3) ACHP Consultation** - DOE is consulting with ACHP regarding its Section 106 responsibilities under the National Historic Preservation Act. Although DOE would have a different federal action (providing a loan guarantee) than NRC had (issuing a license), DOE's action would not add to or alter the undertaking (per 36 CFR §800.16(y)) that has been subject to the Section 106 review process completed by NRC. Accordingly, DOE's Section 106 compliance requirements for the proposed loan guarantee for the AES EREF project have been satisfied.



NUREG-1945, Vol. 1

# **Environmental Impact Statement for the Proposed Eagle Rock Enrichment Facility in Bonneville County, Idaho**

Final Report

Chapters 1 through 10

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Environmental Management Programs



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# **Environmental Impact Statement for the Proposed Eagle Rock Enrichment Facility in Bonneville County, Idaho**

## **Final Report**

## **Chapters 1 through 10**

Manuscript Completed: February 2011  
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1  
2  
3 **ABSTRACT**

4 On December 30, 2008, AREVA Enrichment Services LLC (AES) submitted an application to  
5 the U.S. Nuclear Regulatory Commission (NRC) for a license to construct, operate, and  
6 decommission the proposed Eagle Rock Enrichment Facility (EREF). The proposed EREF  
7 would be located in Bonneville County, Idaho, approximately 32 kilometers (20 miles) west of  
8 Idaho Falls. Revisions to the license application were submitted by AES on April 23, 2009, and  
9 April 30, 2010. If licensed, the proposed facility would enrich uranium for use in commercial  
10 nuclear fuel for power reactors. AES would employ a gas centrifuge enrichment process to  
11 enrich uranium to up to five percent uranium-235 by weight, with a planned maximum target  
12 production of 6.6 million separative work units (SWUs) per year. AES initiated preconstruction  
13 activities (e.g., site preparation) in late 2010 under an exemption approved by the NRC to  
14 conduct such activities prior to licensing. If its license application is approved, AES expects to  
15 begin facility construction in 2011 and commence initial production in 2014, reaching peak  
16 production in 2022. AES's license would be for a term of 30 years. Prior to license expiration in  
17 2041, AES would seek to renew its license to continue operating the proposed facility or plan for  
18 the decontamination and decommissioning of the proposed facility per the applicable licensing  
19 conditions and NRC regulations. The proposed EREF would be licensed in accordance with the  
20 provisions of the *Atomic Energy Act*. Specifically, an NRC license under Title 10, "Energy," of  
21 the U.S. *Code of Federal Regulations* (10 CFR) Parts 30, 40, and 70 would be required to  
22 authorize AES to possess and use special nuclear material, source material, and byproduct  
23 material at the proposed EREF site.

24 This Environmental Impact Statement (NUREG-1945) (EIS) was prepared in compliance with  
25 the *National Environmental Policy Act of 1969*, as amended (NEPA), and the NRC regulations  
26 for implementing NEPA (10 CFR Part 51). This EIS evaluates the potential environmental  
27 impacts of preconstruction activities and of the proposed action, which is to construct, operate,  
28 and decommission the proposed EREF near Idaho Falls in Bonneville County, Idaho. Also, this  
29 EIS describes the environment potentially affected by AES's proposal, evaluates reasonable  
30 alternatives to the proposed action, describes AES's environmental monitoring program and  
31 mitigation measures, and evaluates the costs and benefits of the proposed action.

32  
33 **Paperwork Reduction Act Statement**

34  
35 This NUREG contains and references information collection requirements that are subject to the  
36 Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were  
37 approved by the Office of Management and Budget, approval numbers 3150-0014, 3150-0017,  
38 3150-0020, 3150-0009, 3150-0002, 3150-0123, and 3150-0047.

39  
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41  
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## EXECUTIVE SUMMARY

### BACKGROUND

Under the provisions of the *Atomic Energy Act* and pursuant to Title 10 of the U.S. *Code of Federal Regulations* (10 CFR) Parts 30, 40, and 70, the U.S. Nuclear Regulatory Commission (NRC) is considering whether to issue a license that would allow AREVA Enrichment Services, LLC (AES) to possess and use byproduct material, source material, and special nuclear material at a proposed gas centrifuge uranium enrichment facility near Idaho Falls in Bonneville County, Idaho, for a period of 30 years. The scope of activities to be conducted under the license would include the construction, operation, and decommissioning of the proposed Eagle Rock Enrichment Facility (EREF). The application for the license was filed with the NRC by AES by letter dated December 30, 2008. Revisions to the license application were submitted by AES on April 23, 2009 (Revision 1) and April 30, 2010 (Revision 2). To support its licensing decision on AES's proposed EREF, the NRC determined that the NRC's implementing regulations in 10 CFR Part 51 for the *National Environmental Policy Act* (NEPA) require the preparation of an Environmental Impact Statement (EIS). The development of this EIS is based on the NRC staff's review of information provided by AES, independent analyses, and consultations with the U.S. Fish and Wildlife Service and other Federal agencies, Native American tribes, the Idaho State Historic Preservation Office (SHPO) and other State agencies, and local government agencies.

The enriched uranium produced at the proposed EREF would be used to manufacture nuclear fuel for commercial nuclear power reactors. Enrichment is the process of increasing the concentration of the naturally occurring and fissionable uranium-235 isotope. Uranium ore usually contains approximately 0.72 weight percent uranium-235. To be useful in light-water nuclear power plants as fuel for electricity generation, the uranium must be enriched up to 5 weight percent uranium-235.

### THE PROPOSED ACTION

The proposed action considered in this EIS is for AES to construct, operate, and decommission a uranium enrichment facility, the proposed EREF, at a site near Idaho Falls in Bonneville County, Idaho. To allow the proposed action to take place, the NRC would issue a license to AES as discussed above. The proposed EREF would be located on a 186-hectare (460-acre) section of a 1700-hectare (4200-acre) parcel of land that it intends to purchase from a single private landowner. Current land uses of the proposed EREF property include native rangeland, nonirrigated seeded pasture, and irrigated cropland. The proposed EREF, if approved, would be situated on the north side of US 20, about 113 kilometers (70 miles) west of the Idaho/Wyoming State line and approximately 32 kilometers (20 miles) west of Idaho Falls. The eastern boundary of the U.S. Department of Energy's (DOE) Idaho National Laboratory (INL) is 1.6 kilometers (1 mile) west of the proposed property. The lands north, east, and south of the proposed property are a mixture of private-, Federal-, and State-owned parcels, with the Federal lands managed by the Bureau of Land Management (BLM).

Using a gas centrifuge process, the proposed EREF would produce uranium enriched up to 5 percent by weight in the isotope uranium-235, with a planned maximum target production of 6.6 million separative work units (SWUs) per year. An SWU is a unit of measurement used in the nuclear industry, pertaining to the process of enriching uranium for use as fuel for nuclear



1 power plants. If the license is approved, facility construction would begin in 2011 with heavy  
2 construction (construction of all major buildings and structures) continuing for 7 years into 2018.  
3 The proposed EREF would begin initial production in 2014 and reach peak production in 2022.  
4 Operations would continue at peak production until approximately 9 years before the license  
5 expires. Decommissioning activities would then begin and be completed by 2041.  
6 Decommissioning would involve the sequential shutdown of the 4 Separation Building Modules  
7 (SBMs) resulting in a gradual decrease in production. Each SBM would take approximately  
8 4.5 years to decommission.

9  
10 Supplemental information on a proposed 161-kilovolt (kV) electrical transmission line required to  
11 power the proposed EREF was submitted by AES on February 18, 2010. The NRC has no  
12 jurisdiction over transmission lines; therefore, the transmission line for the proposed EREF is  
13 not considered part of the proposed action. However, construction and operation of this  
14 transmission line are considered in this EIS under cumulative impacts.

### 15 16 **NRC EXEMPTION FOR AES TO CONDUCT CERTAIN PRECONSTRUCTION ACTIVITIES**

17  
18 On June 17, 2009, AES submitted a request for an exemption from certain NRC regulations to  
19 allow commencement of certain preconstruction activities on the proposed EREF site prior to  
20 NRC's decision to issue a license for the construction, operation, and decommissioning of the  
21 proposed EREF. On March 17, 2010, the NRC granted an exemption authorizing AES to  
22 conduct the requested preconstruction activities. Under the exemption, these preconstruction  
23 activities are not considered by the NRC as part of the proposed action, although the  
24 environmental impacts of these activities are discussed in this EIS along with the impacts of  
25 facility construction.

26  
27 Specifically, the exemption covers the following activities and facilities:

- 28 • clearing of approximately 240 hectares (592 acres) for the proposed EREF
- 29 • site grading and erosion control
- 30 • excavating the site including rock blasting and removal
- 31 • constructing a stormwater retention pond
- 32 • constructing main access and site roadways
- 33 • installing utilities
- 34 • erecting fences for investment protection
- 35 • constructing parking areas
- 36 • erecting construction buildings, offices (including construction trailers), warehouses, and  
37 guardhouses

1 This exemption authorizes AES to conduct the stated activities, provided that none of the  
2 facilities or activities subject to the exemption would be components of AES's Physical Security  
3 Plan or its Standard Practice Procedures Plan for the Protection of Classified Matter, or  
4 otherwise be subject to NRC review or approval. AES initiated preconstruction activities in late  
5 2010.

## 7 **PURPOSE OF AND NEED FOR THE PROPOSED ACTION**

9 The purpose of the proposed action would be to allow AES to construct, operate, and  
10 decommission a facility using gas centrifuge technology to enrich uranium up to 5 percent by  
11 weight of uranium-235, with a production capacity of 6.6 million SWU per year, at the proposed  
12 EREF near Idaho Falls in Bonneville County, Idaho. This facility would contribute to the  
13 attainment of national energy security policy objectives by providing an additional reliable and  
14 economical domestic source of low-enriched uranium to be used in commercial nuclear power  
15 plants.

17 Nuclear power currently supplies approximately 20 percent of the nation's electricity. The  
18 United States Enrichment Corporation Paducah Gaseous Diffusion Plant, Paducah, Kentucky, is  
19 currently the primary U.S. supplier of low-enriched uranium for nuclear fuel in the United States.  
20 However, the URENCO USA facility (formerly known as the National Enrichment Facility) in Lea  
21 County, New Mexico, which began initial operations in June 2010, may provide additional  
22 enrichment services in the future as construction continues on its remaining cascade halls. The  
23 American Centrifuge Plant (ACP) in Piketon, Ohio, which is currently under construction, and  
24 the proposed Global Laser Enrichment (GLE) Facility in Wilmington, North Carolina, for which  
25 the NRC is currently reviewing its license application, may also provide additional domestic  
26 enrichment services in the future. The existing operating Paducah, Kentucky, enrichment plant  
27 supplies approximately 15 percent of the current U.S. demand for low-enriched uranium. The  
28 United States Enrichment Corporation also imports downblended (diluted) weapons-grade  
29 uranium from Russia through the Megatons to Megawatts Program to supply an additional  
30 38 percent of the U.S. demand. The remaining 47 percent of low-enriched uranium is imported  
31 from foreign suppliers. The current primary dependence on a single U.S. supplier and foreign  
32 sources for low-enriched uranium imposes reliability risks for the nuclear fuel supply to  
33 U.S. nuclear power plants. National energy policy emphasizes the importance of having a  
34 reliable domestic source of enriched uranium for national energy security. The production of  
35 enriched uranium at the proposed EREF would be equivalent to about 40 percent of the current  
36 and projected demand (15 to 16 million SWUs) for enrichment services within the United States.

## 38 **ALTERNATIVES TO THE PROPOSED ACTION**

40 In this EIS, the NRC staff considered a reasonable range of alternatives to the proposed action,  
41 including alternative sites for an AES enrichment facility, alternative sources of low-enriched  
42 uranium, alternative technologies for uranium enrichment, and the no-action alternative. Two of  
43 the alternatives, the proposed action and the no-action alternative, were analyzed in detail. The  
44 approved preconstruction activities discussed earlier are assumed to occur prior to NRC's  
45 decision to grant a license to AES and, therefore, are assumed to occur under both the  
46 proposed action and the no-action alternative.

1 Under the no-action alternative, the proposed EREF would not be constructed, operated, and  
2 decommissioned in Bonneville County, Idaho. Uranium enrichment services would continue to  
3 be performed by existing domestic and foreign uranium enrichment suppliers. However,  
4 URENCO USA would provide and the ACP and potentially the proposed GLE Facility may  
5 provide enrichment services in the future.  
6

7 AES considered 44 alternative sites throughout the United States. AES evaluated these sites  
8 based on various technical, safety, economic, and environmental selection criteria, and  
9 concluded that the Eagle Rock site in Bonneville County, Idaho, met all of the criteria. The NRC  
10 staff reviewed AES's site-selection process and results to determine if any site considered by  
11 AES was obviously superior to the proposed Eagle Rock site. The NRC staff determined that  
12 the process used by AES was rational and objective, and that its results were reasonable.  
13 Based on its review, the NRC staff concluded that none of the candidate sites were obviously  
14 superior to the AES preferred site in Bonneville County, Idaho.  
15

16 The NRC staff examined three alternatives to satisfy domestic enrichment needs: (1) reactivate  
17 the Portsmouth Gaseous Diffusion Plant near Piketon, Ohio; (2) downblend highly enriched  
18 uranium instead of constructing a domestic uranium enrichment facility; and (3) purchase low-  
19 enriched uranium from foreign sources. These alternatives were eliminated from further  
20 consideration based on concerns related to reliability, excessive energy consumption, and  
21 national energy security, and did not meet national energy policy objectives involving the need  
22 for a reliable, economical source of domestic uranium enrichment.  
23

24 The NRC staff also evaluated alternative technologies to the gas centrifuge process:  
25 electromagnetic isotope separation, liquid thermal diffusion, gaseous diffusion, Atomic Vapor  
26 Laser Isotope Separation, Molecular Laser Isotope Separation, and separation of isotopes by  
27 laser excitation. These technologies were eliminated from further consideration based on  
28 factors such as the technology immaturity, economic impracticality, or exclusive licensing.  
29

30 In addition, the NRC staff considered conversion and disposition methods for depleted uranium  
31 hexafluoride (UF<sub>6</sub>): (1) beneficial use of depleted UF<sub>6</sub>, and (2) conversion at facilities other than  
32 the new facilities that the U.S. Department of Energy (DOE) has built at Portsmouth and  
33 Paducah. For the purposes of this analysis, because the current available inventory of depleted  
34 uranium exceeds the current and projected future demand for the material, the depleted UF<sub>6</sub>  
35 generated by the proposed EREF was considered a waste product, and disposition alternatives  
36 involving its use as a resource were not further evaluated.  
37

38 Existing fuel fabrication facilities have not expressed an interest in performing depleted UF<sub>6</sub>  
39 conversion services, and the cost for the services would be difficult to estimate; therefore, this  
40 alternative was eliminated from further consideration. However, International Isotopes, Inc.  
41 submitted a license application to the NRC on December 31, 2009, to construct and operate a  
42 depleted UF<sub>6</sub> conversion facility near Hobbs, New Mexico. On February 23, 2010, the NRC  
43 staff accepted the license application, and has initiated a formal safety and environmental  
44 review.  
45  
46

1 **POTENTIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION**

2  
3 This EIS evaluates the potential environmental impacts of the proposed action. A standard of  
4 significance has been established for assessing environmental impacts. Following the Council  
5 on Environmental Quality’s regulations in 40 CFR 1508.27, the NRC staff has assigned each  
6 impact one of the following three significance levels:

- 7  
8 • SMALL. The environmental effects are not detectable or are so minor that they would  
9 neither destabilize nor noticeably alter any important attribute of the resource.  
10  
11 • MODERATE. The environmental effects are sufficient to noticeably alter but not destabilize  
12 important attributes of the resource.  
13  
14 • LARGE. The environmental effects are clearly noticeable and are sufficient to destabilize  
15 important attributes of the resource.  
16

17 As described in Chapter 4, the environmental impacts of preconstruction and the proposed  
18 action would mostly be SMALL. Some potential impacts would be SMALL to MODERATE or  
19 MODERATE in a few cases; and there would be LARGE, though intermittent, short-term  
20 impacts in one resource area during preconstruction. Methods for mitigating the potential  
21 impacts are identified in Chapters 4 and 5. Environmental measurement and monitoring  
22 methods are described in Chapter 6.  
23

24 Summarized below are the potential environmental impacts of the proposed action on each of  
25 the resource areas considered in this EIS. Each summary is preceded by the impact  
26 significance level for the respective resource areas.  
27

28 **Land Use**

29  
30 SMALL. The construction of a uranium enrichment facility would alter the current land use,  
31 which consists primarily of agriculture and undeveloped rangeland. The 240-hectare (592-acre)  
32 proposed EREF site under consideration would be located entirely on a 1700-hectare  
33 (4200-acre) private parcel of land. Bonneville County has zoned the location as G-1, Grazing,  
34 which allows for industrial development, and is intended to allow certain activities that should be  
35 removed from population centers in the county. The operation of a uranium enrichment facility  
36 is consistent with the county’s zoning. It is not anticipated that construction and operation of the  
37 proposed EREF would have any effect on the current land uses found on the surrounding public  
38 lands managed by the BLM.  
39

40 Restrictions to land use would begin with the purchase of the proposed property by AES. The  
41 alteration of land use would begin during preconstruction and continue during construction.  
42 Preconstruction activities would result in the alteration of the land as a result of activities such  
43 as land clearing and grading, restricted access to the proposed EREF property, and cessation  
44 of agricultural uses (grazing and crop production). The majority of impacts to land use would  
45 occur during preconstruction. However, since large land areas in the county will continue to be  
46 used for grazing and crop production, including the BLM-managed lands surrounding the  
47 proposed EREF property, land use impacts resulting from preconstruction and construction  
48 would be SMALL.  
49

1 Operation of the proposed EREF would restrict land use on the proposed property to the  
2 production of enriched uranium. The operation of the proposed EREF is not expected to alter  
3 land use on adjacent properties. Impacts on land use due to operations would be SMALL.  
4

5 At the end of decommissioning, the buildings and structures would be available for unrestricted  
6 use. As a result, impacts on land use due to decommissioning would be SMALL.  
7

## 8 **Historic and Cultural Resources**

9  
10 SMALL TO MODERATE. Impacts to historic and cultural resources would occur primarily  
11 during preconstruction. Construction would take place on ground previously disturbed by  
12 preconstruction activities. There are 13 cultural resource sites (3 prehistoric, 6 historic, and  
13 4 multi-component) in the surveyed areas of the proposed EREF property. One of these sites,  
14 the John Leopard Homestead (MW004), is located within the footprint of the proposed EREF,  
15 and has been recommended as eligible for the *National Register of Historic Places*. Site  
16 MW004 would be destroyed by preconstruction activities. However, AES mitigated impacts to  
17 site MW004 prior to land disturbance through professional excavation and data recovery, and  
18 other similar homestead site types exist in the region. Therefore, the impact to site MW004  
19 would be limited to a MODERATE level.  
20

21 Construction and operation of the proposed EREF would be unlikely to result in visual or noise  
22 impacts on the Wasden Complex, an important group of archaeological sites, because it is  
23 located approximately 1.6 kilometers (1.0 mile) from the proposed EREF site and sits behind a  
24 ridge that partially blocks the view. Other impacts during operations would be SMALL because  
25 no intact historic or cultural resources would remain.  
26

27 Decommissioning would not likely affect historic and cultural resources because any areas  
28 disturbed during decommissioning would have been previously disturbed during preconstruction  
29 and construction. Therefore, impacts would be SMALL.  
30

## 31 **Visual and Scenic Resources**

32  
33 SMALL TO MODERATE. Impacts to visual and scenic resources result when contrasts are  
34 introduced into a visual landscape. The proposed project site and surrounding areas consist  
35 primarily of sagebrush semi-desert to the north, east, and west of the proposed site. The  
36 proposed facility would be located approximately 2.4 kilometers (1.5 miles) from areas of public  
37 view, including US 20 and the Hell's Half Acre Wilderness Study Area (WSA) to the south which  
38 contains the remains of a 4000-year-old lava flow. The BLM gave a Visual Resource  
39 Management (VRM) Class I designation to the WSA, which applies to areas of high scenic  
40 quality.  
41

42 Visual impacts during preconstruction could result along US 20 from increased activity at the  
43 proposed site and fugitive dust, but these would be of a relatively short duration. The clearing of  
44 vegetation and installation of a perimeter fence would change the visual setting; however, they  
45 would not drastically alter the overall appearance of the area. Impacts on visual and scenic  
46 resources due to preconstruction would be SMALL.  
47



1 Construction of the proposed EREF would introduce visual intrusions that are out of character  
2 with the surrounding area. While initial construction activities would commence on a cleared  
3 area, such a view is not very intrusive on the visual landscape. Similarly, fugitive dust  
4 generated during the construction period would be of a temporary nature and cause minimal  
5 disturbance to the viewshed. However, because of the extent of the proposed EREF project,  
6 the type and size of equipment involved in construction, and the industrial character of buildings  
7 to be built, construction of the proposed EREF would create significant contrast with the  
8 surrounding visual environment, which is predominantly rangeland and cropland. Thus, visual  
9 impact levels associated with construction would range from SMALL to MODERATE.

10  
11 Construction and operation of the proposed EREF would be unlikely to result in visual impacts  
12 on the Wasden Complex due to its distance from the proposed EREF site and location behind a  
13 ridgeline that obscures views of the lower portions of the proposed facility. However, operations  
14 would have an impact on the surrounding visual landscape. The proposed facility is visually  
15 inconsistent with the current setting, and its operation is expected to alter the visual rating on  
16 surround public lands, which would be a MODERATE visual impact. Also, plant lighting at night  
17 could be perceivable at the trailhead of the Hell's Half Acre WSA, although probably not from  
18 the Craters of the Moon National Park located 72 kilometers (45 miles) to the west of the  
19 proposed EREF site.

20  
21 At the end of decommissioning, the buildings and structures would be available for unrestricted  
22 use. As a result, impacts on visual and scenic resources would remain MODERATE.

## 23 24 **Air Quality**

25  
26 SMALL to LARGE. Air emissions during preconstruction and construction would include fugitive  
27 dust from heavy equipment working on the proposed site, engine emissions from construction  
28 equipment onsite and vehicles transporting workers and materials to the proposed site, and  
29 emissions from diesel-fueled generators. The generators, although not intended to provide  
30 power for construction activities, would be operated weekly for preventative maintenance.  
31 During preconstruction, fugitive dust from land clearing and grading operations would result in  
32 large releases of particulate matter. Such impacts would be MODERATE to LARGE during  
33 certain preconstruction periods and activities that would be temporary and brief in duration.  
34 Otherwise, impacts on ambient air quality from preconstruction would be SMALL for all  
35 hazardous air pollutants (HAPs) and all criteria pollutants except particulates. Air quality  
36 impacts during construction would be SMALL for all HAPs and all criteria pollutants.

37  
38 During operations, the proposed EREF would not be a major source of air emissions, although  
39 there is a potential for small gaseous releases associated with operation of the process that  
40 could contain UF<sub>6</sub>, hydrogen fluoride (HF), and uranyl fluoride (UO<sub>2</sub>F<sub>2</sub>). Also, small amounts of  
41 nonradioactive air emissions consisting of carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>),  
42 particulate matter (PM), volatile organic compounds (VOCs), and sulfur dioxide (SO<sub>2</sub>) would be  
43 released:

- 44 • from the auxiliary diesel electric generators to supply electrical power when power from the  
45 utility grid is not available
- 46
- 47 • during building and equipment maintenance activities
- 48

- 1 • from trucks, automobiles, and other vehicles in use onsite

2  
3 Air emissions are not expected to impact regional visibility. Ambient air modeling predicts that  
4 impacts on ambient air quality from the routine operation of the proposed EREF would be  
5 SMALL with respect to all criteria pollutants and all HAPs.

6  
7 During decommissioning, impacts would result from emissions including fugitive dust (mitigated  
8 by dust suppression work practices) and CO, NO<sub>x</sub>, PM, VOCs, and SO<sub>2</sub> from transportation  
9 equipment and would be SMALL.

## 10 11 **Geology and Soils**

12  
13 SMALL. Impacts on about 240 hectares (592 acres) of land would occur primarily during  
14 preconstruction, as a result of soil-disturbing activities (blasting, excavating, grading, and other  
15 activities) that loosen soil and increase the potential for erosion. Because these impacts are  
16 short-term and can be mitigated, impacts on geology and soils would be SMALL. Construction  
17 activities could cause short-term impacts such as an increase in soil erosion at the proposed  
18 site. Soil erosion could result from wind action and rain, although rainfall in the vicinity of the  
19 proposed site is low. Compaction of soils due to heavy vehicle traffic would increase the  
20 potential for soil erosion via runoff. Impacts would be SMALL.

21  
22 Impacts on soils during operations at the proposed facility would also be SMALL because  
23 activities would not increase the potential for soil erosion beyond that for the surrounding area.  
24 The impacts to soil quality from atmospheric deposition of pollutants during operations would be  
25 SMALL.

26  
27 Land disturbance associated with decommissioning could temporarily increase the potential for  
28 soil erosion at the proposed EREF site, resulting in impacts similar to (but less than) those  
29 during the preconstruction/construction phase. As a result, impacts to soils due to  
30 decontamination and decommissioning activities would be SMALL.

## 31 32 **Water Resources**

33  
34 SMALL. During preconstruction and construction, stormwater runoff would be diverted to a  
35 stormwater detention basin, thus the potential for contaminated stormwater discharging to water  
36 bodies on adjacent properties is low. No surface water sources would be used. Natural surface  
37 water bodies are absent within and near the proposed EREF site, and groundwater occurs at  
38 depths of 202 meters (661 feet) to 220 meters (722 feet). Annual maximum groundwater usage  
39 rates from the Eastern Snake River Plain (ESRP) aquifer in Bonneville County during  
40 preconstruction and construction comprise about 16 percent of the annual water right  
41 appropriation that has been transferred to the proposed property for use as industrial water.  
42 Therefore, impacts on surface water quality, the regional water supply, and groundwater quality  
43 during preconstruction and construction would be SMALL.

44  
45 Water usage rates during operations would remain well within the water right appropriation.  
46 Both average and peak annual water use requirements would be less than 1 percent of the total  
47 groundwater usage from the ESRP aquifer. No process effluents would discharge to the  
48 retention or detention basins or into surface water. Therefore, liquid effluents would have a

1 SMALL impact on water resources. Because all the water discharged to the Cylinder Storage  
2 Pads Stormwater Retention Basins would evaporate, the basins would have a SMALL impact  
3 on the quality of water resources. The site Stormwater Detention Basin seepage would also  
4 have a SMALL impact on water resources of the area because no wastewater would be  
5 discharged to the basin.  
6

7 Since the usage and discharge impacts to water resources during the decommissioning phase  
8 would be similar to those during construction, the impacts to water resources would remain  
9 SMALL.

## 10 11 **Ecological Resources**

12  
13 SMALL TO MODERATE. Preconstruction activities such as land clearing could result in direct  
14 impacts due to habitat loss and wildlife mortality as well as indirect impacts to ecological  
15 resources in surrounding areas, primarily from fugitive dust and wildlife disturbance.  
16 Approximately 75 hectares (185 acres) of sagebrush steppe habitat and 55 hectares  
17 (136 acres) of nonirrigated pasture would be eliminated. Impacts on plant communities and  
18 wildlife from preconstruction would be MODERATE. Construction activities that could impact  
19 ecological resources include constructing the proposed UF<sub>6</sub> storage pads and EREF buildings.  
20 However, most construction activities would occur in areas that would have already been  
21 disturbed by preconstruction activities. Impacts on vegetation would occur primarily from any  
22 additional vegetation clearing. Impacts would include the generation of fugitive dust, spread of  
23 invasive species, changes in drainage patterns, soil compaction, erosion of disturbed areas,  
24 potential sedimentation of downgradient habitats, and accidental releases of hazardous or toxic  
25 materials (e.g., fuel spills). These activities could also result in some wildlife mortality and would  
26 cause other wildlife to relocate as a result of noise, lighting, traffic, and human presence.  
27 Collisions with construction equipment and other vehicles may cause some wildlife mortality.  
28 No rare or unique plant communities, or threatened or endangered species, have been found or  
29 are known to occur on the proposed site, although habitat on the proposed property is known to  
30 be used by greater sage-grouse (a Federal candidate species). Construction (and  
31 preconstruction) activities are not expected to result in population-level impacts on any  
32 Federally listed or State-listed species, which the U.S. Fish and Wildlife Service has stated are  
33 not present on the proposed EREF property. Impacts of construction of the proposed facility  
34 would be SMALL.  
35

36 Operation of the proposed EREF could result in impacts on wildlife and plant communities as a  
37 result of noise, lighting, traffic, human presence, air emissions, and retention/detention ponds.  
38 However, these impacts would be SMALL.  
39

40 Vegetation and wildlife that became established near the proposed facility could be affected by  
41 decommissioning activities. Impacts during decommissioning would be similar to those during  
42 construction and would be SMALL.  
43

## 44 **Noise**

45  
46 SMALL. Most of the major noise-producing activities (site clearing and grading, excavations  
47 [including the use of explosives], utility burials, construction of onsite roads [including the US 20  
48 interchanges], and construction of the ancillary buildings and structures) would occur during



1 preconstruction. Noise impacts from initial preconstruction activities may exceed established  
2 standards at some locations along the proposed EREF property boundary for relatively short  
3 periods of time. However, because of the distances involved, expected levels of attenuation,  
4 application of mitigation measures, and the expected limited presence of human receptors at  
5 these locations, the impacts of noise during preconstruction would be SMALL for human  
6 receptors. The nearest resident is located approximately 7.7 kilometers (4.8 miles) east of the  
7 proposed site. No residence is expected to experience unacceptable noise levels during  
8 construction. Noise impacts from construction may exceed established standards at some  
9 offsite locations for relatively short periods of time. However, because of the distances involved,  
10 expected levels of attenuation, and AES's commitment to appropriate mitigations, the impacts  
11 would be SMALL for human receptors. During the overlap period when partial operations begin  
12 while building construction continues, noise impacts from construction and operation are  
13 expected to be additive, but still substantially reduced from noise levels during initial  
14 construction.

15  
16 Major noise sources associated with facility operation include the six diesel-fueled emergency  
17 generators, commuter traffic, the movement of delivery vehicles, and operation of various  
18 pumps, compressors, and cooling fans. Operational noise estimates at the proposed property  
19 boundary satisfy all relevant or potentially relevant U.S. noise standards and guidance.  
20 Residents in the vicinity of US 20, who would otherwise be unaffected by noise from the  
21 proposed EREF industrial footprint, would be impacted by slightly increased traffic noise. Noise  
22 impacts from proposed EREF operation would be SMALL.

23  
24 Noise sources and levels during decommissioning would be similar to those during construction,  
25 and peaking noise levels would be expected to occur for short durations. As a result, noise  
26 impacts from decommissioning would be SMALL.

## 27 28 **Transportation**

29  
30 SMALL TO MODERATE. Preconstruction activities for the proposed EREF would cause an  
31 impact on the local transportation network due to the construction of highway entrances, the  
32 daily commute of workers, daily construction deliveries, and waste shipments. Traffic  
33 slowdowns or delays would only be expected to occur at the entrance to the proposed EREF  
34 during access road construction and shift changes; the impacts on overall traffic patterns and  
35 volumes would be MODERATE on US 20 and SMALL on Interstate 15 (I-15). The primary  
36 impact would be increased traffic on nearby roads. Impacts during construction would occur  
37 from transportation of personnel, construction materials, and nonradiological waste. All traffic to  
38 and from the proposed EREF during preconstruction and construction would use US 20.  
39 Construction activities at the proposed EREF site could result in a 55 percent increase in traffic  
40 volume on US 20 (including the period when construction and operations overlap). Because  
41 traffic volume is expected to remain below the design capacity of I-15 and traffic slowdowns or  
42 delays would only be expected to occur at the entrance to the proposed EREF during shift  
43 changes, the impacts on overall traffic patterns and volumes during construction would be  
44 SMALL to MODERATE on US 20 and SMALL on I-15. For the most part, the impacts from the  
45 truck traffic to and from the proposed site during construction would be SMALL.

46  
47 Operations impacts would occur from the transport of personnel, nonradiological materials, and  
48 radioactive material to and from the proposed EREF, especially during the period when

1 construction and operation overlap. Increased traffic during facility operation would have a  
2 SMALL to MODERATE impact on the current traffic on US 20 (SMALL for any off-peak shift  
3 change). The impacts of truck traffic to and from the proposed site during operation would be  
4 SMALL. Annual transportation routine impacts and accident risks (radiological and chemical)  
5 would be SMALL.  
6

7 Traffic during the initial portion of the decommissioning would be approximately the same as for  
8 the period when construction and operations overlap. Traffic after the cessation of operations  
9 would be less than during either construction or operation. Impacts on local traffic on US 20  
10 would be SMALL to MODERATE.  
11

## 12 **Public and Occupational Health**

13

14 SMALL. During preconstruction, impacts on occupational safety resulting from injuries,  
15 illnesses, and exposures to fugitive dust, pollutants, and vapors would be SMALL, based on  
16 estimates of the number of incidents. During construction, nonradiological impacts could  
17 include injuries and illnesses incurred by workers and impacts due to exposure to chemicals or  
18 other nonradiological substances. All such potential impacts would be SMALL because all  
19 activities would take place under typical construction workplace safety regulations. No  
20 radiological impacts are expected during facility construction.  
21

22 Nonradiological impacts during facility operation include worker illnesses and injuries and  
23 impacts from worker or public exposure to hazardous chemicals used or present during  
24 operations, mainly uranium and HF. Due to low estimated concentrations of uranium and HF at  
25 public (proposed property boundary) and workplace receptor locations, nonradiological impacts  
26 due to exposures to hazardous chemicals (including uranium and HF) during operations would  
27 be SMALL.  
28

29 Assessment of potential radiological impacts from facility operations considers both public and  
30 occupational exposures to radiation, and includes exposures to workers completing the facility  
31 construction during initial phases of operation. Exposure pathways include inhalation of  
32 airborne contaminants, ingestion of contaminated food crops, direct exposure from material  
33 deposited on the ground, and external exposure associated with the stored UF<sub>6</sub> cylinders.  
34 Impacts from exposure of members of the public would be SMALL. Worker exposures would  
35 vary by job type, but would be carefully monitored and maintained as low as reasonably  
36 achievable (ALARA) and impacts would be SMALL.  
37

38 For a hypothetical individual member of the public at the proposed EREF property boundary and  
39 the nearest resident, the maximum annual total effective dose equivalents would be 0.014  
40 millisievert per year (1.4 millirem per year) and  $2.1 \times 10^{-6}$  millisievert per year ( $2.1 \times 10^{-4}$  millirem  
41 per year), respectively. Dose equivalents attributable to operation of the proposed EREF would  
42 be small compared to the normal background radiation range of 2.0 to 3.0 millisieverts (200 to  
43 300 millirem) dose equivalent. This equates to radiological impacts during proposed EREF  
44 operation that would be SMALL.  
45

46 The nature of decommissioning activities would be similar to that during construction and  
47 operation. Impacts from occupational injuries and illnesses and chemical exposures would be  
48 SMALL. Occupational radiological exposures would be bounded by the potential exposures

1 during operation, because the quantities of uranium material handled would be less than or  
2 equal to that during operations. An active environmental monitoring and dosimetry (external  
3 and internal) program would be conducted to maintain ALARA doses to workers and to  
4 individual members of the public. Therefore, the impacts of decommissioning on public and  
5 occupational health would be SMALL.

## 6 7 **Waste Management**

8  
9 SMALL. Solid nonhazardous wastes generated during preconstruction would be transported  
10 offsite to an approved local landfill. Hazardous wastes (e.g., waste oil, greases, excess paints,  
11 and other chemicals) generated during preconstruction would be packaged and shipped offsite  
12 to a licensed treatment, storage, and disposal facility (TSDF). Impacts from nonhazardous solid  
13 waste and hazardous waste generation during preconstruction would be SMALL due to the  
14 available current or future capacity at local and regional disposal facilities. Construction would  
15 generate about 6116 cubic meters (8000 cubic yards) of nonhazardous solid waste per year, not  
16 including recyclable materials such as scrap structural steel, sheet metal, and piping. About  
17 23,000 liters (6200 gallons) and 1000 kilograms (2200 pounds) of hazardous waste would be  
18 generated annually. The impacts of nonhazardous and hazardous waste generation during  
19 construction would be SMALL due to the available current or future capacity at local and  
20 regional disposal facilities.

21  
22 During operation, approximately 70,307 kilograms (154,675 pounds) of industrial,  
23 nonhazardous, nonradioactive solid waste and approximately 146,400 kilograms  
24 (322,080 pounds) of low-level radioactive waste (not including depleted UF<sub>6</sub>) are expected to be  
25 generated annually. The proposed facility would also generate approximately 5062 kilograms  
26 (11,136 pounds) of hazardous wastes and 100 kilograms (220 pounds) of mixed waste  
27 annually. All wastes would be transferred to offsite licensed waste disposal facilities with  
28 suitable disposal capacity. The impacts of this waste generation would be SMALL.

29  
30 During peak operation, the proposed EREF is expected to generate 1222 cylinders of depleted  
31 UF<sub>6</sub> annually, which would be temporarily stored on an outdoor cylinder storage pad in  
32 approved Type 48Y containers before being transported to a DOE-owned or private conversion  
33 facility. Storage of uranium byproduct cylinders at the proposed EREF would occur for the  
34 duration of, but not beyond, the proposed facility's 30-year operating lifetime. The impacts from  
35 temporary storage of depleted UF<sub>6</sub>, from the conversion of depleted UF<sub>6</sub> to U<sub>3</sub>O<sub>8</sub> at an offsite  
36 location, and from the transportation of the U<sub>3</sub>O<sub>8</sub> conversion product to a potential disposal site  
37 would be SMALL.

38  
39 During decommissioning, radioactive material from decontamination of contaminated equipment  
40 would be packaged and shipped offsite for disposal. Wastes to be disposed would include  
41 7700 cubic meters (10,070 cubic yards) of low-level radioactive waste. Due to the availability of  
42 adequate disposal capacity, waste management impacts would be SMALL.

## 43 44 **Socioeconomics**

45  
46 SMALL. Employment and income impacts were evaluated using an 11-county ROI in Idaho –  
47 including Bannock, Bingham, Blaine, Bonneville, Butte, Caribou, Clark, Fremont, Jefferson,  
48 Madison, and Power Counties. Wage and salary spending and expenditures associated with

1 materials, equipment, and supplies would produce income and employment and local and State  
2 tax revenue, resulting in a beneficial impact. Preconstruction would create 308 jobs and  
3 \$11.9 million in the first year, and 1687 jobs would be created during the peak year of  
4 construction with \$65.0 million of income. Operations would produce 3289 jobs and  
5 \$92.4 million in income in the first year of full operations. The jobs created include jobs at the  
6 proposed EREF and those indirectly created elsewhere in the 11-county ROI due to  
7 preconstruction, construction, and operation of the proposed EREF. Because preconstruction  
8 and construction activities would constitute less than 1 percent of total 11-county ROI  
9 employment, the economic impact of constructing the proposed EREF would, therefore, be  
10 SMALL.

11  
12 As it is anticipated that a number of workers will move into the area during each phase of the  
13 proposed project, with the majority of the demographic and social impacts associated with  
14 population in-migration likely to occur in Bingham and Bonneville Counties, the impacts of the  
15 proposed EREF on population, housing, and community services are assessed for a two-county  
16 ROI, consisting of Bingham and Bonneville Counties. The migration of workers and their  
17 families into surrounding communities would affect housing availability, area community  
18 services such as healthcare, schools, and law enforcement, and the availability and cost of  
19 public utilities such as electricity, water, sanitary services, and roads resulting in an adverse  
20 impact. Because of the small number of in-migrating workers expected during preconstruction,  
21 construction, and operations, the impact on housing and community and educational services  
22 employment would be SMALL.

23  
24 Decommissioning would provide continuing employment opportunities for some of the existing  
25 workforce and for other residents of the 11-county ROI. Additional, specialized  
26 decommissioning workers would also be required from outside the 11-county ROI.  
27 Expenditures on salaries and materials would contribute to the area economy, although less  
28 than during operations, and the State would continue to collect sales tax and income tax  
29 revenues. The socioeconomic impact of decommissioning activities would be SMALL.

30  
31 **Environmental Justice**

32  
33 SMALL. The potential impacts of the proposed EREF would mostly be SMALL for the resource  
34 areas evaluated. For these resources areas, the impacts on all human populations would be  
35 SMALL. Potential impacts would be SMALL to MODERATE or MODERATE in a few cases,  
36 which could potentially affect environmental justice populations; and there would be LARGE,  
37 though intermittent, short-term impacts from fugitive dist during preconstruction. However, as  
38 there are no low-income or minority populations within the 4-mile area around the proposed  
39 facility, these impacts would not be disproportionately high and adverse for these population  
40 groups.

41  
42 Impacts of decommissioning would be SMALL. Because impacts on the general population  
43 would generally be SMALL to MODERATE in other resource areas, and because there are no  
44 low-income or minority populations defined according to Council on Environmental Quality  
45 (CEQ) guidelines within the 4-mile area around the proposed facility, decommissioning would  
46 not be expected to result in disproportionately high or adverse impacts on minority or low-  
47 income populations.

48

1 **Accidents**

2  
3 SMALL TO MODERATE. Six accident scenarios were evaluated in this EIS as a representative  
4 selection of the types of accidents that are possible at the proposed EREF. The representative  
5 accident scenarios selected vary in severity from high- to intermediate-consequence events and  
6 include accidents initiated by natural phenomena (earthquake), operator error, and equipment  
7 failure. The consequence of a criticality accident would be high (fatality) for a worker in close  
8 proximity. Worker health consequences are low to high from the other five accidents that  
9 involve the release of UF<sub>6</sub>. Radiological consequences to a maximally exposed individual (MEI)  
10 at the Controlled Area Boundary (proposed EREF property boundary) are low for all six  
11 accidents including the criticality accident. Uranium chemical exposure to the MEI is high for  
12 one accident and low for the remainder. For HF exposure to an MEI at the proposed property  
13 boundary, the consequence of three accidents is intermediate, with a low consequence  
14 estimated for the remainder. All accident scenarios predict consequences to the collective  
15 offsite public of less than one lifetime cancer fatality. Impacts from accidents would be SMALL  
16 to MODERATE. Plant design, passive and active engineered and administrative controls, and  
17 management of these controls would reduce the likelihood of accidents.

18  
19 **POTENTIAL ENVIRONMENTAL IMPACTS OF THE NO-ACTION ALTERNATIVE**

20  
21 This EIS also considers the potential environmental impacts of the no-action alternative, which  
22 are summarized below. It is assumed that preconstruction activities have taken place under the  
23 no-action alternative. The impact conclusions presented in this EIS for the no-action alternative  
24 address the impacts of denying the license, but do not include the impacts of the NRC-approved  
25 preconstruction activities. This is because a decision by the NRC not to issue the license does  
26 not cause the impacts of preconstruction under the no-action alternative. As described in  
27 Chapter 4, the anticipated environmental impacts from the no-action alternative would range  
28 from SMALL to MODERATE.

29  
30 Should the nation's need for enriched uranium continue to increase and necessitate the  
31 construction and operation of another domestic enrichment facility at an alternate location,  
32 impacts could occur for each resource area and could range from SMALL to LARGE. The  
33 nature and scale of these impacts could be similar to those of the proposed action, but would  
34 depend on several facility- and site-specific factors.

35  
36 **Land Use**

37  
38 SMALL. Under the no-action alternative, AES would purchase the proposed property and  
39 restrictions on grazing and agriculture would occur. The zoning designation for the property  
40 would remain G-1 Grazing whether or not the proposed EREF is constructed. Current land  
41 uses of grazing and farming could potentially resume. Impacts to local land use would be  
42 SMALL.

43  
44 **Historic and Cultural Resources**

45  
46 SMALL TO MODERATE. Under the no-action alternative, the proposed EREF would not be  
47 constructed. Site MW004 would not be affected by NRC's licensing action, and Section 106 of  
48 the *National Historic Preservation Act* would not apply because no Federal action would be



1 involved. However, the removal of site MW004, which has already occurred, resulted in a  
2 LARGE impact because the site no longer exists; but because AES removed this site through  
3 professional excavation and data recovery and there are other homestead sites of this type  
4 found in the region, the impact has been mitigated to a MODERATE level. No visual or noise  
5 effects would occur to the viewshed for the Wasden Complex.  
6

## 7 **Visual and Scenic Resources**

8  
9 SMALL. Under the no-action alternative, since the proposed EREF would not be constructed,  
10 no visual intrusions to the existing landscape would occur. The current land cover would be  
11 altered, but no large industrial structures would be constructed. The existing natural character  
12 of the area would largely remain intact. The lack of development would be consistent with  
13 BLM's VRM Class I designation for the Hell's Half Acre WSA, and no intrusions to the Wasden  
14 Complex viewshed would occur.  
15

## 16 **Air Quality**

17  
18 SMALL. Under the no-action alternative, the air quality impacts associated with construction  
19 and operation of the proposed EREF would not occur. The proposed site could revert to  
20 agricultural activities, which would impact ambient air quality through the release of criteria  
21 pollutants from the operation of agricultural vehicles and equipment and the release of fugitive  
22 dusts from the tilling of soils. Local air impacts associated with the no-action alternative would  
23 be SMALL.  
24

## 25 **Geology and Soils**

26  
27 SMALL. Under the no-action alternative, no additional land disturbance from construction would  
28 occur, and the proposed site could revert to crop production and grazing activities. Wind and  
29 water erosion would continue to be the most significant natural processes affecting the geology  
30 and soils at the proposed site. Impacts would be SMALL.  
31

## 32 **Water Resources**

33  
34 SMALL. Under the no-action alternative, additional water use may or may not occur, depending  
35 on future plans for the proposed property. Water resources would be unchanged. Water usage  
36 could continue at the current rate should agricultural activities resume at the proposed site. No  
37 changes to surface water quality would be expected, and the natural (intermittent) surface flow  
38 of stormwater on the proposed site would continue. No additional groundwater use or adverse  
39 changes to groundwater quality would be expected. Impacts would be SMALL.  
40

## 41 **Ecological Resources**

42  
43 SMALL. Most impacts on ecological resources would occur during preconstruction. The  
44 potential impacts associated with the construction, operation, and decommissioning of the  
45 proposed EREF would not occur. Revegetation of the proposed site could occur with renewal of  
46 some wildlife habitat. The land could revert to crop production and grazing activities. Impacts  
47 would be SMALL.  
48  
49

1 **Noise**

2  
3 SMALL. Under the no-action alternative, none of the noise impacts associated with proposed  
4 EREF construction, operation, or decommissioning would occur. Land uses on the proposed  
5 EREF site could revert to previous applications, livestock grazing and/or crop production, with  
6 concomitant noise levels and SMALL impacts.  
7

8 **Transportation**

9  
10 SMALL. Under the no-action alternative, traffic volumes and patterns would remain unchanged  
11 from existing conditions. The current volume of radioactive material and chemical shipments  
12 from other sources in the area would not increase. Impacts would be SMALL.  
13

14 **Public and Occupational Health**

15  
16 SMALL. Under the no-action alternative, health impacts from construction, operation, and  
17 decommissioning would not occur. Worker and public impacts from chemical and radioactive  
18 hazards would also not occur. Should the land be returned to grazing and agriculture, current  
19 use impacts would be expected and would be SMALL.  
20

21 **Waste Management**

22  
23 SMALL. Under the no-action alternative, no proposed EREF construction, operational, or  
24 decommissioning wastes (including sanitary, hazardous, low-level radioactive wastes, or mixed  
25 wastes) would be generated or require disposition. Impacts from waste management would be  
26 SMALL.  
27

28 **Socioeconomics**

29  
30 SMALL. Under the no-action alternative, any beneficial or adverse consequences of the  
31 proposed action would not occur. All socioeconomic conditions in the 11-county ROI would  
32 remain unchanged. Impacts would be SMALL.  
33

34 Population in the area surrounding the proposed EREF, in Bonneville and Bingham Counties, is  
35 expected to grow in accordance with current projections, with the total population in the region  
36 projected to be approximately 156,491 in 2013 and 168,331 in 2017. In association with  
37 population growth, the social characteristics of the region, including housing availability, school  
38 enrollment, and availability of law enforcement and firefighting resources, are expected to  
39 change over time. However, future changes in these characteristics are difficult to quantify, and  
40 no projections of their future growth are available.  
41

42 **Environmental Justice**

43  
44 SMALL. The no-action alternative would not be expected to cause any high and adverse  
45 impacts. It would not raise any environmental justice issues.  
46  
47

1 **Accidents**

2  
3 SMALL. Under the no-action alternative, potential accidents and accident consequences from  
4 operation of the proposed EREF would not occur. Impacts would be SMALL.  
5

6 **COSTS AND BENEFITS OF THE PROPOSED ACTION**

7  
8 While there are national energy security and fiscal benefits associated with the proposed action,  
9 and local socioeconomic benefits in the 11-county ROI in which the proposed EREF would be  
10 located, there are also direct costs associated with the preconstruction, construction, and  
11 operation phases of the proposed project, as well as impacts on various environmental  
12 resources. These impacts would mostly be SMALL, and in a few cases SMALL to MODERATE,  
13 or MODERATE in magnitude and small in comparison to the local and national benefits of the  
14 proposed action. In addition, most of the impacts to environmental resources associated with  
15 the proposed action would result from preconstruction activities at the proposed site, and would  
16 also occur under the no-action alternative. The principal socioeconomic impact or benefit of the  
17 proposed EREF project would be an increase in employment and income in the 11-county ROI.  
18 Although the majority of the costs, and most of the socioeconomic impacts, of the various  
19 phases of proposed EREF development would occur in the 11-county ROI, there would be  
20 economic, fiscal and, in particular, energy security benefits, which would occur at the local,  
21 State, and national levels.  
22

23 Average employment created in the 11-county ROI during the year of peak construction is  
24 estimated at 1687 full-time jobs, with \$0.7 million in State income tax revenues and \$5.1 million  
25 in State sales taxes. During the proposed EREF full operations phase beginning in 2022,  
26 3289 annual jobs would be created. During this period, the State of Idaho would benefit from  
27 \$1.3 million annually in income taxes, while Bonneville County would collect \$3.5 million  
28 annually in property tax receipts. Although it can be assumed that some portion of paid State  
29 sales and income taxes would be returned to the 11-county ROI under revenue-sharing  
30 arrangements between each county and the State government, the exact amount that would be  
31 received by each county cannot be determined. Although there are economic and fiscal  
32 benefits associated with the proposed action in the 11-county ROI, these impacts would be  
33 SMALL.  
34

35 The direct costs associated with the proposed action may be categorized by the following life-  
36 cycle stages: facility construction, operation, depleted uranium disposition, and  
37 decommissioning. In addition, costs would be incurred for preconstruction activities under both  
38 the proposed action and the no-action alternative. In addition to monetary costs, the proposed  
39 action would result in impacts on various resource areas, which are considered “costs” for the  
40 purpose of this analysis. The resource areas and corresponding impacts are described in detail  
41 in Chapter 4 of this EIS. As discussed earlier, the impacts of preconstruction and the proposed  
42 action would mostly be SMALL, and in a few cases SMALL to MODERATE, or MODERATE, for  
43 all resource areas.  
44

45 The proposed action could result in the maximum annual production of 6.6 million SWUs of  
46 enriched uranium in peak years, which would represent an augmentation of the domestic supply  
47 of enriched uranium and, along with other planned new enrichment facilities, would meet the  
48 need for increased domestic supplies of enriched uranium for national energy security. Thus,



1 the proposed action would generate national and regional benefits and costs. The national  
2 benefit would be an increase in domestic supplies of enriched uranium that would assist the  
3 national energy security need. The regional benefits would be increased employment,  
4 economic activity, and tax revenues in the 11-county ROI. Costs associated with the proposed  
5 project are, for the most part, limited to the resource areas in the 11-county ROI.  
6

## 7 **COMPARISON OF THE PROPOSED ACTION AND NO-ACTION ALTERNATIVE**

8

9 The impacts of the proposed action and the no-action alternative are briefly summarized and  
10 compared below. A more detailed summary and comparison is provided in Chapter 2,  
11 Table 2-6. As discussed earlier, it is assumed that the previously discussed preconstruction  
12 activities take place under both alternatives and, therefore, the impacts associated with  
13 preconstruction activities take place regardless of which alternative is selected. As a result, the  
14 comparison of alternatives presented below and in Chapter 2 is intended to highlight the  
15 differences between the two alternatives after preconstruction activities have occurred.  
16

17 Under the no-action alternative, the proposed EREF would not be constructed, operated, and  
18 decommissioned in Bonneville County, Idaho. The Paducah Gaseous Diffusion Plant in  
19 Paducah, Kentucky, the URENCO USA facility in Lea County, New Mexico, and the  
20 downblending of highly enriched uranium under the Megatons to Megawatts Program would  
21 remain the sole sources of domestically generated low-enriched uranium for U.S. commercial  
22 nuclear power plants. The URENCO USA facility is still under construction and with the ACP,  
23 which is currently under construction, may provide additional enrichment services in the future.  
24 The license application for an additional enrichment facility, the proposed GLE Facility, is  
25 currently under review by the NRC. Foreign enrichment sources would be expected to continue  
26 to supply approximately 85 percent of U.S. nuclear power plants' demand until new domestic  
27 enrichment facilities are constructed and operated.  
28

29 The no-action alternative would have SMALL impacts on land use, visual and scenic resources,  
30 air quality, geology and soils, water resources, ecological resources, noise, transportation,  
31 public and occupational health, waste management, socioeconomics, environmental justice,  
32 and facility accidents, and SMALL to MODERATE impacts on historic and cultural resources.  
33 The costs and benefits of constructing, operating, and decommissioning the proposed EREF  
34 would not occur. Additional domestic enrichment facilities could be constructed in the future  
35 with impacts expected to be SMALL to LARGE, depending on facility- and site-specific  
36 conditions.  
37

38 In comparison to the no-action alternative, the proposed action would also have SMALL impacts  
39 on land use, air quality, geology and soils, water resources, ecological resources, noise, public  
40 and occupational health, waste management, socioeconomics, and environmental justice, but  
41 would have SMALL to MODERATE impacts on historic and cultural resources, visual and scenic  
42 resources, transportation, and facility accidents. The proposed action would have positive  
43 impacts in the region on employment and income, and on State and Federal tax revenues.  
44

## 45 **CUMULATIVE IMPACTS**

46

47 This EIS also considers cumulative impacts that could result from the proposed action when  
48 added to other past, present, and reasonably foreseeable future actions (Federal, non-Federal,  
49 or private). No ongoing or planned developments were identified within 16 kilometers (10 miles)

1 of the proposed project location, which includes the ROI for all affected resource areas except  
2 socioeconomics, which extends to an 80.5-kilometer (50-mile) radius. Proposed developments  
3 within 80.5 kilometers (50 miles) that could contribute to a regional socioeconomic impact in  
4 combination with the proposed project include the proposed Mountain States Transmission  
5 Intertie, a proposed 500-kV electrical transmission line running between western Montana and  
6 southeastern Idaho. The preferred route lies approximately 40 kilometers (25 miles) to the west  
7 of the proposed EREF site, running north-south. Two other alternate routes lie closer, the  
8 nearest running adjacent to the western boundary of the proposed EREF property just outside  
9 of INL property, and the other route crossing US 20 about 10 miles east of the proposed EREF  
10 site. In addition, impacts from the construction of a proposed new 161-kV transmission line, a  
11 substation, and substation upgrades for the proposed EREF are addressed as cumulative  
12 impacts in this EIS, as this action is not under the NRC's jurisdiction and, therefore, not  
13 considered by the NRC to be part of the proposed action. In general, the anticipated cumulative  
14 impacts from the proposed action would be SMALL. Cumulative impacts associated with the  
15 no-action alternative would be generally less than those for the proposed action, except in terms  
16 of local job creation.

17

## 18 **SUMMARY OF ENVIRONMENTAL CONSEQUENCES**

19

20 Preconstruction activities and the proposed action would result in unavoidable adverse impacts  
21 on the environment. These impacts would mostly be SMALL and SMALL to MODERATE or  
22 MODERATE in a few cases, with the potential for temporary and brief LARGE impacts on air  
23 quality from fugitive dust, and would, in most cases, be mitigated. The area needed for  
24 construction and operation of the proposed EREF would be cleared of vegetation, which would  
25 lead to the displacement of some local wildlife populations. There would be temporary impacts  
26 from preconstruction and the construction of new facilities, including increased fugitive dust,  
27 increased potential for soil erosion and stormwater pollution, and increased vehicle traffic and  
28 emissions. Water consumption from onsite wells would be relatively small, and the risk for  
29 significant adverse impacts on neighboring residential wells or public supply wells would be  
30 SMALL. During operations, workers and members of the public could be exposed to radiation  
31 and chemicals, although the impacts of these exposures would be SMALL.

32

33 Preconstruction and the proposed action would necessitate short-term commitments of  
34 resources and would permanently commit certain other resources (such as energy and water).  
35 This EIS defines short-term uses as generally affecting the present quality of life for the public  
36 (i.e., the 30-year license period for the proposed EREF) and long-term productivity as affecting  
37 the quality of life for future generations on the basis of environmental sustainability. The short-  
38 term use of resources would result in potential long-term socioeconomic benefits to the local  
39 area and the region.

40

41 Workers, the public, and the environment would be exposed to increased amounts of hazardous  
42 and radioactive materials over the short term from operations of the proposed EREF.  
43 Construction and operation would require a long-term commitment of terrestrial resources, such  
44 as land, water, and energy. Short-term impacts would be minimized by the application of  
45 appropriate mitigation measures. Upon the closure of the proposed EREF, AES would  
46 decontaminate and decommission the buildings and equipment and restore them for  
47 unrestricted use. Continued employment, expenditures, and tax revenues generated during the  
48 proposed action would directly benefit the local, regional, and State economies.

49

1 Irreversible commitment of resources refers to resources that are destroyed and cannot be  
2 restored, whereas an irretrievable commitment of resources refers to material resources that  
3 once used cannot be recycled or restored for other uses by practical means. The proposed  
4 action would include the commitment of land, water, energy, raw materials, and other natural  
5 and human-generated resources. Following decommissioning, the land occupied by the  
6 proposed facility would likely remain industrial beyond license termination. Water required  
7 during preconstruction and the proposed action would be obtained from new and existing wells  
8 at the proposed EREF property and would be replenished through natural mechanisms.  
9 Wastewaters would be treated to meet applicable standards and would evaporate. Energy used  
10 in the form of electricity and diesel fuel would be supplied through new infrastructure connecting  
11 to existing systems in the Idaho Falls area. The specific types of construction materials and the  
12 quantities of energy and materials used cannot be determined until final facility design is  
13 completed, but it is not expected that these quantities would strain the availability of these  
14 resources.

15  
16 During operation of the proposed EREF, natural  $UF_6$  would be used as feed material, requiring  
17 the mining of uranium (not licensed by the NRC) and other front end operational steps in the  
18 uranium fuel cycle (licensed by the NRC). This use of uranium would be an irretrievable  
19 resource commitment.

20  
21 Even though the land used to construct the proposed EREF would be returned to other  
22 productive uses after the proposed facility is decommissioned, there would be some irreversible  
23 commitment of land at other offsite locations used to dispose of solid wastes generated by the  
24 proposed facility. In addition, wastes generated during the conversion of depleted  $UF_6$   
25 produced by the proposed facility and the depleted uranium oxide conversion product from the  
26 conversion of depleted  $UF_6$  would be disposed at a licensed offsite LLRW disposal facility. Land  
27 used for disposal of these materials would represent an irreversible commitment of land. No  
28 solid wastes or depleted uranium oxide conversion product originating from the proposed EREF  
29 would be disposed of on the proposed EREF property. When the proposed facility is  
30 decommissioned, some building materials would be recycled and reused. Other materials  
31 would be disposed of in a licensed and approved offsite location, and the amount of land used  
32 to dispose of these materials would be an irretrievable land resource.

33

## ACRONYMS AND ABBREVIATIONS

1		
2		
3	$^{234}\text{U}$	uranium-234 (U-234)
4	$^{235}\text{U}$	uranium-235 (U-235)
5	$^{235}\text{UF}_6$	uranium-235 hexafluoride
6	$^{238}\text{U}$	uranium-238 (U-238)
7	$^{238}\text{UF}_6$	uranium-238 hexafluoride
8		
9	AAC	acceptable ambient concentration
10	AASHTO	American Association of State Highway and Transportation Officials
11	ACHP	Advisory Council on Historic Preservation
12	ACP	American Centrifuge Plant
13	ADAMS	Agencywide Documents Access and Management System
14	AERMOD	AMS/EPA Regulatory Model
15	AES	AREVA Enrichment Services, LLC
16	ALARA	as low as reasonably achievable
17	ANSI	American National Standards Institute
18	APE	Area of Potential Effect
19	Argonne	Argonne National Laboratory
20	ASTM	American Society of Testing and Materials
21	ATSDR	Agency for Toxic Substances and Disease Registry
22	AVLIS	Atomic Vapor Laser Isotope Separation
23		
24	BEA	U.S. Bureau for Economic Analysis
25	BLM	U.S. Bureau of Land Management
26	BLS	U.S. Bureau of Labor Statistics
27	BMP	best management practice
28	BSPB	Blending, Sampling, and Preparation Building
29		
30	CAA	<i>Clean Air Act</i>
31	CAB	Centrifuge Assembly Building or Controlled Area Boundary
32	$\text{CaF}_2$	calcium fluoride
33	Cal/EPA	California Office of Environmental Health Hazard Assessment
34	CCS	Center for Climate Studies
35	CDC	Centers for Disease Control and Prevention
36	CEDE	committed effective dose equivalent
37	CEQ	Council on Environmental Quality
38	CFR	U.S. <i>Code of Federal Regulations</i>
39	$\text{CH}_4$	methane
40	CTF	Centrifuge Test Facility
41	CO	carbon monoxide
42	$\text{CO}_2$	carbon dioxide
43	CREP	Conservation Reserve Enhancement Program
44	CWA	<i>Clean Water Act</i>
45	CY	calendar year
46		
47	D&D	decontamination and decommissioning
48	DDT	dichlorodiphenyltrichloroethane

1	DEM	Digital Elevation Model
2	DNFSB	Defense Nuclear Facilities Safety Board
3	DNL	day/night average noise level
4	DOC	U.S. Department of Commerce
5	DOE	U.S. Department of Energy
6	DOEQAP	DOE Quality Assurance Program
7	DOL	U.S. Department of Labor, U.S. Bureau of Labor Statistics
8	DOT	U.S. Department of Transportation
9		
10	EA	Environmental Assessment
11	EDE	effective dose equivalent
12	EIA	Energy Information Administration
13	EIS	Environmental Impact Statement
14	EMP	Effluent Monitoring Program
15	EPA	U.S. Environmental Protection Agency
16	ER	Environmental Report
17	ERDA	Energy Research and Development Administration
18	EREF	Eagle Rock Enrichment Facility
19	ESA	<i>Endangered Species Act</i>
20	ESRP	Eastern Snake River Plain
21		
22	FBI	Federal Bureau of Investigation
23	FEMA	Federal Emergency Management Agency
24	FGR	Federal Guidance Report
25	FR	<i>Federal Register</i>
26	FTE	full-time equivalent
27	FWCA	<i>Fish and Wildlife Coordination Act</i>
28	FWS	U.S. Fish and Wildlife Service
29		
30	GAO	U.S. General Accounting Office
31	GCRP	U.S. Global Climate Change Research Program
32	GDP	Gaseous Diffusion Plant
33	GE	General Electric
34	GEVS	Gaseous Effluent Ventilation System
35	GHG	greenhouse gas
36	GLE	Global Laser Enrichment
37	GWP	Global Warming Potential
38		
39	HAP	hazardous air pollutant
40	HEPA	high-efficiency particulate air
41	HEU	high-enriched uranium
42	HF	hydrogen fluoride or hydrofluoric acid
43	HFC	hydrofluorocarbon
44	HPS	Health Physics Society
45	HRCQ	Highway Route Controlled Quantity
46	HVAC	heating, ventilating, and air conditioning
47	HUD	U.S. Department of Housing and Urban Development
48		
49		

1	I	Interstate
2	IAC	<i>Idaho Administrative Code</i>
3	ICRP	International Commission on Radiological Protection
4	IDAPA	<i>Idaho Administrative Procedures Act</i>
5	IDC	Idaho Department of Commerce
6	IDEQ	Idaho Department of Environmental Quality
7	IDFG	Idaho Department of Fish and Game
8	IDWR	Idaho Department of Water Resources
9	IGS	Idaho Geological Survey
10	INL	Idaho National Laboratory
11	IPCC	Intergovernmental Panel on Climate Change
12	IPCS	International Programme on Chemical Safety
13	IROFS	Items Relied on for Safety
14	IS	<i>Idaho Statutes</i>
15	ISA	Integrated Safety Analysis
16	ISAC	Idaho Sage-grouse Advisory Committee
17	ISACTAT	Idaho Sage-grouse Advisory Committee Technical Assistance Team
18	ISCORS	Interagency Steering Committee on Radiation Standards
19	ISTC	Idaho State Tax Commission
20	ITD	Idaho Transportation Department
21	IWRB	Idaho Water Resource Board
22		
23	LCF	latent cancer fatality
24	L <sub>dn</sub>	day/night maximum average sound level
25	L <sub>eq</sub>	equivalent sound level
26	LES	Louisiana Energy Services
27	LEU	low-enriched uranium
28	LLRW	low-level radioactive waste
29	LOS	level of service
30	LTTS	Low Temperature Take-off Stations
31	LWR	light water reactor
32		
33	MAPEP	Mixed Analyte Performance Evaluation Program
34	MCL	maximum contaminant level
35	MCNP	Monte Carlo N-Particle
36	MDC	minimum detectable concentration
37	MDEQ	Montana Department of Environmental Quality
38	MEI	maximally exposed individual
39	MFC	Materials and Fuels Complex
40	MLIS	molecular laser isotope separation
41	MOA	Memorandum of Agreement
42	MRI	Midwest Research Institute
43	MSL	mean sea level
44	MW(e)	Megawatt electric
45		
46	NAAQS	National Ambient Air Quality Standards
47	NCDC	National Climatic Data Center
48	NCES	National Center for Education Statistics



1	NCRP	National Council on Radiation Protection and Measurements
2	NEF	National Enrichment Facility
3	NELAC	National Environmental Laboratory Accreditation Conference
4	NELAP	National Environmental Laboratory Accreditation Program
5	NEPA	<i>National Environmental Policy Act of 1966</i>
6	NESHAP	National Emission Standards for Hazardous Air Pollutants
7	NHPA	<i>National Historic Preservation Act of 1966</i>
8	NIOSH	National Institute of Occupational Safety and Health
9	NIST	National Institute of Standards and Technology
10	NLCD 1992	National Land Cover Data 1992
11	NMFS	National Marine Fisheries Service
12	NMVOC	nonmethane volatile organic compound
13	NNL	National Natural Landmark
14	N <sub>2</sub> O	nitrous oxide
15	NO <sub>2</sub>	nitrogen dioxide
16	NOAA	National Oceanic and Atmospheric Administration
17	NOI	Notice of Intent
18	NO <sub>x</sub>	nitrogen oxides
19	NPCR	National Program of Cancer Registries
20	NPDES	National Pollutant Discharge Elimination System
21	NPS	National Park Service
22	NRC	U.S. Nuclear Regulatory Commission
23	NRCP	National Council on Radiation Protection
24	NRCS	U.S. Natural Resources Conservation Service
25	NRHP	<i>National Register of Historic Places</i>
26	NWS	National Weather Service
27		
28	O <sub>3</sub>	ozone
29	OECD	Organisation for Economic Co-operation and Development
30	OEL	occupational exposure levels
31	OSHA	Occupational Safety and Health Administration
32		
33	PAH	polycyclic aromatic hydrocarbon
34	Pb	lead
35	PCB	polychlorinated biphenyl
36	PFC	perfluorocarbon
37	PGA	peak ground acceleration
38	PM	particulate matter
39	PM <sub>2.5</sub>	particulate matter equal to or smaller than 2.5 micrometers in diameter
40	PM <sub>10</sub>	particulate matter equal to or smaller than 10 micrometers in diameter
41	PNNL	Pacific Northwest National Laboratory
42	PSD	Prevention of Significant Deterioration
43	PTE	Potential to Emit
44	PWR	pressurized water reactor
45		
46	RAB	Restricted Area Boundary
47	RAI	Request for Additional Information
48	RCRA	<i>Resource Conservation and Recovery Act</i>
49		

1	REMP	Radiological Environmental Monitoring Program
2	RMP	Rocky Mountain Power or range management plan
3	ROI	region of influence
4	ROW	right-of-way
5		
6	SAAQS	State Ambient Air Quality Standards
7	SARA	<i>Superfund Amendments and Reauthorization Act</i>
8	SBM	Separations Building Module
9	SDWA	<i>Safe Drinking Water Act</i>
10	SER	Safety Evaluation Report
11	SF <sub>6</sub>	sulfur hexafluoride
12	SHPO	State Historic Preservation Office(r)
13	SILEX	separation of isotopes by laser excitation
14	SMCL	secondary maximum contaminant level
15	SO <sub>2</sub>	sulfur dioxide
16	SPCC	Spill Prevention Control and Countermeasures
17	SPL	sound pressure level
18	SUNSI	Sensitive Unclassified Non-Safeguards Information
19	SVOC	semivolatile organic compound
20	SWPPP	Stormwater Pollution Prevention Plan
21	SWU	separative work unit
22		
23	TEDE	Total Effective Dose Equivalent
24	TI	transportation index
25	TLD	thermoluminescent dosimeter
26	TRAGIS	Transportation Routing Analysis Geographic Information System
27	TSB	Technical Support Building
28	TSDf	treatment, storage, and disposal facility
29		
30	U <sub>3</sub> O <sub>8</sub>	triuranium octaoxide
31	UO <sub>2</sub> F <sub>2</sub>	uranyl fluoride
32	UBC	uranium byproduct cylinder
33	UF <sub>4</sub>	uranium tetrafluoride
34	UF <sub>6</sub>	uranium hexafluoride
35	UN	United Nations
36	UNFCCC	United Nations Framework Convention on Climate Change
37	URENCO	URENCO Group
38	USACE	U.S. Army Corps of Engineers
39	U.S.C.	<i>United States Code</i>
40	USCB	U.S. Census Bureau
41	USDA	U.S. Department of Agriculture
42	USEC	U.S. Enrichment Corporation
43	USGS	U.S. Geological Survey
44	USSLWG	Upper Snake Sage-grouse Local Working Group
45		
46	VOC	volatile organic compound
47	VRI	visual resource inventory
48		



1	VRM	visual resource management
2	VTM	vehicle miles traveled
3		
4	WSA	Wilderness Study Area

1 **1 INTRODUCTION**

2  
3 **1.1 Background**

4  
5 The U.S. Nuclear Regulatory Commission (NRC) prepared this Environmental Impact  
6 Statement (EIS) in response to an application submitted by AREVA Enrichment Services, LLC  
7 (AES) for a license that would allow the construction, operation, and decommissioning of a gas  
8 centrifuge uranium enrichment facility near Idaho Falls in Bonneville County, Idaho (Figure 1-1).  
9 Revisions to the license application were submitted by AES on April 23, 2009 (Revision 1) and  
10 April 30, 2010 (Revision 2). The proposed facility is referred to as the Eagle Rock Enrichment  
11 Facility (EREF).  
12

13 The NRC’s Office of Federal and State Materials and Environmental Management Programs  
14 prepared this EIS as required by Title 10, “Energy,” of the U.S. *Code of Federal Regulations*  
15 (10 CFR) 51.20(b)(10). In particular, 10 CFR 51.20 (b)(10) states that issuance of a license for  
16 a uranium enrichment facility requires the NRC to prepare an EIS or a supplement to an EIS. |  
17 The NRC’s regulations under 10 CFR Part 51 implement the requirements of the *National*  
18 *Environmental Policy Act of 1969*, as amended (NEPA) (Public Law 91-190). The Act requires  
19 Federal agencies to assess the potential impacts of their actions affecting the quality of the  
20 human environment.  
21

22 **1.2 The Proposed Action**

23  
24 The proposed action is for AES to construct, operate, and decommission a gas centrifuge  
25 uranium enrichment facility near Idaho Falls, in Bonneville County, Idaho. If the NRC issues a  
26 license to AES under the provisions of the *Atomic Energy Act of 1954*, the license would  
27 authorize AES to possess and use special nuclear material, source material, and byproduct  
28 material at the proposed EREF for a period of 30 years, in accordance with the NRC’s  
29 regulations in 10 CFR Parts 70, 40, and 30, respectively. The scope of activities to be  
30 conducted under the license would include the construction, operation, and decommissioning of  
31 the proposed EREF.  
32

33 AES has proposed that the EREF be located on a 186-hectare (460-acre) section of a  
34 1700-hectare (4200-acre) parcel of land that it intends to purchase from a single private  
35 landowner. The only structure presently on the property is a potato storage facility at the south  
36 end of the site. Current land uses of the property include native rangeland, nonirrigated seeded  
37 pasture, and irrigated cropland.  
38

39 AES plans to conduct preconstruction and construction of the proposed EREF from 2010 to  
40 2022.<sup>1</sup> Partial facility operations will commence in 2014, with an 8-year startup period that  
41 would run concurrently with construction activities. The facility is expected to reach full  
42 production capacity in 2022. Decommissioning or potential license renewal activities would  
43 begin in advance of scheduled license expiration (anticipated to be 2041).  
44

---

<sup>1</sup> As discussed in Section 1.4.1, certain site preparation activities, referred to as “preconstruction” activities in this EIS, are explicitly excluded from the definition of construction in 10 CFR 51.4. Preconstruction activities are not considered part of the proposed action.

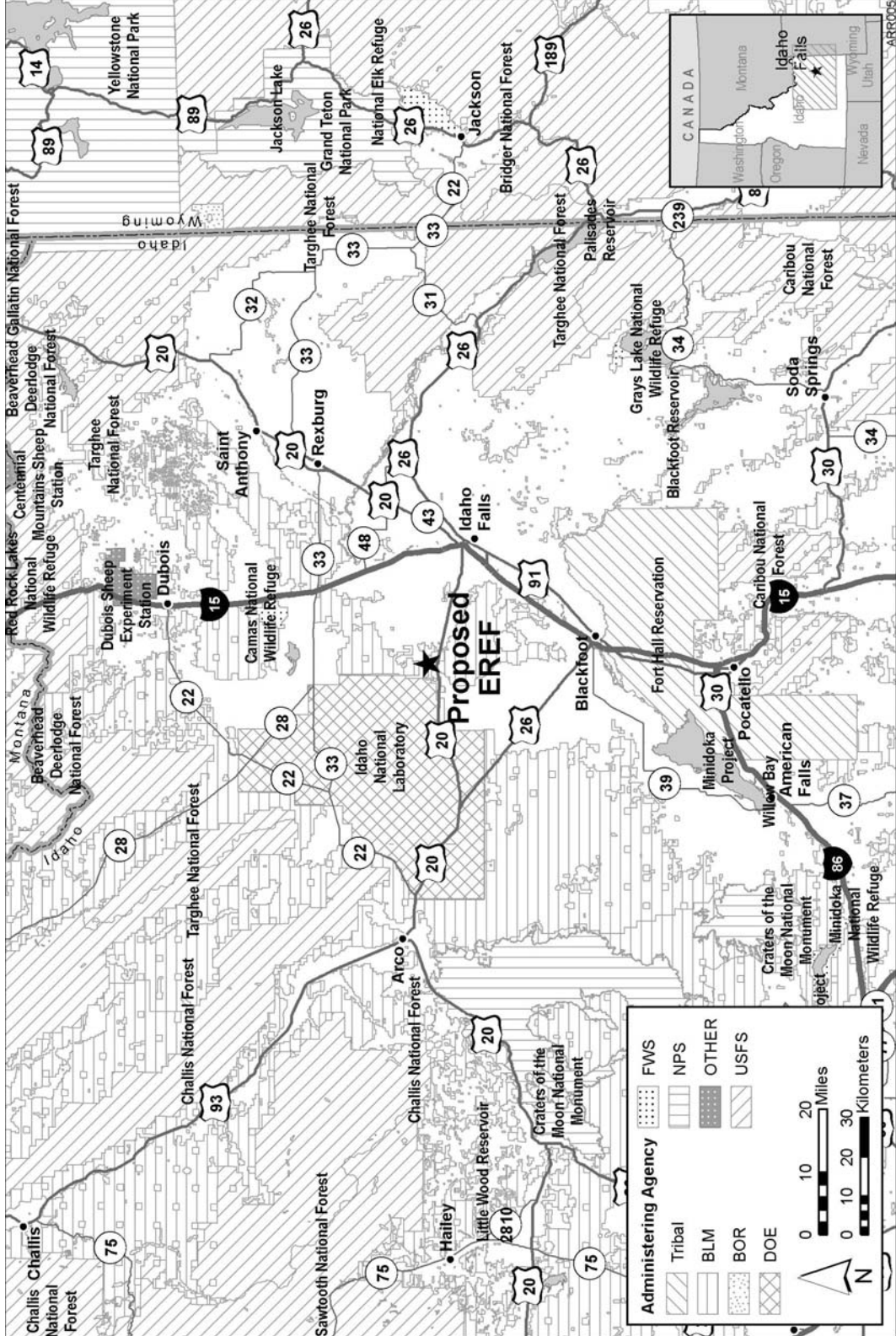


Figure 1-1 Location of the Proposed Eagle Rock Enrichment Facility (EREF)

1 AES intends that the proposed EREF would help fulfill needs for domestic enriched uranium  
2 capacity for nuclear electrical generation and contribute to national energy security (i.e., provide  
3 additional reliable and economical uranium enrichment capacity in the United States)  
4 (AES, 2010b). This purpose and need are discussed in detail in Section 1.3.  
5

6 Natural uranium ore usually contains approximately 0.72 weight percent uranium-235, and this  
7 percentage is significantly less than the 3 to 5 weight percent uranium-235 required by the  
8 nuclear power plants currently employed or proposed in the United States and in most other  
9 countries as fuel for electricity generation. Therefore, uranium must be enriched in one of the  
10 steps of the nuclear fuel cycle (Figure 1-2) so it can be used in commercial light-water nuclear  
11 power plants. Enrichment is the process of increasing the percentage of the naturally occurring  
12 and fissile uranium-235 isotope and decreasing the percentage of uranium-238.  
13

14 AES's license application seeks authorization to produce enriched uranium up to a nominal  
15 5 percent by weight of uranium-235, which meets the needs of most U.S. power plants.  
16 Enriched uranium from the proposed EREF would be used in commercial light-water nuclear  
17 power plants and is called low-enriched uranium (LEU). Uranium used in military reactors and  
18 nuclear weapons has a much higher percentage of uranium-235 by weight and is called highly  
19 enriched uranium (HEU).  
20

21 AES has requested a license for a nominal annual production capacity of 6 million separative  
22 work units (SWUs) per year and a maximum production capacity of 6.6 million SWUs<sup>2</sup> per year.  
23 An SWU represents the level of effort or energy required to raise the concentration of  
24 uranium-235 to a specified level.  
25

### 26 **1.3 Purpose and Need for the Proposed Action**

27

28 As discussed in Section 1.2, the proposed action is for AES to construct, operate, and  
29 decommission a facility to enrich uranium up to 5 percent by weight of uranium-235, with a  
30 nominal annual production capacity of 6 million SWUs and a maximum annual production  
31 capacity of 6.6 million SWUs. The proposed facility would use the gas centrifuge uranium  
32 enrichment process and would be constructed on an undeveloped site in Bonneville County,  
33 Idaho. The proposed action is intended to satisfy the need for an additional economical  
34 domestic source of enriched uranium.  
35

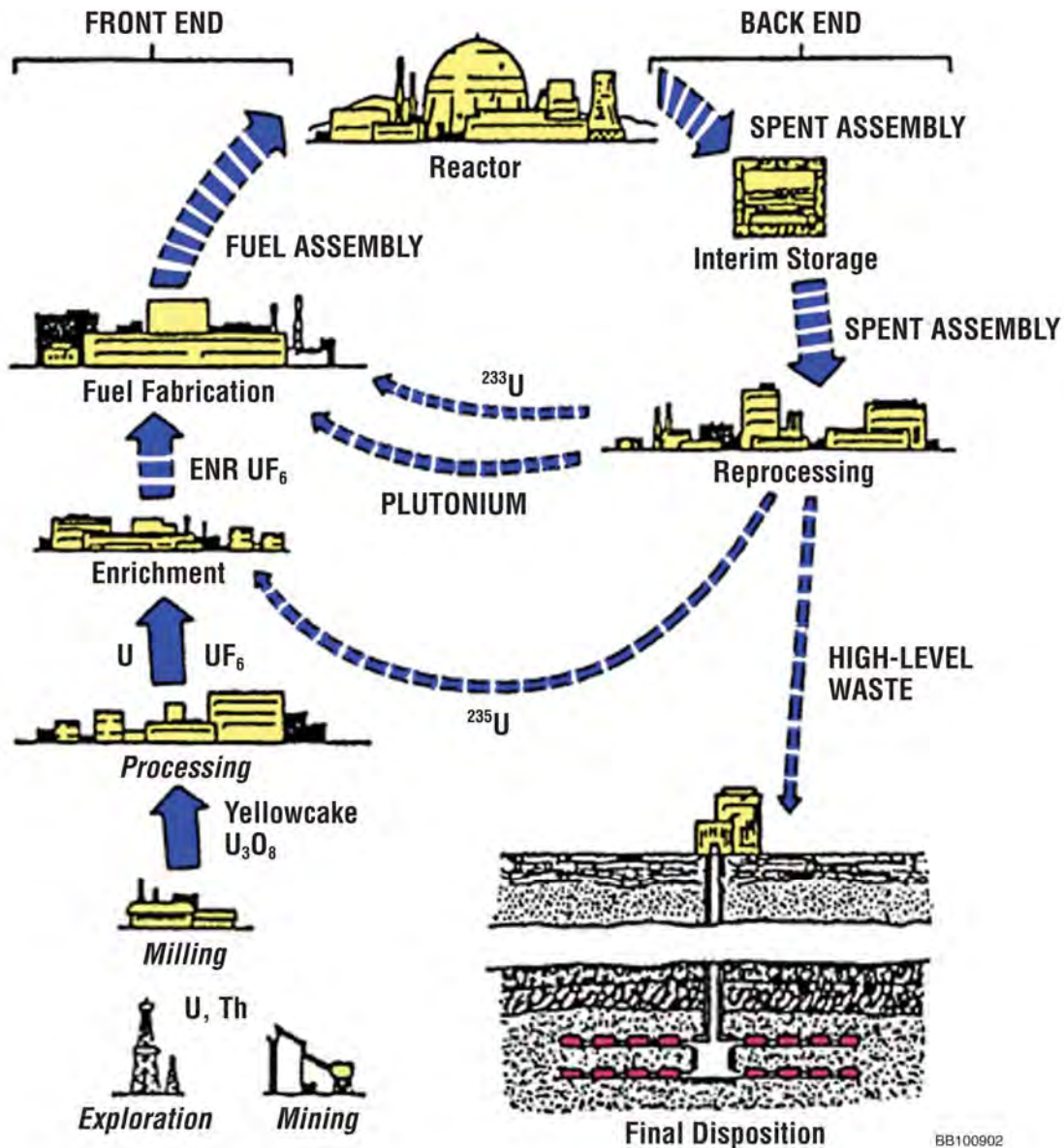
36 The purpose of the proposed action is to fulfill the following needs:  
37

- 38 • the need for enriched uranium to fulfill electricity generation requirements
- 39
- 40 • the need for domestic supplies of enriched uranium for national energy security

---

<sup>2</sup> An SWU is a unit of measurement used in the nuclear industry pertaining to the process of enriching uranium for use as fuel for nuclear power plants. It describes the effort needed to separate uranium-235 and uranium-238 atoms in natural uranium to create a final product that is richer in uranium-235 atoms. For 114 kilograms (251 pounds) of natural uranium, it takes about 70 SWUs to produce 10 kilograms (22 pounds) of uranium enriched to 5 percent uranium-235. It takes on the order of 100,000 SWUs of enriched uranium to fuel a typical 1000-megawatt commercial nuclear reactor for a year (USEC, 2009).





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11  
12  
13  
14

Figure 1-2 Nuclear Fuel Cycle (NRC, 2008)

The following sections discuss each of these needs and how each is addressed by the proposed action.

### 1.3.1 The Need for Enriched Uranium to Fulfill Electricity Requirements

Enriched uranium from the proposed EREF would be used in U.S. commercial nuclear power plants. According to the Energy Information Administration (EIA) in its *Annual Energy Outlook 2010 with Projections to 2035* (EIA, 2010a), these plants currently supply approximately 20 percent of the nation's electricity requirements. As future demand for electricity increases, the need for LEU to fuel nuclear power plants is also expected to increase (EIA, 2010a).

1 For the case based on established policies and current trends (the reference case), the EIA  
2 estimates that nuclear capacity grows from 100,600 megawatts in 2008 to 112,900 megawatts  
3 in 2035, including 4000 megawatts of expansion at existing plants and 8400 megawatts of new  
4 capacity (EIA, 2010a). Also, the EIA estimates that nuclear generation will grow from 806 billion  
5 kilowatt hours in 2008 to between 882 and 951 billion kilowatt hours in 2035, depending on the  
6 low- or high-growth scenarios.

7  
8 The NRC expects to license the next generation of nuclear power plants using 10 CFR Part 52.  
9 Part 52 governs the issuance of standard design certifications (DCs), early site permits (ESPs),  
10 and combined licenses (COLs) for nuclear power plants. The NRC staff is engaged in  
11 numerous ongoing interactions with vendors and utilities regarding prospective new reactor  
12 applications and licensing activities. Based on these interactions, the NRC staff has received a  
13 significant number of new reactor COL applications (COLAs) since 2007. As of December  
14 2010, the NRC is actively reviewing 12 COLAs for a total of 20 nuclear reactor units. The NRC  
15 has suspended 6 COLA reviews due to changes in applicants' business strategies or the timing  
16 of their construction plans. One of the suspended COLAs was converted by the applicant to an  
17 ESP application. Assuming licensing requirements are met, the NRC is poised to issue two  
18 COLs by the end of 2011.

19  
20 The NRC has three DC applications and two DC amendment applications currently under  
21 review. As of December 2010, one DC application and one DC amendment are in rulemaking.  
22 The NRC received two Advanced Boiling Water Reactor (ABWR) DC renewal requests in  
23 calendar year 2010 and expects to receive one new DC application by FY2012.

24  
25 The EIA forecasts of nuclear generating capacity combined with applications from the nuclear  
26 power industry for construction and operation of new plants suggest a continuing, if not  
27 increasing, demand for LEU. In addition, the EIA forecasts that the annual demand for  
28 enrichment services may vary between 12.9 million and 15.7 million SWUs from 2006 through  
29 2025 (EIA, 2003).

30  
31 The demand for enriched uranium in the United States is currently being fulfilled by three main  
32 categories of supply:

- 33
- 34 • *Domestic production of enriched uranium provides about 15 percent of U.S. demand*  
35 (EIA, 2010b). The primary uranium enrichment facility currently operating in the  
36 United States is the Paducah Gaseous Diffusion Plant (PGDP) in Paducah, Kentucky, run  
37 by USEC Inc.'s subsidiary, the United States Enrichment Corporation. A similar existing  
38 enrichment facility in the United States is the Portsmouth Gaseous Diffusion Plant in  
39 Piketon, Ohio, but it ceased production in May 2001 and will no longer produce enriched  
40 uranium, as the plant has been placed in cold shutdown (a condition whereby the plant is  
41 undergoing preparation for decommissioning and decontamination) (DOE, 2010a). The  
42 URENCO USA facility (formerly known as the National Enrichment Facility [NEF]) in Lea  
43 County, New Mexico, operated by Louisiana Energy Services LLC (LES), began initial  
44 operations in June 2010. This facility, which is still under construction and will continue to  
45 increase production as its remaining cascade halls are completed, is expected to reach a  
46 capacity of about 1.6 million SWUs per year in August 2011 (about half of its full capacity of  
47 approximately 3 million SWUs per year, as currently licensed by the NRC). Full licensed  
48 capacity would not be reached until sometime later. An expansion to 5.9 million SWUs per

1 year is being considered by LES, but an application for the expansion has not yet been  
2 submitted to the NRC.

- 3  
4 • *The Megatons to Megawatts Program provides about 38 percent of U.S. demand*  
5 (EIA, 2010b). Under this program, the United States Enrichment Corporation implements  
6 the 1993 government-to-government agreement between the United States and Russia that  
7 calls for Russia to convert 500 metric tons (550 tons) of HEU from dismantled nuclear  
8 warheads into LEU (DOE, 2010b). This is equivalent to about 20,000 nuclear warheads.  
9 The United States Enrichment Corporation purchases the enriched portion of the  
10 “downblended” material, tests it to make sure it meets specifications, adjusts the enrichment  
11 level if needed, and then sells it to its electric power generation customers for fuel in  
12 commercial nuclear power plants. All program activities in the United States now take place  
13 at the Paducah plant (NRC, 2006). This program is scheduled to expire in 2013  
14 (DOE, 2010b).
- 15  
16 • *Other foreign sources provide about 47 percent of U.S. demand.* Other countries that  
17 produce and export enriched uranium to the United States include China, France, Germany,  
18 the Netherlands, and the United Kingdom (EIA, 2010b).

19  
20 The current 5-year average U.S. demand for enriched uranium is approximately 14 million  
21 SWUs per year (EIA, 2010b). As noted, recent forecasts indicate that this demand could reach  
22 15 to 16 million SWUs by 2025, depending on the rate of nuclear generation growth in the  
23 United States (EIA, 2003). From 2005 through 2009, the United States Enrichment Corporation  
24 delivered approximately 10 to 13 million SWUs to customers annually, of which 5.5 million  
25 SWUs per year were from the Megatons to Megawatts Program. Of the remaining 4.5 to  
26 7.5 million SWUs, an average of approximately 2 million SWUs were sold for use in the  
27 United States and the balance exported (USEC, 2010). Therefore, of the amount sold for use in  
28 the United States from 2005 to 2009, approximately 2 million SWUs (about 15 percent of U.S.  
29 demand) came from enrichment at the PGDP and 5.5 million SWUs (about 38 percent of  
30 U.S. demand) came from downblending at the Megatons to Megawatts Program, which  
31 depends on deliveries from Russia (EIA, 2010b; USEC, 2010). Accordingly, about 85 percent  
32 (38 percent from the Megatons to Megawatts Program plus 47 percent from other foreign  
33 sources) of U.S. demand is currently supplied by foreign sources.

34  
35 It is anticipated that all gaseous diffusion enrichment operations in the United States will cease  
36 to exist in the near future due to the higher cost of aging facilities (DOE, 2007). The Megatons  
37 to Megawatts Program is scheduled to expire in 2013 (DOE, 2010b). As noted, these two  
38 sources meet about half (53 percent) of the current U.S. demand for LEU.

39  
40 To help fill the anticipated supply deficit, other potential future domestic sources of supply have  
41 emerged in recent years. In addition to the URENCO USA facility mentioned above, the USEC  
42 American Centrifuge Plant (ACP) in Piketon, Ohio, has received a license from the NRC  
43 (NRC, 2005, 2006) and is currently under construction. The NRC is currently reviewing a  
44 license application submitted by GE-Hitachi Global Laser Enrichment, LLC (GE-Hitachi) to  
45 construct and operate the proposed Global Laser Enrichment (GLE) Facility in Wilmington,  
46 North Carolina (GE-Hitachi, 2009). The URENCO USA facility and ACP are based on the  
47 gaseous centrifuge technology, while the GLE Facility is based on a newer, laser enrichment  
48 process under development. LES has announced a potential plan to expand the annual

1 capacity of its URENCO USA facility in New Mexico from 3 million to 5.9 million SWUs per year  
2 in response to customer expressions of the need for additional enrichment services  
3 (URENCO, 2008). However, as noted above, the URENCO USA facility, although currently  
4 operating, is still under construction and is not expected to reach half of its currently licensed  
5 annual capacity of 3 million SWUs per year until August 2011. ACP is licensed to produce  
6 3.5 million SWUs annually. The GE-Hitachi application is for a 6-million-SWU-per-year plant.  
7 Based on the projected need for LEU by existing reactors and proposed new reactors, with the  
8 target capacity of 6.6 million SWUs per year for the proposed EREF (this EIS), the total  
9 projected enrichment capacity in the United States would exceed the projected demand  
10 (approximately 16 million SWUs per year) by about 6 million SWUs per year if all of the  
11 enrichment facilities were constructed and operated at their rated capacities (and assuming the  
12 URENCO USA facility is authorized to operate at 5.9 million SWUs and the Paducah Gaseous  
13 Diffusion Plant is shut down). However, given the uncertainties in future development and/or  
14 potential expansion of the proposed projects, this projected level of extra capacity would not  
15 provide the needed assurance that the enriched uranium would be reliably available when  
16 needed for domestic nuclear power production.  
17

### 18 **1.3.2 The Need for Domestic Supplies of Enriched Uranium for National Energy Security**

19  
20 All of the current domestic production of enriched uranium currently originates primarily from the  
21 aging gaseous diffusion plant in Paducah, Kentucky, and to a lesser extent from the URENCO  
22 USA facility in Lea County, New Mexico, that began initial operations in June 2010 and is still  
23 under construction. This situation creates a severe reliability risk in U.S. domestic enrichment  
24 capacity. Any disruption in the supply of enriched uranium for domestic commercial nuclear  
25 reactors could have a detrimental impact on national energy security because nuclear reactors  
26 supply approximately 20 percent of the nation's electricity requirements. The proposed EREF  
27 could play an important role in assuring the nation's ability to maintain a reliable and economical  
28 domestic source of enriched uranium by providing such additional enrichment capacity. Further,  
29 this additional capacity would lessen U.S. dependence on foreign sources of enriched uranium.  
30

31 In a letter to the NRC regarding general policy issues raised by the LES license application, the  
32 U.S. Department of Energy (DOE) stated that uranium enrichment is a critical step in the  
33 production of nuclear fuel and noted the decline in domestic enrichment capacity (DOE, 2002).  
34 In its 2002 letter, DOE also referenced comments made by the U.S. Department of State  
35 indicating that "maintaining a reliable and economical U.S. uranium enrichment industry is an  
36 important U.S. energy security objective" (DOE, 2002). The proposed EREF could contribute to  
37 the attainment of national energy security policy objectives by providing an additional domestic  
38 source of enriched uranium. This additional capacity would lessen U.S. dependence on foreign  
39 sources of enriched uranium.  
40

41 At present, gaseous diffusion is the primary technology currently in commercial use in the  
42 United States. Gaseous diffusion technology has relatively large resource requirements that  
43 make it less attractive than gas centrifuge technology, from both an economic and an  
44 environmental perspective (NRC, 2006). Gas centrifuge technology, used at the URENCO USA  
45 facility, proposed for the EREF, and to be used at the ACP, is known to be more efficient and  
46 substantially less energy-intensive than gaseous diffusion technology. The new laser  
47 enrichment technology proposed for the GLE Facility is still under development.  
48



1 **1.4 Scope of the Environmental Analysis**  
2

3 To fulfill its responsibilities under NEPA, the NRC has prepared this EIS to analyze the  
4 environmental impacts (i.e., direct, indirect, and cumulative impacts) of the proposed EREF as  
5 well as reasonable alternatives to the proposed action. The scope of this EIS includes  
6 consideration of both radiological and nonradiological impacts associated with the proposed  
7 action and the reasonable alternatives.  
8

9 In addition, this EIS identifies resource uses, monitoring programs, potential mitigation  
10 measures, unavoidable adverse environmental impacts, the relationship between short-term  
11 uses of the environment and long-term productivity, and irreversible and irretrievable  
12 commitments of resources.  
13

14 The development of this EIS was based on (1) the NRC staff's review of the AES license  
15 application (AES, 2010a), which includes a supporting Environmental Report, AES's responses  
16 to Requests for Additional Information (RAIs) (AES, 2009b), and subsequent sage-grouse  
17 survey (North Wind, 2010a) and supplemental wildlife survey report submittals (North  
18 Wind, 2010b); (2) the NRC staff's review of additional information provided by AES and its  
19 consultants in recent letters to and from State agencies (AES, 2010c; Idaho SHPO, 2010;  
20 WCRM, 2010); (3) the NRC staff's independent verification and analyses; (4) public and agency  
21 comments received during the scoping period and the Draft EIS public comment period; and  
22 (5) the NRC staff's consultations with other Federal agencies and with Native American tribes  
23 and State and local government agencies. In addition, the development of this EIS was closely  
24 coordinated with the development of the NRC's Safety Evaluation Report (SER) (*Safety*  
25 *Evaluation Report for the Eagle Rock Enrichment Facility in Bonneville County, Idaho*, NUREG-  
26 1951, September 2010 [NRC, 2010a]), which is the outcome of the NRC safety review of the  
27 AES license application for the proposed EREF.  
28

29 **1.4.1 Scope of the Proposed Action**  
30

31 The scope of the proposed action consists of the construction, operation, and decommissioning  
32 of the proposed EREF. Therefore, all activities associated with these actions must be  
33 considered. Construction activities consist of site preparation (e.g., clearing the land and  
34 construction of access roads) and facility construction (erection of the buildings and structures  
35 concerned with uranium enrichment). A distinction between site preparation and facility  
36 construction is made because of an exemption request submitted by AES as discussed below.  
37 Operation activities include those involved in the enrichment of uranium (shipment, receipt,  
38 storage, and processing of natural uranium and storage and shipment of enriched and depleted  
39 uranium). Decommissioning activities include those involved in facility shutdown such as  
40 equipment and building decontamination for disposal or reuse.  
41

42 On June 17, 2009, AES submitted a request for exemption (AES, 2009a) from specific NRC  
43 requirements governing "Commencement of Construction" as specified under 10 CFR 70.4,  
44 70.23(a)(7), 30.4, 30.33(a)(5), 40.4, and 40.32(e). This exemption was approved by the NRC  
45 on March 17, 2010 (NRC, 2010b). The exemption allows AES to proceed with certain activities  
46 that are considered outside of NRC regulatory purview (they are not related to radiological  
47 health and safety or the common defense and security) before obtaining an NRC license to  
48 construct and operate the proposed EREF (the proposed action). These activities, discussed

1 further in Section 2.1.4.1, are referred to as “preconstruction” activities, because they are not  
2 considered construction activities as defined in NRC regulations. See 10 CFR 51.4 (defining  
3 “construction”) and 10 CFR 70.4 (defining “commencement of construction”); also compare  
4 10 CFR 50.2 (defining “construction” and “constructing”) and the NRC’s *Final Interim Staff*  
5 *Guidance COL/ESP-ISG-004 on the Definition of Construction and on Limited Work*  
6 *Authorizations* (NRC, 2009). Specifically, 10 CFR 51.4 states, in relevant part, that  
7 “construction” does not include the following activities:

- 8
- 9 i. Changes for temporary use of the land for public recreational purposes;
- 10
- 11 ii. Site exploration, including necessary borings to determine foundation conditions or other  
12 preconstruction monitoring to establish background information related to the suitability  
13 of the site, the environmental impacts of construction or operation, or the protection of  
14 environmental values;
- 15
- 16 iii. Preparation of a site for construction of a facility, including clearing of the site, grading,  
17 installation of drainage, erosion and other environmental mitigation measures, and  
18 construction of temporary roads and borrow areas;
- 19
- 20 iv. Erection of fences and other access control measures;
- 21
- 22 v. Excavation;
- 23
- 24 vi. Erection of support buildings (such as, construction equipment storage sheds,  
25 warehouse and shop facilities, utilities, concrete mixing plants, docking and unloading  
26 facilities, and office buildings) for use in connection with the construction of the facility;
- 27
- 28 vii. Building of service facilities, such as paved roads, parking lots, railroad spurs, exterior  
29 utility and lighting systems, potable water systems, sanitary sewerage treatment  
30 facilities, and transmission lines;
- 31
- 32 viii. Procurement or fabrication of components or portions of the proposed facility occurring  
33 at other than the final, in-place location at the facility;
- 34
- 35 ix. Manufacture of a nuclear power reactor under a manufacturing license under subpart F  
36 of part 52 of this chapter to be installed at the proposed site and to be part of the  
37 proposed facility; or
- 38
- 39 x. With respect to production or utilization facilities, other than testing facilities and nuclear  
40 power plants, required to be licensed under Section 104.a or Section 104.c of the Act,  
41 the erection of buildings which will be used for activities other than operation of a facility  
42 and which may also be used to house a facility (e.g., the construction of a college  
43 laboratory building with space for installation of a training reactor).
- 44

45 As indicated in (iii) of the list above, site preparation is one component of preconstruction. As  
46 used in this document, the term “site preparation” includes the items specifically listed in (iii)  
47 above (i.e., clearing of the site, grading, installation of drainage, erosion and other  
48 environmental mitigation measures, and construction of temporary roads and borrow areas).

1 The NRC's decision to grant the exemption request to AES was based on the NRC staff finding  
2 that the request to perform certain preconstruction activities is authorized by law, will not  
3 endanger life or property or common defense and security, and is in the public interest. The  
4 exemption covered the following activities and facilities:

- 5
- 6 • clearing of approximately 240 hectares (592 acres)
- 7
- 8 • site grading and erosion control
- 9
- 10 • excavating the site including rock blasting and removal
- 11
- 12 • constructing a stormwater retention pond
- 13
- 14 • constructing main access and site roadways
- 15
- 16 • installing utilities
- 17
- 18 • erecting fences for investment protection
- 19
- 20 • constructing parking areas
- 21
- 22 • erecting construction buildings, offices (including construction trailers), warehouses, and  
23 guardhouses
- 24

25 The authorization to conduct these listed activities or construct the listed facilities prior to the  
26 NRC licensing decision was based on the condition that none of the facilities or activities subject  
27 to the exemption will be, at a later date, a component of AES's Physical Security Plan or its  
28 Standard Practice Procedures Plan for the Protection of Classified Matter or otherwise subject  
29 to NRC review or approval. Approval of the exemption request does not indicate that a  
30 licensing decision has been made by the NRC. Preconstruction activities would be completed  
31 by AES with the risk that a license may not be issued. Although the activities covered by the  
32 NRC's March 17, 2010, exemption (NRC, 2010b) are referred to in this document as  
33 "preconstruction" activities, some of these activities may continue after the commencement of  
34 construction, if a license is issued.

35

36 These activities authorized under the exemption approval are expected to occur whether or not  
37 the license is granted. As a result, the NRC does not consider these activities as part of the  
38 proposed action or the no-action alternative. However, because they are related to the  
39 construction of the proposed EREF, NRC staff analyzed their impacts in Chapter 4 as part of the  
40 impacts considered under "Preconstruction and Construction." However, the staff also  
41 attempted, to the extent possible, to separate the impacts from preconstruction and construction  
42 activities into those that would occur as a result of preconstruction activities and those that  
43 would occur as a result of construction activities as defined in 10 CFR 50.2 and 10 CFR 51.4.  
44 The staff also considered all of these impacts in evaluating the cumulative impacts of the EREF  
45 project.

46

47 Further, the NRC has no regulatory jurisdiction over the 161-kilovolt (kV) electrical transmission  
48 line that is required to power the EREF (its installation and operation are not related to

1 radiological health and safety or the common defense and security). Therefore, the installation  
2 and operation of this transmission line is not considered by the NRC to be part of the proposed  
3 action. The installation and operation of this transmission line is considered under cumulative  
4 impacts in Chapter 4 of this EIS.  
5

#### 6 **1.4.2 Scoping Process and Public Participation Activities**

7

8 The NRC regulations in 10 CFR Part 51 contain requirements for conducting a scoping process  
9 prior to the preparation of an EIS. Scoping was used to help identify the relevant issues to be  
10 discussed in detail in this EIS. Scoping was also used to help determine issues that are beyond  
11 the scope of this EIS, which do not warrant a detailed discussion, or that are not directly  
12 relevant to the assessment of potential impacts from the proposed action.  
13

14 On May 4, 2009, the NRC published in the *Federal Register* (74 FR 20508) a Notice of Intent  
15 (NOI) to prepare an EIS for the construction, operation, and decommissioning of the proposed  
16 EREF and to conduct the scoping process for the EIS. The NOI summarized the NRC's plans  
17 to prepare the EIS and presented background information on the proposed EREF. For the  
18 scoping process, the NOI initiated the public scoping period and invited comments on the  
19 proposed action, and announced a public scoping meeting to be held concerning the project.  
20

21 On June 4, 2009, the NRC staff held the public scoping meeting in Idaho Falls, Idaho. During  
22 this meeting, a number of individuals offered oral and written comments and suggestions to the  
23 NRC concerning the proposed EREF and the development of the EIS. In addition, the NRC  
24 received written comments from various individuals during the public scoping period that ended  
25 on June 19, 2009. The NRC carefully reviewed the scoping comments (both oral and written)  
26 and then consolidated and categorized these comments by topical areas.  
27

28 After the scoping period, the NRC issued the *Environmental Scoping Summary Report:*  
29 *Proposed AREVA Enrichment Services Eagle Rock Enrichment Facility in Bonneville County,*  
30 *Idaho* in September 2009. This report is provided in Appendix A. The report identifies  
31 categories of issues to be analyzed in detail in the EIS and issues determined to be beyond the  
32 scope of the EIS.  
33

#### 34 **1.4.3 Issues Studied in Detail**

35

36 As stated in the NOI, the NRC identified issues to be studied in detail as they relate to  
37 implementation of the proposed action. The public identified additional issues during the  
38 subsequent public scoping process. Issues identified by the NRC and the public that could  
39 have short- or long-term impacts from the potential construction and operation of the proposed  
40 EREF include:

- 41
- 42 • accidents
  - 43 • alternatives
  - 44 • air quality
  - 45 • compliance with applicable regulations
  - 46 • costs and benefits
  - 47 • cumulative impacts
  - 48 • decommissioning
  - historic and cultural resources
  - land use
  - need for the facility
  - noise
  - public and occupational health
  - resource commitments
  - socioeconomic impacts

- depleted uranium disposition
- ecological resources
- environmental justice
- geology and soils
- transportation
- visual and scenic resources
- waste management
- water resources

#### 1.4.4 Issues Eliminated from Detailed Study

The NRC has determined that detailed analysis associated with mineral resources was not necessary because there are no known nonpetroleum mineral resources at the proposed site that would be affected by any of the alternatives being considered.

The NRC also determined that detailed analysis of the impact of the proposed EREF on associated actions that include the overall nuclear fuel cycle activities was not necessary. This is because the proposed project would not measurably affect uranium mining and milling operations and the demand for enriched uranium. The amount of mining and milling depends upon the stability of market prices for uranium balanced with the concern of environmental impacts associated with such operations (NRC, 1980). The demand for enriched uranium in the United States is primarily driven by the number of commercial nuclear power plants and their operation. The proposed EREF would only result in the creation of new transportation routes within the fuel cycle to and from the enrichment facility. The existing transportation routes between the other facilities are not expected to be altered. Because the environmental impacts of all of the transportation routes other than those to and from the proposed EREF have been previously analyzed, they are eliminated from further study (NRC, 1977, 1980).

#### 1.4.5 Issues Outside the Scope of the EIS

The following issues raised during the scoping process have been determined to be outside the scope of this EIS:

- safety and security
- credibility of the applicant
- nonproliferation

As noted in Section 1.4, some of these issues are analyzed in detail in the NRC's SER (NRC, 2010a) and are only summarized in the EIS. For example, within the area of safety and security, the SER analyzes the probabilities and consequences of various accidents at the proposed EREF, as well as measures to prevent those accidents and mitigate their effects. This EIS does not go into the same level of detail, but provides, in Section 4.2.15, an accident analysis for the purpose of assessing the potential environmental impacts of accidents.

NRC regulations require that information submitted as part of a license application be complete and accurate in all material respects. See, e.g., 10 CFR 70.9. At the same time, the general credibility of an applicant is not an issue the NRC addresses in an EIS. Rather, the NRC evaluates the submitted application based on its merits and performs an independent verification of the proposal put forth in the applicant's application.



1 The issue of nonproliferation was most recently addressed by the NRC in an August 25, 2010,  
2 letter from NRC Chairman Gregory B. Jaczko to the Honorable John M. Spratt, Jr.,  
3 Congressman, U.S. House of Representatives (NRC, 2010c). This letter was in response to  
4 Congressman Spratt's June 30, 2010, letter (Spratt et al., 2010) in which he requested that the  
5 NRC conduct a nuclear nonproliferation assessment as part of the review of license applications  
6 for new nuclear technologies. The relevant statements from Chairman Jaczko's letter are as  
7 follows:

8  
9 *"The NRC has adopted a comprehensive regulatory infrastructure and implements an*  
10 *integrated set of activities directed against the unauthorized disclosure of information*  
11 *and technology considered important to common defense and security and the diversion*  
12 *of nuclear materials inimical to public health and safety and the common defense and*  
13 *security. The NRC's key regulations in this area (10 CFR Parts 73, 74, and 95) provide*  
14 *comprehensive requirements governing the control of, and access to, information,*  
15 *physical security of materials and facilities, and material control and accounting. Other*  
16 *NRC regulatory requirements are directed at preventing unauthorized disclosure of*  
17 *classified information, safeguards information (SGI), and sensitive unclassified*  
18 *nonsafeguards information. As appropriate, the NRC may supplement these*  
19 *requirements by order consistent with its statutory obligation to protect the common*  
20 *defense and security and public health and safety.*

21  
22 *"Beyond the NRC's regulations, uranium enrichment facility licensees have voluntarily*  
23 *committed to implement additional measures to protect information associated with*  
24 *classified enrichment technologies. The Nuclear Energy Institute developed a guidance*  
25 *document for the enrichment facility licensees and certificate holders which the NRC*  
26 *staff has endorsed. Licensees are now implementing these additional measures and*  
27 *incorporating their commitments in their site security plans. These additional measures*  
28 *and commitments become part of their licensing basis. In addition, the staff is working*  
29 *with other agencies to provide additional Federal involvement in protecting uranium*  
30 *enrichment technologies and establishing information protection measures.*

31  
32 *"Given the NRC's comprehensive regulatory framework, ongoing oversight, and active*  
33 *interagency cooperation, it is the NRC's current view that a formal nuclear*  
34 *nonproliferation assessment would not provide any additional benefit to protection of the*  
35 *common defense and security....*

36  
37 *"I want to assure you that the NRC takes your concerns very seriously and that we will*  
38 *continue to regulate nuclear materials and sensitive technology to ensure protection of*  
39 *public health and safety and the environment, promotion of the common defense and*  
40 *security, and fulfillment of U.S. obligations for nonproliferation and international*  
41 *agreements."*

42  
43 Nonproliferation is therefore outside the scope of the EIS.  
44  
45  
46

1 **1.4.6 Draft EIS Public Comment Period and Public Participation Activities**  
2

3 The NRC staff issued the Draft EIS for public review and comment on July 21, 2010, and  
4 announced its availability on that date in the *Federal Register* (75 FR 4266) in accordance with  
5 10 CFR 51.73, 51.74, and 51.117. The official public comment period on the Draft EIS began  
6 with publication in the *Federal Register* on July 23, 2010, of a Notice of Availability of the Draft  
7 EIS (75 FR 43160). The 45-day public comment period ended on September 13, 2010.  
8

9 During the public comment period, the NRC staff held two public comment meetings – in Boise,  
10 Idaho, on August 9, 2010, and in Idaho Falls, Idaho, on August 12, 2010. The NRC staff posted  
11 meeting notices for both meetings in the NRC’s public involvement website. Oral comments on  
12 the Draft EIS were presented by about 50 people at the Boise meeting and about 46 people at  
13 the Idaho Falls meeting. A court reporter recorded the oral comments and other meeting  
14 proceedings and prepared a written transcript for each meeting. In addition to oral comments  
15 received at the public meetings, the NRC staff received written comments on the Draft EIS  
16 during the public meetings, and written comments by postal mail and emails during the public  
17 comment period. The public meeting transcripts and written comments are part of the public  
18 record for the proposed EREF project.  
19

20 All the comments received by the NRC on the Draft EIS were reviewed and considered by the  
21 NRC staff in developing the Final EIS. In Appendix I of this EIS, these comments are presented  
22 in groups by topic and summarized, and the NRC’s responses to the comments are provided.  
23 The NRC staff made the public comment meeting transcripts part of the public record, contained  
24 in the NRC’s Agencywide Documents Access and Management System (ADAMS). The  
25 meeting transcripts are also available in the NRC’s public website for the proposed EREF  
26 project, at <http://www.nrc.gov/materials/fuel-cycle-fac/arevanc.html#3>. Other comment  
27 documents were added to ADAMS as they were received by the NRC.  
28

29 Members of the public can access ADAMS at <http://www.nrc.gov/reading-rm/adams.html>. From  
30 this website, the transcripts and other comment documents can be accessed by entering their  
31 ADAMS Accession Numbers (or ML numbers). The ADAMS Accession Numbers for the  
32 comment documents are identified in Table I-1 in Appendix I.  
33

34 In general, the issues identified in the comments were similar to those brought up during the EIS  
35 scoping process (see Section 1.4.2 and Appendix A). The comments received during the Draft  
36 EIS public comment period were on topics in all the major issues and resource areas addressed  
37 in the EIS except for noise and environmental justice. As discussed in Section 1.4.5, issues that  
38 are related to safety and security, nonproliferation, and the credibility of the applicant are not  
39 part of the scope of the EIS. Other safety issues are addressed in the NRC’s SER (NRC,  
40 2010a).  
41

42 **1.4.7 Changes from the Draft EIS**  
43

44 The majority of changes to the Draft EIS that the NRC staff made in preparing the Final EIS  
45 were minor corrections and a number of updates and clarifications. Among these changes,  
46 based on recent project developments or certain comments on the Draft EIS (see Appendix I,  
47 Section I.5), updated or additional information has been included in the EIS in some of the  
48 resource area sections and other sections and appendices, to provide more current or complete



1 information and/or analyses. The impacts assessed and the NRC staff's findings and  
2 conclusions remain unchanged for all resource areas.

3  
4 The most noteworthy of the changes from the Draft EIS are identified below:

5  
6 Chapter 1 Introduction

- 7
- 8 • Information in Sections 1.3.1 and 1.3.2 relating to purpose and need for the proposed  
9 action has been updated.
  - 10
  - 11 • Additional information explaining why nonproliferation is not within the scope of the EIS  
12 has been added to Section 1.4.5.
  - 13
  - 14 • Information on the Draft EIS public comment period and associated public participation  
15 activities, and on comments received on the Draft EIS, has been added (see  
16 Section 1.4.6).
  - 17
  - 18 • Information in Sections 1.5.4.1 and 1.5.4.2 regarding *Endangered Species Act* and  
19 *National Historic Preservation Act* (NHPA) consultations, respectively, conducted by the  
20 NRC staff has been updated.

21  
22 Chapter 2 Alternatives

- 23
- 24 • Information in the introduction to Section 2.1 has been updated to indicate that AES  
25 initiated preconstruction activities in late 2010.
  - 26
  - 27 • Information in Section 2.1.5.1 regarding the status of conversion facilities for depleted  
28 uranium hexafluoride has been updated.
  - 29
  - 30 • Information in Section 2.2 regarding the no-action alternative has been updated.
  - 31
  - 32 • Information on mitigation of impacts to historic and cultural resources due to  
33 preconstruction activities, and on the NHPA Section 106 consultation, has been updated  
34 in Table 2-6, Section 2.4, under both the proposed action and no-action alternative.

35  
36 Chapter 3 Affected Environment

- 37
- 38 • Information in Section 3.2.1 regarding the applicability of the *Farmland Protection Policy*  
39 *Act* to the proposed EREF project has been updated.
  - 40
  - 41 • Additional information on seismicity/earthquakes has been added to Section 3.6.1.1.

42  
43 Chapter 4 Environmental Impacts and Chapter 5 Mitigation

- 44
- 45 • Information on mitigation of impacts to historic and cultural resources due to  
46 preconstruction activities, and on the NHPA Section 106 consultation, has been  
47 updated in Sections 4.2.2.1 and 4.2.2.3.

- 1 • Information on potential visual impacts from construction and operation of the proposed  
2 EREF on the quality of the recreational experience at Hell's Half Acre Wilderness Study  
3 Area (WSA) has been added to Section 4.2.3.1.  
4
- 5 • Information on water appropriation and usage during construction and operation was  
6 updated in Sections 4.2.6.1 and 4.2.6.2, respectively.  
7
- 8 • Additional NRC-recommended mitigation measures for potential impacts to water quality  
9 during preconstruction and construction have been added to Sections 4.2.6.3 and 5.2  
10 (Table 5-3).  
11
- 12 • Expanded discussions of impacts on sage-grouse during operation of the proposed  
13 EREF have been provided in Sections 4.2.7.2 and 4.3.7.  
14
- 15 • Additional AES mitigation measures for potential impacts to ecological resources have  
16 been added to Sections 4.2.7.3 and 5.1 (Table 5-1), and additional NRC-recommended  
17 mitigation measures have been added to Sections 4.2.7.2 and 5.2 (Tables 5-3 and 5-4).  
18
- 19 • For comparison with the original ground-level release calculations, impacts on public  
20 health from elevated releases of radionuclides from the proposed EREF during normal  
21 operation were added in Section 4.2.10.2 (details added in Appendix E, Section E.3.1).  
22
- 23 • Expanded coverage on solid, liquid, and mixed wastes has been provided in  
24 Section 4.2.11.2.  
25
- 26 • Section 4.2.12.4 has been added to provide a discussion of the potential effect of a  
27 facility such as the proposed EREF on surrounding property values.  
28
- 29 • Information has been added to Section 4.2.17 regarding the estimated amount of CO<sub>2</sub>  
30 emissions avoided from coal-burning power plants through use by nuclear power plants  
31 of fuel fabricated from UF<sub>6</sub> enriched at the proposed EREF  
32
- 33 • Clarification on the region of influence (ROI) used in the cumulative impact analysis has  
34 been added to the introduction to Section 4.3  
35
- 36 • Information on water usage during construction and operation of the proposed EREF  
37 was updated in Section 4.3.6. Also provided in Section 4.3.6 is additional information  
38 on prior contamination of the Eastern Snake River Plain (ESRP) aquifer originating from  
39 Idaho National Laboratory (INL).  
40

#### 41 Chapter 6 Environmental Measurement and Monitoring Programs

42

- 43 • Clarifications regarding the groundwater monitoring program have been added to  
44 Section 6.1.5.  
45
- 46 • Additional information has been added to Section 6.2.2.1 regarding ecological  
47 monitoring along the proposed 161-kV transmission line to provide power for the  
48 proposed EREF.

1        Appendix B Consultation Letters  
2

- 3        • Appendix B has been updated to reflect additional consultations conducted since the  
4        Draft EIS was issued.  
5

6        Appendix E Dose Methodology and Impacts  
7

- 8        • Impacts on public health from elevated releases of radionuclides from the proposed  
9        EREF during normal operation were estimated in Section E.3.1 for comparison with the  
10       previously estimated impacts from ground-level releases.  
11

12    **1.4.8 Related Relevant Documents**  
13

14    The following documents were reviewed as part of the development of this EIS.  
15

- 16    • *Environmental Impact Statement for the Proposed American Centrifuge Plant in Piketon,*  
17    *Ohio, Final Report. NUREG-1834, Office of Nuclear Material Safety and Safeguards,*  
18    *U.S. Nuclear Regulatory Commission, April 2006.* This EIS analyzes the potential  
19    environmental impacts of the proposed siting, construction, operation, and decommissioning  
20    of a gas centrifuge uranium enrichment facility at the existing DOE reservation in Piketon,  
21    Ohio. Its description of the purpose and need of the proposed action, as well as its review  
22    of alternatives to the proposed action, are highly relevant to the alternatives analysis for the  
23    proposed ERE project. The environmental impacts discussed for the proposed ACP are  
24    also relevant to the impact analysis for the proposed EREF, especially the analysis of  
25    cumulative impacts associated with the management of depleted uranium and low-level  
26    wastes from the proposed EREF, the ACP, the NEF, and the proposed GLE Facility, as well  
27    as the existing DOE inventory of depleted uranium hexafluoride (UF<sub>6</sub>).  
28
- 29    • *Environmental Impact Statement for the Proposed National Enrichment Facility in Lea*  
30    *County, New Mexico, Final Report. NUREG-1790, Office of Nuclear Material Safety and*  
31    *Safeguards, U.S. Nuclear Regulatory Commission, June 2005.* This EIS analyzes the  
32    potential environmental impacts of the proposed siting, construction, operation, and  
33    decommissioning of a gas centrifuge uranium enrichment facility near Eunice, New Mexico.  
34    Its description of the purpose and need of the proposed action, as well as its review of  
35    alternatives to the proposed action, are highly relevant to the alternatives analysis for the  
36    proposed EREF project. The environmental impacts discussed for the proposed NEF are  
37    also relevant to the impact analysis for the proposed EREF, especially the analysis of  
38    cumulative impacts associated with the management of depleted uranium and low-level  
39    wastes from the proposed EREF, the ACP, the NEF, and the proposed GLE Facility, as well  
40    as the existing DOE inventory of depleted UF<sub>6</sub>.  
41
- 42    • *Final Environmental Impact Statement for the Construction and Operation of a Depleted*  
43    *Uranium Hexafluoride Conversion Facility at the Portsmouth, Ohio, Site. DOE/EIS-0360,*  
44    *Oak Ridge Operations, Office of Environmental Management, U.S. Department of Energy,*  
45    *June 2004.* This site-specific EIS analyzes the impacts associated with the construction,  
46    operation, and decommissioning of a depleted UF<sub>6</sub> conversion facility at the Portsmouth,  
47    Ohio, site. The EIS also evaluates the impacts of transporting cylinders (depleted UF<sub>6</sub>,  
48    enriched uranium, and empty) to Portsmouth that used to be stored at the East Tennessee

1 Technology Park near Oak Ridge, Tennessee. Also evaluated are transportation of  
2 depleted UF<sub>6</sub> conversion products and waste materials to a disposal facility; transportation  
3 and sale of the hydrogen fluoride produced as a conversion co-product; and neutralization of  
4 hydrogen fluoride to calcium fluoride and the sale or disposal of the calcium fluoride in the  
5 event that the hydrogen fluoride product is not sold. The results presented in the EIS are  
6 relevant to the management, use, and potential impacts associated with the depleted UF<sub>6</sub>  
7 that would be generated at the proposed EREF and the cumulative impacts of depleted UF<sub>6</sub>  
8 from the ACP, the NEF, the proposed EREF, and the proposed GLE Facility, as well as the  
9 existing DOE inventory of depleted UF<sub>6</sub>.

- 10
- 11 • *Final Environmental Impact Statement for the Construction and Operation of a Depleted*  
12 *Uranium Hexafluoride Conversion Facility at the Paducah, Kentucky, Site. DOE/EIS-0359,*  
13 *Oak Ridge Operations, Office of Environmental Management, U.S. Department of Energy,*  
14 *June 2004.* This site-specific EIS is very similar to the EIS for the Portsmouth, Ohio, site,  
15 except that the conversion facility is at the Paducah, Kentucky, site.  
16
  - 17 • *Environmental Assessment: Disposition of Russian Federation Titled Natural Uranium.*  
18 *DOE/EA-1290, Office of Nuclear Energy, Science and Technology, U.S. Department of*  
19 *Energy, June 1999.* This Environmental Assessment (EA) analyzed the environmental  
20 impacts of transporting natural UF<sub>6</sub> from the gaseous diffusion plants to the Russian  
21 Federation. Transportation by rail and truck were considered. The EA addresses both  
22 incident-free transportation and transportation accidents. The results presented in this EA  
23 are relevant to the transportation of UF<sub>6</sub> for the proposed EREF.  
24
  - 25 • *Final Programmatic Environmental Impact Statement for Alternative Strategies for the Long-*  
26 *Term Management and Use of Depleted Uranium Hexafluoride. DOE/EIS-0269, Office of*  
27 *Nuclear Energy, Science and Technology, U.S. Department of Energy, April 1999.* This EIS  
28 analyzes strategies for the long-term management of the depleted UF<sub>6</sub> inventory that was  
29 stored at three DOE sites near Paducah, Kentucky; Portsmouth, Ohio; and Oak Ridge,  
30 Tennessee, at the time this EIS was prepared. This EIS also analyzes the potential  
31 environmental consequences of implementing each alternative strategy for the period 1999  
32 through 2039. The results presented in this EIS are relevant to the management, use, and  
33 potential impacts associated with the depleted UF<sub>6</sub> that would be generated at the proposed  
34 EREF and the cumulative impacts of depleted UF<sub>6</sub> from the ACP, the NEF, the proposed  
35 EREF, and the proposed GLE Facility, as well as the existing DOE inventory of depleted  
36 UF<sub>6</sub>.  
37
  - 38 • *Advanced Mixed Waste Treatment Project (AMWTP) Final Environmental Impact Statement.*  
39 *DOE/EIS-0290, Idaho Operations Office, U.S. Department of Energy, January 1999.* This  
40 site-specific EIS evaluates the alternatives associated with the treatment and packaging of  
41 stored onsite radioactive waste at the Idaho National Laboratory (INL) site for offsite  
42 disposal. Treatment of offsite radioactive waste is also considered. As the INL is located  
43 within approximately 1 mile of the proposed EREF property located in Bonneville County,  
44 Idaho, the characterization of the affected environment in this EIS is relevant to existing  
45 conditions (e.g., air quality, ecology, geology, and hydrology) at and near the proposed  
46 EREF site.  
47

- 1 • *Idaho High-Level Waste & Facilities Disposition, Final Environmental Impact Statement.*  
2 *DOE/EIS-0287, Idaho Operations Office, U.S. Department of Energy, September 2002.*  
3 This site-specific EIS evaluates the alternatives associated with the treatment and disposal  
4 of certain mixed wastes (waste with both hazardous and radioactive components) generated  
5 by past spent nuclear fuel reprocessing operations at the INL. As the INL is located within  
6 approximately 1 mile of the proposed EREF property located in Bonneville County, Idaho,  
7 the characterization of the affected environment in this EIS is relevant to existing conditions  
8 (e.g., air quality, ecology, geology, and hydrology) at and near the proposed EREF site.  
9
- 10 • *Draft Environmental Impact Statement for the Proposed Consolidation of Nuclear*  
11 *Operations Related to Production of Radioisotope Power. DOE/EIS-0373D, Office of*  
12 *Nuclear Energy, Science and Technology, U.S. Department of Energy, June 2005.* This EIS  
13 analyzes the impacts from the consolidation of facilities necessary for the production of  
14 radioisotope power systems. One site considered is the INL in southeastern Idaho. As the  
15 INL is located within approximately 1 mile of the proposed EREF property located in  
16 Bonneville County, Idaho, the characterization of the affected environment in this EIS for the  
17 INL is relevant to existing conditions (e.g., air quality, ecology, geology, and hydrology) at  
18 and near the proposed EREF site.  
19

## 20 **1.5 Applicable Statutory and Regulatory Requirements**

### 21 **1.5.1 Applicable State of Idaho Requirements**

22 Certain environmental requirements, including some discussed earlier, have been delegated to  
23 State authorities for implementation, enforcement, or oversight. Table 1-1 provides a list of  
24 State of Idaho environmental requirements.  
25

### 26 **1.5.2 Permit and Approval Status**

27 Several construction and operating permit applications must be prepared and submitted by AES  
28 or its agents, and regulatory approval and/or permits must be received prior to EREF project  
29 construction or facility operation. Decommissioning of the EREF would be addressed in the  
30 decommissioning plan required pursuant to 10 CFR Parts 30 and 40. Table 1-2 lists the  
31 potentially required Federal, State, and local permits and their present status.  
32

### 33 **1.5.3 Cooperating Agencies**

34 No Federal, State, or local agencies or tribes have come forward as cooperating agencies in the  
35 preparation of this EIS.  
36

### 37 **1.5.4 Consultations**

38 The consultation requirements of the *Endangered Species Act of 1973* and the *National Historic*  
39 *Preservation Act* apply to the NRC regarding the licensing of the proposed EREF. The  
40 consultation correspondence discussed below is provided in Appendix B of this EIS.  
41

**Table 1-1 State of Idaho Environmental Requirements**

Law/Regulation	Citation	Requirements
Air Pollution Control	<i>Idaho Administrative Procedures Act</i> (IDAPA) 58.01.01 authorized by <i>Idaho Statutes</i> (IS), Title 39, Chapter 1, Environmental Quality – Health	Requires a permit before an owner or operator may begin the construction or modification of any stationary source, facility, major facility, or major modification; stationary source permit applicants must demonstrate compliance with all applicable Federal, State, and local emission standards, and that the source will not cause or significantly contribute to a violation of any ambient air quality standard.
Water Quality Standards	IDAPA 58.01.02, authorized by IS, Title 39, Chapter 1, Environmental Quality – Health, and Chapter 36, Water Quality	Designates uses for waters in the State and establishes water quality standards to protect those uses; places restrictions on the discharge of wastewaters and on human activities which may adversely affect public health and water quality in State waters.
Public Water Drinking Systems	IDAPA 58.01.08 authorized by IS, Title 39, Chapter 1, Environmental Quality – Health	Controls and regulates the design, construction, operation, maintenance, and quality control of public drinking water systems; adopts 40 CFR Parts 141 and 143 national primary and secondary drinking water regulations by reference. Requires a plan that demonstrates that the water system has adequate technical and managerial capacity and written approval of the site by the Idaho Department of Environmental Quality prior to drilling a public water system well.
Hazardous Waste	IDAPA 58.01.05 as authorized by IS, Title 39, Chapter 44, Hazardous Waste Management	Requires hazardous waste permits for treating, storing, or disposing of hazardous wastes; permit provisions are dependent on volumes and types of wastes generated and management level (i.e., storage, treatment, and/or disposal).



**Table 1-1 State of Idaho Environmental Requirements (Cont.)**

Law/Regulation	Citation	Requirements
Protection of Graves	IS, Title 27, Chapter 5, Protection of Graves	Prohibits willful removal, mutilation, defacing, injuring, or destroying any cairn or grave; allows excavation by a professional archaeologist if action is necessary to protect the burial site from foreseeable destruction and upon prior notification to affected parties.
Disposal of Radioactive Materials	IDAPA 58.01.10 as authorized by IS, Title 39, Chapter 44, Hazardous Waste Management	Regulates the disposal of radioactive materials not regulated under the <i>Atomic Energy Act of 1954</i> , as amended, at State-permitted facilities; places restrictions on disposal of certain radioactive materials at municipal solid waste landfills and identifies other approved disposal options for radioactive materials. Adopts the radiation protection standards contained in 10 CFR Part 20.
Preservation of Historic Sites	IS, Title 67, Chapter 46, Preservation of Historic Sites	Authorizes the governing body of any county or city to establish a historic preservation commission that can conduct surveys of local historic properties, acquire interests in them, and participate in land use planning.
Wastewater Rules	IDAPA 58.01.16 as authorized by IS, Title 39, Chapter 1, Environmental Quality – Health, and Chapter 36, Water Quality	Requires the State to certify that the NPDES permit issued by the EPA complies with the State’s water quality standards.
Well Construction Standards Rules	IDAPA 37.03.09 as authorized by IS, Title 42, Chapter 2, Appropriation of Water – Permits, Certificates, and Licenses – Survey	Establishes minimum standards for the construction of all new wells and the modification and decommissioning (abandonment) of existing wells; applies to all water wells, monitoring wells, and other artificial openings and excavations in the ground that are more than 18 feet in vertical depth below land surface.
Rules Governing Classification and Protection of Wildlife	IDAPA 13.01.06, as authorized by IS, Title 36, Chapter 2, Classifications and Definitions	Defines and lists State threatened and endangered species and bans taking or possessing them.
Individual/Subsurface Sewage Disposal Rules	IDAPA 58.01.03 as authorized by IS, Title 39, Chapter 1, Environmental Quality – Health	Requires a permit to construct, modify, or repair individual or subsurface sewage disposal systems.

**Table 1-2 Potentially Applicable Permitting and Approval Requirements and Their Status for the Construction, Operation, and Decommissioning of the Proposed Eagle Rock Enrichment Facility**

<b>License, Permit, or Other Required Approval</b>	<b>Responsible Agency</b>	<b>Authority</b>	<b>Relevance and Status</b>
<b>Federal</b>			
Domestic Licensing of Special Nuclear Material, Domestic Licensing of Source Material, Rules of General Applicability to Domestic Licensing of Byproduct Material	NRC	10 CFR Part 70, 10 CFR Part 40, 10 CFR Part 30 as authorized by the <i>Atomic Energy Act</i>	Submitted
NPDES Industrial Stormwater Permit	EPA Region 10	40 CFR Part 122 as authorized by the CWA	Application to be submitted <sup>a</sup>
NPDES Construction General Permit	EPA Region 10	40 CFR Part 122 as authorized by the CWA	Applications to be submitted by AES and Rocky Mountain Power <sup>a</sup>
Section 404 Permit	U.S. Army Corps of Engineers (USACE)	40 CFR Part 230 authorized by the CWA	Not required per letter issued by the USACE
<i>Endangered Species Act</i> Consultation	FWS	50 CFR Part 402 authorized by the <i>Endangered Species Act</i>	Not required per letter issued by the FWS
<b>State</b>			
Air: Permit to Construct	Idaho Department of Environmental Quality/Air Quality Division (IDEQ/AQD)	<i>Idaho Administrative Procedures Act</i> (IDAPA) 58.01.01 authorized by the <i>Idaho Environmental Protection and Health Act</i>	Not required; proposed EREF satisfies IDAPA Permit to Construct exemptions
Air: Operating Permit (under Title V)	IDEQ/AQD	IDAPA 58.01.01 authorized by the <i>Idaho Environmental Protection and Health Act</i>	Not required; proposed EREF emissions do not meet thresholds

**Table 1-2 Potentially Applicable Permitting and Approval Requirements and Their Status for the Construction, Operation, and Decommissioning of the Proposed Eagle Rock Enrichment Facility (Cont.)**

License, Permit, or Other Required Approval	Responsible Agency	Authority	Relevance and Status
<b>State (Cont.)</b>			
National Emission Standards for Hazardous Air Pollutants Permit	IDEQ/AQD	IDAPA 58.01.01 authorized by the <i>Idaho Environmental Protection and Health Act</i>	Not required; proposed EREF would not be a major source of criteria air pollutants or source of hazardous air pollutants
Hazardous Waste Permit	IDEQ/Waste Management and Remediation Division	IDAPA 58.01.05 authorized by the <i>Hazardous Waste Management Act</i>	Not required; the proposed EREF qualifies as a small quantity generator – a generator identification number will be requested
NPDES Section 401 Permit Certification	IDEQ/Water Quality Division (WQD)	IDAPA 58.01.16 authorized by the <i>Idaho Environmental Protection and Health Act</i>	Certification decisions will be made when EPA issues the proposed final NPDES permits
Well Drilling Permit	Idaho Department of Water Resources	IDAPA 37.03.09 as authorized by Title 42 of the <i>Idaho Statutes</i>	Application to be submitted
Easement on State Owned Land	Department of Lands	IDAPA 20.03.08 authorized by the <i>Public Depository Law</i>	Not required; access nor easement is needed over the endowment trust lands proximate to the proposed EREF
<i>Safe Drinking Water Act</i> Drinking Water System	IDEQ/WQD	IDAPA 58.01.08 authorized by the <i>Idaho Environmental Protection and Health Act</i>	Comprehensive treatment plan will be prepared; operations will be placed under a licensed operator
Sanitary System Permit	IDEQ/WQD	IDAPA 58.01.03 authorized by the <i>Idaho Environmental Protection and Health Act</i>	Not required for the proposed EREF (zero-discharge system), but may be required for the Visitor Center.

**Table 1-2 Potentially Applicable Permitting and Approval Requirements and Their Status for the Construction, Operation, and Decommissioning of the Proposed Eagle Rock Enrichment Facility (Cont.)**

License, Permit, or Other Required Approval	Responsible Agency	Authority	Relevance and Status
<b>State (Cont.)</b>			
Access Permit	Idaho Transportation Department	IDAPA 39.03.42 authorized by Titles 40, 49, and 67 of the <i>Idaho Statutes</i>	Application to be submitted
Construction Permits: Electrical, Plumbing, HVAC	Idaho Division of Building Safety	IDAPA 07.01.01, 07.02.04, 07.07.01 authorized by Title 54 of the <i>Idaho Statutes</i>	Application to be submitted
Machine-produced Radiation Registration	Idaho Department of Health and Welfare/Radiation Control Agency	IDAPA 16.02.27 authorized by Title 56 of the <i>Idaho Statutes</i>	Application to be submitted
<b>County</b>			
Construction Permits: Structural, Mechanical	Bonneville County	<i>Bonneville County Ordinance 218-07</i>	Application to be submitted

<sup>a</sup> Updates on the NPDES permitting process can be viewed on the EPA website at: [http://cfpub.epa.gov/npdes/stormwater/noi/noidetail\\_new.cfm?AppIId=IDR10C101](http://cfpub.epa.gov/npdes/stormwater/noi/noidetail_new.cfm?AppIId=IDR10C101).

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**1.5.4.1 Endangered Species Act of 1973 Consultation**

NRC staff consulted with the FWS to comply with the requirements of Section 7 of the *Endangered Species Act*. On June 17, 2009, the NRC staff sent a letter to the FWS Eastern Idaho Field Office describing the proposed action and requesting a list of threatened and endangered species and critical habitats that could potentially be affected by the proposed action. By letter dated July 15, 2009, the FWS Eastern Idaho Field Office indicated that no listed species are present at the project location. On February 18, 2010, the NRC sent a letter to the FWS Eastern Idaho Field Office reporting the installation of a proposed electrical transmission line to power the proposed EREF project and requesting a list of threatened and endangered species and critical habitats that could potentially be affected by the proposed transmission line and associated facilities. By letter dated March 9, 2010, the FWS Eastern Idaho Field Office pointed out that the protections provided to bald eagles under the *Bald and Golden Eagle Protection Act* and the *Migratory Bird Treaty Act* remain in place even though the bald eagle is no longer included on the list of threatened and endangered species in the lower 48 States. The March letter also referenced the potential of transmission lines to affect migratory birds. A letter dated July 14, 2010, from the NRC to the FWS Eastern Idaho Field Office, transmitted a copy of the Draft EIS, summarized the contents of the above correspondence, and also summarized an April 15, 2010, telephone conversation between the NRC and Mr. Ty Matthews of the FWS Eastern Idaho Field Office. During that conversation, Mr. Matthews indicated that the list of endangered, threatened, proposed, and candidate

1 species provided by the FWS with its March 9, 2010, letter was for Bonneville County in  
2 general; he did not believe that these species are in the vicinity of, or potentially impacted by,  
3 the proposed transmission line project; and consultation by the NRC with the FWS under  
4 Section 7 of the *Endangered Species Act* would not be needed for these species for the  
5 proposed project.

6  
7 In addition, the NRC has reviewed the results of field surveys (see Section 4.2.7) and  
8 determined that no threatened or endangered species would be affected by the proposed  
9 EREF.

10  
11 Additionally, by letters dated June 22, 2009, and June 24, 2009, the NRC communicated with  
12 the Idaho Department of Fish and Game and the Idaho Office of Energy Resources,  
13 respectively, regarding the proposed action. The NRC again corresponded with the Idaho  
14 Department of Fish and Game and the Idaho Office of Energy Resources on February 10, 2010,  
15 and February 18, 2010, respectively, reporting the installation of a transmission line to power  
16 the proposed EREF project. The Idaho Department of Fish and Game (IDFG) corresponded  
17 with the NRC on August 4, 2009, and April 14, 2010. On June 8, 2010, the NRC provided IDFG  
18 with additional information on sage grouse surveys conducted for the project.

#### 19 20 **1.5.4.2 National Historic Preservation Act of 1966 Section 106 Consultation**

21  
22 Pursuant to Section 106 of the NHPA, in a letter dated June 17, 2009, the NRC initiated  
23 consultation with the Idaho State Historical Society, State Historic Preservation Office (SHPO).  
24 In this letter, the NRC identified the Area of Potential Effect (APE) for the proposed project and  
25 informed the SHPO that archaeological surveys of the APE had been undertaken by a  
26 contractor to AES. Also in the letter, the NRC stated its intent to use the NEPA process to  
27 comply with Section 106 of the NHPA as allowed in 36 CFR Part 800.8. In a letter dated  
28 September 16, 2009, the NRC discussed the AES request to commence preconstruction  
29 activities prior to NRC's completion of its environmental review. In a letter dated February 17,  
30 2010, the NRC relayed that a 161-kV transmission line would be constructed and operated to  
31 power the proposed EREF and that the APE for the proposed EREF had changed. On April 16,  
32 2010, Argonne National Laboratory (Argonne), on behalf of the NRC, provided the SHPO with  
33 copies of the following AES documents: a report providing information on the proposed 161-kV  
34 transmission line project to provide power to the proposed EREF; a Treatment Plan describing  
35 the process for mitigating the adverse effect from the proposed EREF project to site MW004  
36 (the *National Register of Historic Places* (NRHP)-eligible John Leopard Homestead) by  
37 professional excavation and data recovery (see Sections 3.3.4 and 4.2.2); a report presenting  
38 the findings of X-ray fluorescence (XRF) analysis conducted on obsidian artifacts found in the  
39 proposed EREF project's APE; and an archaeological survey report conducted for the  
40 unsurveyed portions of the expanded APE identified in the NRC's February 17, 2010 letter. In a  
41 letter dated May 3, 2010, the SHPO acknowledged the expanded EREF project footprint and  
42 proposed transmission line project described in the NRC's February 17, 2010, letter; requested  
43 additional copies and/or clarifications of certain AES cultural resource survey reports; expressed  
44 support for the proposed treatment of (i.e., mitigation of an adverse effect to) site MW004, and  
45 appreciation for receiving a letter report on the XRF analysis of obsidian artifacts; and outlined  
46 the next steps in the consultation process including development of a Memorandum of  
47 Agreement (MOA) between the NRC and the SHPO to define the mitigation of the adverse  
48 effect resulting from the removal of site MW004 as a result of the proposed EREF project.

1 A letter from the NRC dated July 14, 2010, continued the Section 106 consultation process,  
2 notified the SHPO of the issuance of the Draft EIS, and transmitted copies of the Draft EIS for  
3 the SHPO's review and comment. In addition, this letter discussed the NRC staff's  
4 determination of the APE for the proposed EREF and transmission line projects and the staff's  
5 preliminary determination in the Draft EIS of the impacts on historic and cultural resources that  
6 would result from the preconstruction, construction, operation, and decommissioning of the  
7 proposed project, including the adverse effect on site MW004 and the proposed mitigation of the  
8 adverse effect by professional excavation. In a letter dated July 22, 2010, the SHPO stated that  
9 they had reviewed the Draft EIS and found that the historic and cultural resource sections  
10 accurately reflected the identification efforts conducted to date under Section 106 of the NHPA.  
11 Additionally, the letter recommended that a statement be added in the Final EIS that effects on  
12 site MW004 will be resolved through an MOA.  
13

14 By letter dated August 31, 2010, the NRC informed the Advisory Council on Historic  
15 Preservation (ACHP) of the adverse effect to site MW004 as a result of the proposed EREF  
16 project and that the NRC is drafting an MOA regarding the mitigation of this adverse effect.  
17 Also, this letter presented the NRC's invitation to the ACHP to participate in the NHPA Section  
18 106 consultation for the proposed EREF project; provided relevant background information on  
19 the proposed project and on the MOA; and transmitted copies of project consultation letters,  
20 cultural resource survey reports, and related documents. By letter dated September 20, 2010,  
21 the ACHP responded that they do not believe their participation in the consultation to resolve  
22 the adverse effect is needed at this time, but may reconsider this decision if they receive a  
23 request for participation from a consulting party or other party. The ACHP also stated that once  
24 the MOA is signed, it must be filed with the ACHP to complete the requirements of Section 106  
25 of the NHPA.  
26

27 On June 4, 2009, the NRC met with the Shoshone-Bannock Tribal Council to inform them of the  
28 project. By letter dated July 29, 2009, the NRC formally initiated the Section 106 consultation  
29 process with the Shoshone-Bannock Tribes. By letters dated September 16, 2009, and  
30 February 19, 2010, the NRC continued the consultation process with the Shoshone-Bannock  
31 Tribes regarding the AES request to commence certain activities prior to NRC's completion of  
32 its environmental review and the installation of the transmission line and associated structures,  
33 respectively. On August 11, 2010, the NRC again met with the Shoshone-Bannock Tribal  
34 Council to discuss, and answer questions about, the proposed project. In a letter dated October  
35 8, 2010, the NRC described the adverse effect to site MW004, informed the Tribes about the  
36 development of an MOA for the proposed EREF project, and invited the Shoshone-Bannock  
37 Tribes to participate in the development of the MOA as a concurring party. In a December 22,  
38 2010, telephone conversation with a tribal representative, the NRC was informed that the  
39 Shoshone-Bannock Tribes want to be a party to the MOA.  
40

41 Follow-ups on correspondence with the SHPO and the Shoshone-Bannock Tribes were  
42 conducted through subsequent telephone conversations and emails (see Appendix B,  
43 Section B.2). On October 13, 2010, the NRC informed the SHPO, by email, that AES had  
44 begun work on the mitigation of site MW004, in the manner identified in the Treatment Plan  
45 provided to the SHPO with Argonne's letter dated April 16, 2010. On January 26, 2011, the  
46 NRC informed the SHPO that the Shoshone-Bannock Tribes had accepted the NRC's invitation  
47 to be a concurring party on the MOA, and about the NRC's progress on developing a draft of the



1 MOA for review by the parties. Additional information regarding development of the MOA is  
2 presented in Section 4.2.2.1 of this EIS.

### 3 4 **1.6 Organizations Involved in the Proposed Action**

5  
6 Two organizations have specific roles in the implementation of the proposed action:

- 7  
8 • AES is the NRC license applicant. If the license is granted, AES would be the holder of an  
9 NRC license to construct, operate, and decommission the proposed EREF and for the  
10 possession and use of special nuclear material, source material, and byproduct material at  
11 the proposed EREF. AES would be responsible for constructing, operating, and  
12 decommissioning the proposed facility in compliance with that license and applicable NRC  
13 regulations.

14  
15 AES is a Delaware limited liability corporation that was formed solely to provide uranium  
16 enrichment services for commercial nuclear power plants. AES is a wholly owned  
17 subsidiary of AREVA NC Inc. AREVA NC Inc. is a wholly owned subsidiary of the AREVA  
18 NC SA, which is part of AREVA SA (AES, 2010b). AES has indicated that its principal  
19 business location is in Bethesda, Maryland. The NRC intends to examine any foreign  
20 relationship to determine whether it is inimical to the common defense and security of the  
21 United States. The foreign ownership, control, and influence issue is beyond the scope of  
22 this EIS and is addressed as part of the NRC's SER (NRC, 2010a).

- 23  
24 • The NRC is the licensing agency. The NRC has the responsibility to evaluate the license  
25 application for compliance with the NRC regulations associated with uranium enrichment  
26 facilities. These include standards for protection against radiation in 10 CFR Part 20 and  
27 requirements in 10 CFR Parts 30, 40, and 70 that would authorize AES to possess and use  
28 byproduct material, source material, and special nuclear material, respectively, at the  
29 proposed EREF. The NRC is responsible for regulating activities, as applicable, performed  
30 within the proposed EREF through its licensing review process and subsequent inspection  
31 program. To fulfill the NRC responsibilities under NEPA, the environmental impacts of the  
32 proposed project are evaluated in accordance with the requirements of 10 CFR Part 51 and  
33 documented in this EIS.

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32

1 **2 ALTERNATIVES**

2  
3 This chapter describes and compares the proposed action and alternatives to the proposed  
4 action. As discussed in Chapter 1, the proposed action is for AREVA Enrichment Services, LLC  
5 (AES) to construct, operate, and decommission a gas centrifuge uranium enrichment facility,  
6 known as the Eagle Rock Enrichment Facility (EREF), near Idaho Falls, in Bonneville County,  
7 Idaho. In this Environmental Impact Statement (EIS), the U.S. Nuclear Regulatory Commission  
8 (NRC) staff evaluated a reasonable range of alternatives to the proposed action, including  
9 alternative sites for the AES facility, alternative sources of low-enriched uranium, alternative  
10 technologies for uranium enrichment, and the no-action alternative. Under the no-action  
11 alternative, AES would not construct, operate, or decommission the proposed EREF.  
12 Therefore, the no-action alternative provides a basis against which the potential environmental  
13 impacts of the proposed action are evaluated and compared. The EIS also discusses  
14 alternatives for the disposition of depleted uranium hexafluoride (UF<sub>6</sub>) resulting from enrichment  
15 operations over the lifetime of the proposed EREF.  
16

17 Section 2.1 presents detailed technical descriptions of the proposed action and related actions,  
18 including descriptions of the proposed site, gas centrifuge enrichment technology, and activities  
19 at the proposed EREF. The activities at the proposed EREF are grouped under preconstruction  
20 and construction, operation, and decontamination and decommissioning. Disposition of  
21 depleted UF<sub>6</sub> is also discussed in Section 2.1. Section 2.2 describes the no-action alternative.  
22 Section 2.3 discusses alternatives to the proposed action that were considered but not analyzed  
23 in detail, including alternative sites, enrichment technologies other than the proposed gas  
24 centrifuge technology, and use of alternate sources of enriched uranium. The chapter  
25 concludes with a comparison of predicted environmental impacts of the proposed action and  
26 no-action alternatives (Section 2.4) and a preliminary recommendation from the NRC staff  
27 regarding the proposed action (Section 2.5).  
28

29 **2.1 Proposed Action**

30  
31 The proposed action is for AES to construct, operate, and decommission a gas centrifuge  
32 uranium enrichment facility near Idaho Falls, in Bonneville County, Idaho. To allow the  
33 proposed action, the NRC would need to grant AES a license to possess and use special  
34 nuclear material, source material, and byproduct material at the proposed EREF. The NRC  
35 license, if granted, would be for a period of 30 years (i.e., through 2041), after which AES would  
36 request renewal of the license or begin decommissioning of the proposed facility. AES initiated  
37 preconstruction activities for the proposed EREF in late 2010, under an exemption granted by  
38 NRC (see Section 1.4.1). If NRC grants the license, AES plans to start construction of the  
39 proposed EREF in 2011, begin commercial enrichment operations in 2014, and increase to the  
40 maximum target production capacity by 2022, as shown in Table 2-1.  
41

42 The location of the proposed site is described in Section 2.1.1. The gas centrifuge enrichment  
43 process and the proposed facility are described in Sections 2.1.2 and 2.1.3, respectively.  
44 Section 2.1.4 describes the phases of the proposed action. The options for management of the  
45 depleted UF<sub>6</sub> tails generated at the proposed facility are reviewed in Section 2.1.5.  
46



**Table 2-1 Proposed Eagle Rock Enrichment Facility Schedule**

<b>Milestone</b>	<b>Estimated Date</b>
Initiate Preconstruction Work	October 2010
Requested License Approval	February 2011
Initiate Facility Construction	February 2011
Start First Cascade	February 2014
Complete Heavy Construction	February 2018
Achieve Production Output of 3.3 million SWUs	March 2018
Complete Construction	February 2022
Achieve Full Nominal Production Output	March 2022
Submit Decommissioning Plan to NRC	February 2030
Complete Construction of Decontamination and Decommissioning Facility	February 2032
Decontamination and Decommissioning Completed	February 2041

Source: AES, 2010a.

1  
2 Much of the information presented below on the description of the proposed site, the proposed  
3 EREF, and the proposed action and related activities is taken from information provided by AES  
4 in its Environmental Report (AES, 2010a).

### 5 6 **2.1.1 Location and Description of the Proposed Site and Vicinity**

7  
8 As shown in Figures 1-1 and 2-1, the proposed EREF, if approved, would be situated on the  
9 north side of US 20, about 113 kilometers (70 miles) west of the Idaho/Wyoming State line. The  
10 proposed EREF would be located approximately 32 kilometers (20 miles) west of Idaho Falls  
11 (the nearest major city), approximately 32 kilometers (20 miles) east of Atomic City, and  
12 approximately 40 kilometers (25 miles), 60 kilometers (37 miles), and 76 kilometers (47 miles)  
13 north of Blackfoot, Fort Hall, and Pocatello, respectively. The Fort Hall Indian Reservation,  
14 which encompasses about 220,150 hectares (544,000 acres), lies to the south. The nearest  
15 boundary of the reservation is about 44 kilometers (27 miles) from the proposed site. The  
16 nearest residence is 7.7 kilometers (4.8 miles) east of the proposed site. The nearest counties  
17 are Bonneville, Jefferson, and Bingham Counties, parts of which are within 8 kilometers  
18 (5 miles) of the proposed site.

19  
20 The proposed EREF would be located on a 186-hectare (460-acre) site (the “proposed site”)  
21 within a privately owned, approximately 1700-hectare (4200-acre) property (the “property” or  
22 “proposed property”) that would be purchased by AES from a single landowner (AES, 2010a).  
23 Within the 1700-hectare (4200-acre) proposed property are a 16-hectare (40-acre) parcel  
24 administered by the U.S. Bureau of Land Management (BLM) and two additional 16-hectare  
25 (40-acre) parcels for which the Federal Government had reserved rights under the *Atomic*  
26 *Energy Act of 1946*, as amended, to certain radioactive materials that might be present  
27 (e.g., uranium, thorium), along with the right to enter the land to prospect for, mine, and remove



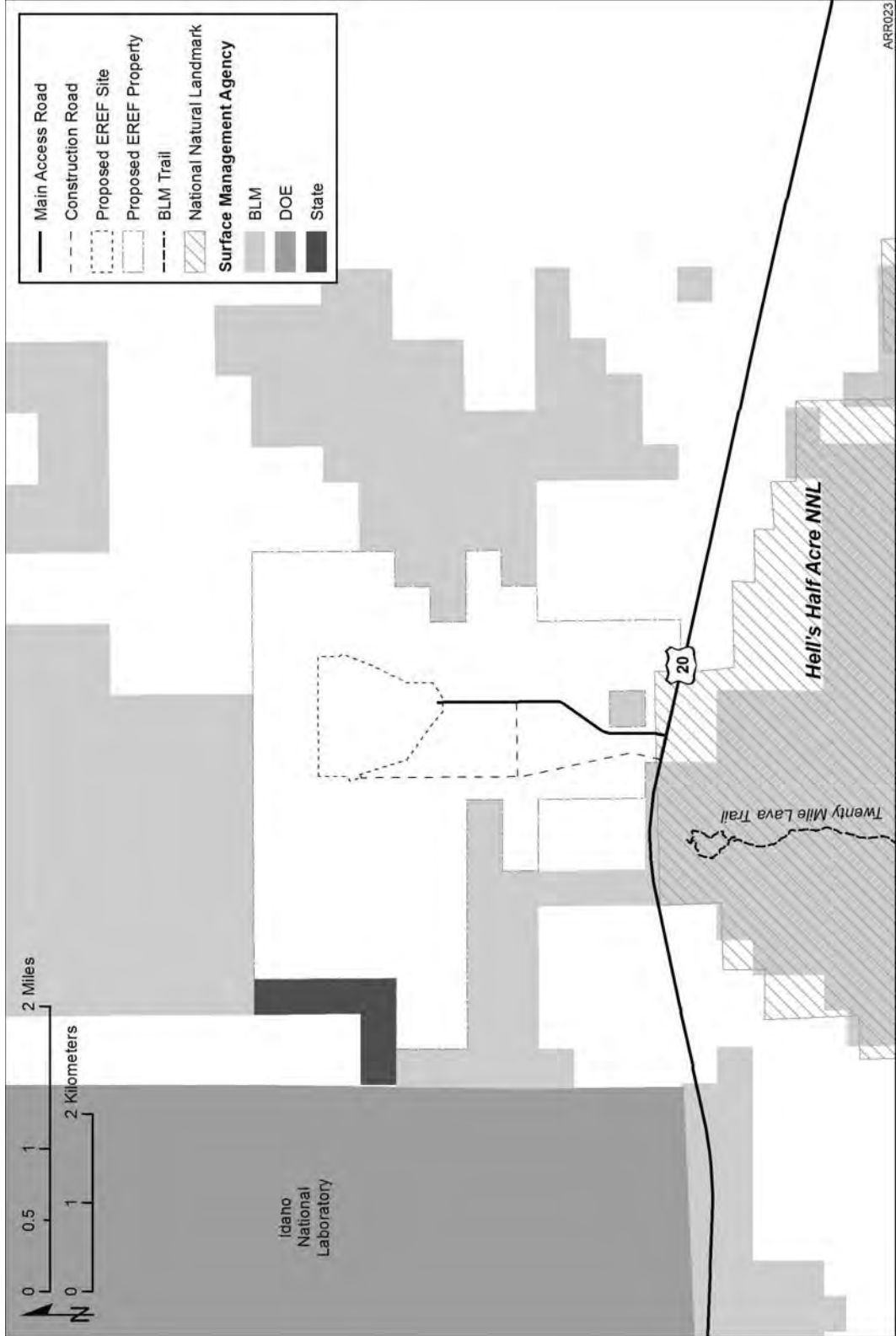


Figure 2-1 Location of the Proposed EREF Site in Bonneville County, Idaho

1 those materials. However, these reservations were subsequently relinquished pursuant to  
2 Section 68.b of the *Atomic Energy Act of 1954*, as amended, 42 U.S.C. 2098(b), and no longer  
3 have any legal effect on the property (AES, 2010a). The only right-of-way (ROW) on the  
4 proposed property is the ROW for US 20, which forms part of the southern property boundary.  
5

6 The proposed EREF property consists primarily of relatively flat and gently sloping surfaces with  
7 small ridges and areas of rock outcrop; and is semiarid steppe covered by eolian soils of  
8 variable thickness that incompletely cover broad areas of volcanic lava flows. Uses of this  
9 property, including the proposed EREF site within it, include native rangeland, nonirrigated  
10 seeded pasture, and irrigated cropland. Wheat, barley, and potatoes are grown on  
11 389 hectares (962 acres) of the proposed property. A potato storage facility is located at the  
12 south end. The property is seasonally grazed.  
13

14 The main land uses within 8 kilometers (5 miles) of the proposed site are grazing and  
15 agriculture. Grazing occurs on State-owned land immediately to the west of the proposed  
16 property and on BLM land immediately to the east. The nearest offsite croplands are located  
17 within about 0.8 kilometer (0.5 mile) of the southeast corner of the proposed property; and the  
18 nearest feedlot and dairy operations are about 16 kilometers (10 miles) to the east.  
19

20 The eastern boundary of the U.S. Department of Energy's (DOE) Idaho National Laboratory  
21 (INL) is 1.6 kilometers (1 mile) west of the proposed property. The INL land closest to the  
22 proposed site is undeveloped rangeland. The closest facility on the INL property to the  
23 proposed EREF property is the Materials and Fuels Complex (MFC), located approximately  
24 16 kilometers (10 miles) west of the proposed property boundary. The lands north, east, and  
25 south of the proposed property are a mixture of private-, Federal-, and State-owned parcels.  
26

27 Structures located within an 8-kilometer (5-mile) radius of the proposed EREF site include a  
28 transformer station (Kettle Substation) adjacent to the proposed site to the east and potato  
29 cellars, one 3.2 kilometers (2 miles) to the west of the proposed site and one 7.7 kilometers  
30 (4.8 miles) to the east. Public use areas in the immediate vicinity of the proposed AES property  
31 include a hiking trail in Hell's Half Acre Lava Field National Natural Landmark (NNL) on the  
32 south side of US 20 (see Figure 2-1). Hell's Half Acre is also a Wilderness Study Area (WSA)  
33 and is on Federal land managed by the BLM. There is also a small lava tube cave located  
34 approximately 8 kilometers (5 miles) east and south of the proposed property. The Wasden  
35 Complex, consisting of caves formed by collapsed lava tubes, is located approximately  
36 3.2 kilometers (2 miles) northeast of the footprint of the proposed EREF.  
37

### 38 **2.1.2 Gas Centrifuge Enrichment Process**

39

40 The proposed EREF would employ a proven gas centrifuge technology for enriching natural  
41 uranium (NRC, 2005b). Figure 2-2 shows the basic construction of a gas centrifuge. The  
42 technology uses a rotating cylinder (rotor) spinning at a high circumferential rate of speed inside  
43 a protective casing. The casing maintains a vacuum around the rotor and provides physical  
44 containment of the rotor in the event of a catastrophic rotor failure.  
45

46 Uranium hexafluoride (UF<sub>6</sub>) gas is fed through a fixed pipe into the middle of the rotor, where it  
47 is accelerated and spins at almost the same speed as the rotor. The centrifugal force produced  
48 by the spinning rotor causes the heavier uranium-238 hexafluoride (<sup>238</sup>UF<sub>6</sub>) molecules to

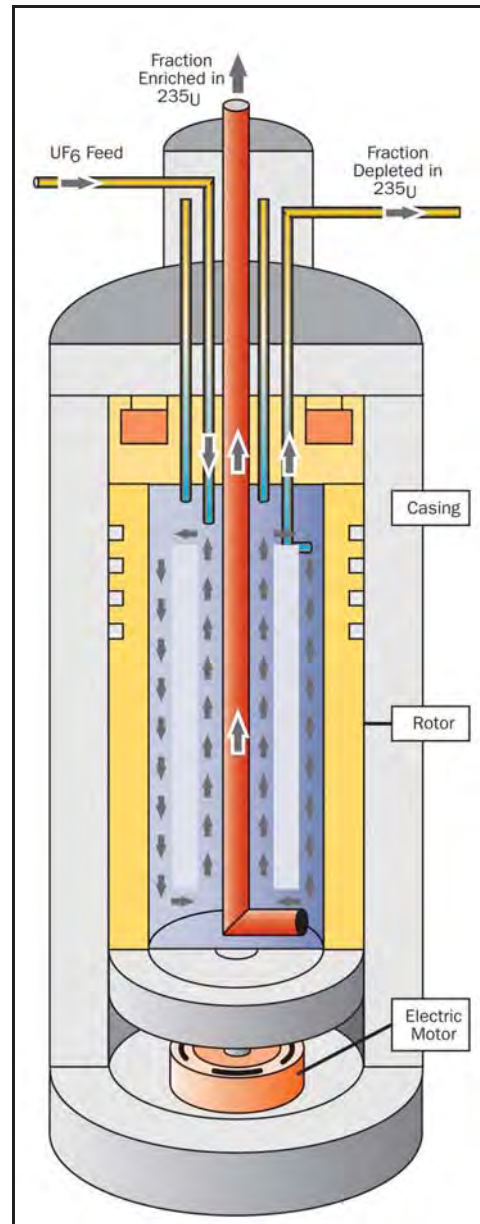
1 concentrate close to the rotor wall and the lighter  
2 uranium-235 hexafluoride ( $^{235}\text{UF}_6$ ) molecules to collect  
3 closer to the axis of the rotor. This separation effect  
4 initially occurs only in a radial direction, which increases  
5 when the rotation is supplemented by a convection  
6 current produced by a temperature difference along the  
7 rotor axis (thermoconvection). A centrifuge with this kind  
8 of gas circulation (i.e., from top to bottom near the rotor  
9 axis and from bottom to top by the rotor wall) is called a  
10 counter-current centrifuge.

11  
12 The inner and outer streams become more  
13 enriched/depleted in uranium-235 in their respective  
14 directions of movement. The biggest difference in  
15 concentration in a counter-current centrifuge does not  
16 occur between the axis and the wall of the rotor, but  
17 rather between the two ends of the centrifuge rotor. In  
18 the flow pattern shown in Figure 2-2, the enriched  $\text{UF}_6$  is  
19 removed from the lower end of the rotor and the depleted  
20  $\text{UF}_6$  is removed at the upper end through take-off pipes  
21 that run from the axis close to the wall of the rotor.

22  
23 The enrichment level achieved by a single centrifuge is  
24 not sufficient to obtain the desired concentration of 3 to  
25 5 percent by weight of uranium-235 in a single step;  
26 therefore, a number of centrifuges are connected in  
27 series to increase the concentration of the uranium-235  
28 isotope. Additionally, a single centrifuge cannot process  
29 a sufficient volume for commercial production, which  
30 makes it necessary to connect multiple centrifuges in  
31 parallel to increase the volume flow rate. The  
32 arrangement of centrifuges connected in series to  
33 achieve higher enrichment and in parallel for increased  
34 volume is called a “cascade.” A full cascade contains  
35 hundreds of centrifuges connected in series and parallel.  
36 Figure 2-3 is a diagram of a segment of a uranium  
37 enrichment cascade showing the flow path of the  $\text{UF}_6$   
38 feed, enriched  $\text{UF}_6$  product, and depleted  $\text{UF}_6$  gas. In the  
39 proposed EREF, 12 cascades would be grouped in a  
40 Cascade Hall, and each Separations Building Module  
41 (SBM) would house two Cascade Halls. There would be four identical SBMs in the full-capacity  
42 plant.

### 44 2.1.3 Description of the Proposed Eagle Rock Enrichment Facility

45  
46 The major facility buildings and structures in the proposed EREF are described in  
47 Section 2.1.3.1. Section 2.1.3.2 describes the supporting utilities. Site access would be via the  
48 local road network, as discussed in Section 2.1.3.3.



**Figure 2-2 Schematic of a Gas Centrifuge (NRC, 2009a)**

## What Is Enriched Uranium?

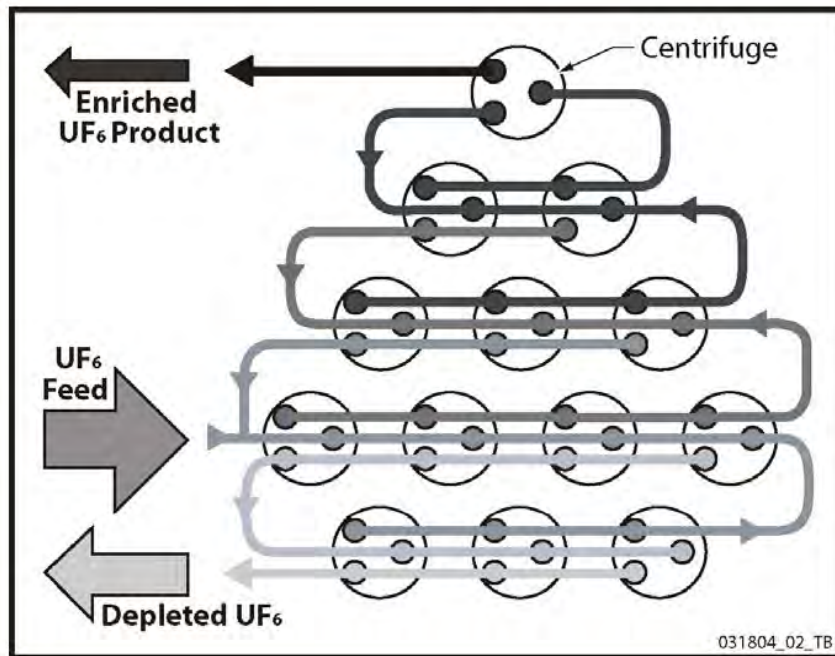
Uranium is a naturally occurring radioactive element. In its natural state, uranium contains approximately 0.72 percent by weight of the uranium-235 isotope, which is the fissile isotope of uranium. There is a very small (0.0055 percent) quantity of the uranium-234 isotope, and most of the remaining mass (99.27 percent) is the uranium-238 isotope. All three isotopes are chemically identical and only differ slightly in their physical properties. The most important difference between the isotopes is their mass. This small mass difference allows the isotopes to be separated and makes it possible to increase (i.e., "enrich") the percentage of uranium-235 in the uranium to levels suitable for nuclear power plants or, at very high enrichment, nuclear weapons.

Most civilian nuclear power reactors use low-enriched uranium fuel containing 3 to 5 percent by weight of uranium-235. Uranium for most nuclear weapons is enriched to greater than 90 percent.

Uranium would arrive at the proposed EREF as natural  $UF_6$  in solid form in a Type 48X or 48Y transport cylinder from existing conversion facilities in Port Hope, Ontario, Canada; Metropolis, Illinois; or overseas sources. To start the enrichment process, the cylinder of  $UF_6$  is heated, which causes the material to sublime (change directly from a solid to a gas). The  $UF_6$  gas is fed into the enrichment cascade where it is processed to increase the concentration of the uranium-235 isotope. The  $UF_6$  gas with an increased concentration of uranium-235 is known as "enriched" or "product." Gas with a reduced concentration of uranium-235 is referred to as "depleted"  $UF_6$  or "tails."

Source: NRC, 2005b.

1  
2



3  
4  
5

Figure 2-3 Diagram of Enrichment Cascade (NRC, 2005b)

1 **2.1.3.1 Major Facility Buildings and Structures**

2  
3 Buildings/structures within the proposed EREF will include the following:

- 4
- 5 • Cylinder Storage Pads
  - 6
  - 7 • Centrifuge Assembly Building
  - 8
  - 9 • Separations Building Modules
  - 10
  - 11 • Cylinder Receipt and Shipping Building
  - 12
  - 13 • Blending, Sampling, and Preparation Building
  - 14
  - 15 • Technical Support Building
  - 16
  - 17 • Operations Support Building
  - 18
  - 19 • Electrical and Mechanical Services Buildings
  - 20
  - 21 • Administration Building
  - 22
  - 23 • Visitor Center
  - 24
  - 25 • Security and Secure Administration Building
  - 26

27 The main process facilities at the proposed EREF are the four SBMs, with each identical unit  
28 capable of handling approximately one-quarter of plant capacity (AES, 2010a). Each SBM  
29 consists of two Cascade Halls. Each Cascade Hall is able to produce enriched UF<sub>6</sub> with a  
30 specific assay (weight percent uranium-235), giving the proposed EREF the capability of  
31 producing up to eight different assays at one time.

32  
33 **Cylinder Storage Pads**

34  
35 Concrete storage pads would be constructed for storing full feed cylinders (Type 48Y)  
36 containing natural UF<sub>6</sub> prior to use in the enrichment process, full tails cylinders (Type 48Y)  
37 containing depleted UF<sub>6</sub> after the enrichment process, full product cylinders (Type 30B)  
38 containing enriched UF<sub>6</sub> after the enrichment process, and empty feed, tails, and product  
39 cylinders. There will be a total of four pads (one pad for each of the above uses), although the  
40 empty tails pad will bisect the full tails cylinder pad.

41  
42 The pads for storage of the full feed cylinders, full tails cylinders, and empty cylinders would be  
43 located next to each other on the north side of the proposed facility. The pad capacities would  
44 be 712 full feed cylinders, 25,718 full tails cylinders, and 1840 empty cylinders. The feed  
45 cylinders would be single-stacked, while the tails and empty cylinders would be double-stacked.  
46 The pad for empty cylinders would be sized to temporarily store these cylinders for up to six  
47 months. The full tails cylinders would be stacked two high in concrete saddles that would  
48 elevate them approximately 20 centimeters (8 inches) above ground level. The pad for full tails



1 cylinders would be expanded as additional  
2 storage is required up to the maximum expected  
3 facility lifetime generation of 25,718 cylinders, if  
4 necessary (AES, 2010a). Figure 2-4 shows a  
5 cylinder stacking operation using a specialized  
6 carrier.

7  
8 Full product cylinders would be single-stacked  
9 on a single pad adjacent to the Cylinder Receipt  
10 and Shipping Building. The pad would be sized  
11 to accommodate approximately 1032 cylinders.



**Figure 2-4 Stacking Depleted UF<sub>6</sub> Cylinders in a Storage Yard (DOE, undated a)**

12  
13 **Centrifuge Assembly Building**

14  
15 The Centrifuge Assembly Building would be  
16 used for the assembly, inspection, and  
17 mechanical testing of the centrifuges prior to installation in the Cascade Halls. The building  
18 would be separated into areas for centrifuge component storage, centrifuge assembly, and  
19 assembled centrifuge storage. This building would also contain the Centrifuge Test and  
20 Postmortem Facilities that would be used to test the functional performance and operational  
21 problems of production centrifuges and ensure compliance with design parameters in addition to  
22 providing an area for the dismantlement of potentially contaminated centrifuges and also to  
23 prepare for their disposal.

24  
25 **Separations Building Modules**

26  
27 The eight proposed Cascade Halls would be contained in four identical Separations Building  
28 Modules near the center of the proposed EREF. Figure 2-5 is a photograph of centrifuges  
29 inside a Cascade Hall at URENCO. Each of the eight proposed Cascade Halls would house  
30 12 cascades, and each cascade would consist of hundreds of centrifuges connected in series  
31 and parallel to produce enriched UF<sub>6</sub>. Each Cascade Hall would be capable of producing a  
32 maximum of 825,000 separative work units (SWUs) per year.

33  
34 The centrifuges would be mounted on precast concrete floor-mounted stands (flomels). Each  
35 Cascade Hall would be enclosed by a structural steel frame supporting insulated sandwich  
36 panels (metal skins with a core of insulation) to maintain a constant temperature within the  
37 cascade enclosure.

38  
39 In addition to the Cascade Halls, each SBM would house a UF<sub>6</sub> Handling Area and a Process  
40 Service Corridor. The UF<sub>6</sub> Handling Area would contain the UF<sub>6</sub> feed input system as well as  
41 the enriched UF<sub>6</sub> product and depleted UF<sub>6</sub> take-off systems. The Process Service Corridor  
42 would contain the gas transport piping and equipment, which would connect the cascades with  
43 each other and with the product and depleted materials take-off systems. The Process Service  
44 Corridor would also contain key electrical and cooling water systems.





1  
2 **Figure 2-5 Centrifuges inside a Cascade Hall (NRC, 2005b)**

3  
4 **Cylinder Receipt and Shipping Building**

5  
6 All UF<sub>6</sub> cylinders (feed, product, and tails) would enter and leave the proposed EREF through  
7 the Cylinder Receipt and Shipping Building. Full feed and empty product and tails cylinders  
8 delivered to the proposed EREF would be inspected, unloaded off the transport trucks, and sent  
9 to their appropriate locations. Outgoing cylinders (empty feed and full product and tails) would  
10 be prepared for shipment, including overpack protection as necessary, and loaded on the  
11 transport trucks.

12  
13 **Blending, Sampling, and Preparation Building**

14  
15 The primary function of the Blending, Sampling, and Preparation Building would be filling and  
16 sampling the Type 30B product cylinders with UF<sub>6</sub> enriched to customer specifications. Other  
17 activities within the building would include cylinder preparation, inspection, testing, and  
18 maintenance. The Ventilation Room, which is also located in this building, would provide a set-  
19 aside area for testing and inspecting Type 30B, 48X, and 48Y cylinders for use in the proposed  
20 EREF. The Ventilation Room would be maintained under negative pressure and would require  
21 entry and exit through an airlock.

1 **Technical Support Building**  
2

3 The Technical Support Building would contain radiological support areas for the proposed  
4 facility and would act as the secure point of entry to the SBMs and the Blending, Sampling, and  
5 Preparation Building. This building would contain the following functional areas:  
6

- 7 • The Radiation Monitoring Room would separate the uncontaminated areas from the  
8 potentially contaminated areas of the proposed plant. It would include personnel radiation  
9 monitoring equipment, hand-washing facilities, and safety showers.  
10
- 11 • The Laundry Sorting Room would be used to sort potentially contaminated and soiled  
12 clothing and similar articles according to their level of contamination for either disposal or  
13 laundering onsite or offsite.  
14
- 15 • The Solid Waste Collection Room would be used for processing wet and dry low-level solid  
16 waste.  
17
- 18 • The Liquid Effluent Collection and Treatment Room would be used to collect, monitor, and  
19 treat potentially contaminated liquid effluents produced onsite.  
20
- 21 • The Truck Bay/Shipping and Receiving Area would be used to load and ship low-level  
22 radioactive and hazardous wastes to licensed treatment and disposal facilities.  
23
- 24 • The Gaseous Effluent Ventilation System would be used to remove uranium and other  
25 radioactive particles and hydrogen fluoride from the potentially contaminated process gas  
26 streams.  
27
- 28 • The Decontamination Workshop would provide a facility for removing radioactive  
29 contamination from contaminated materials and equipment.  
30
- 31 • Other workshops would provide space for maintenance of chemical traps, mobile vacuum  
32 pump skids, valves, and pumps.  
33
- 34 • The Maintenance Facility would provide space for the normal maintenance of contaminated  
35 equipment used at the proposed EREF, as well as all instrument and control equipment,  
36 lighting, power, and associated processes and pipe work.  
37
- 38 • The Laboratory Areas contain rooms for the receipt, preparation, analysis, and storage of  
39 various samples. A number of chemical analysis methods used for uranium isotope  
40 measurement and UF<sub>6</sub> quality assurance are available including mass spectrometry, atomic  
41 emission spectroscopy, alpha/beta/gamma counting, and gas Fourier transform infrared  
42 spectrometry.  
43

44 **Operation Support Building**  
45

46 The Operation Support Building would be located next to the Technical Support Building and  
47 would provide nonradiological support functions for the proposed EREF. This building would  
48 contain the following functional areas:  
49

- 1 • The Control Room would be the main monitoring point for the entire plant and provide all of  
2 the facilities for the control of the plant.  
3
- 4 • The Security Alarm Center would be the primary security monitoring station for the proposed  
5 facility. All electronic security systems would be controlled and monitored from this center.  
6
- 7 • Workshops for the maintenance and repair of uncontaminated plant equipment would be  
8 provided. The Vacuum Pump Rebuild Workshop would service pumps and other  
9 miscellaneous equipment. The Mechanical, Electrical, and Instrumentation Workshop would  
10 service pump motors, all instrument and control equipment, lighting, power, and associated  
11 process and services pipe work.  
12
- 13 • The Medical Room would provide space for a nurse's station and room for medical  
14 examinations.  
15
- 16 • The Environmental Laboratory Area would provide rooms and space for various laboratory  
17 areas that receive, prepare, and store various samples.  
18

### **Electrical and Mechanical Services Buildings**

19  
20  
21 The Electrical Services Building would be adjacent to the north side of the SBMs, housing four  
22 standby diesel generators. Building heating, ventilation, and air-conditioning equipment as well  
23 as switchgears and control panels would be housed in the building.  
24

25 The Mechanical Services Building would be located south of the SBMs, housing air  
26 compressors, demineralized water systems, and the centrifuge cooling water system pumps,  
27 heat exchangers, and expansion tanks.  
28

### **Administration Building**

29  
30  
31 The Administration Building would contain general office areas. All personnel access to the  
32 proposed EREF would occur through the Administration Building.  
33

### **Visitor Center**

34  
35  
36 The Visitor Center would be located outside the security fence close to US 20.  
37

### **Security and Secure Administration Building**

38  
39  
40 The Security and Secure Administration Building would be near the Administration Building.  
41 The building would contain secure office areas and would provide the only access (the Entry  
42 Exit Control Point) to the inside areas of the proposed EREF. Personnel must first pass through  
43 the Administration Building to gain access to the Security and Secure Administration Building.  
44  
45

1 **2.1.3.2 Utilities**

2  
3 The proposed EREF would require the installation of water and electrical utility lines. Natural  
4 gas will not be used. Sanitary waste would be treated in a packaged domestic Sanitary Sewage  
5 Treatment Plant.  
6

7 Water for the proposed facility would be provided from onsite groundwater wells. The proposed  
8 EREF's water requirement is expected to be approximately 24,900 cubic meters per year  
9 (6,570,000 gallons per year) in support of plant operations. Of this, approximately 2100 cubic  
10 meters per year (554,800 gallons per year) would be consumed by plant processes and  
11 22,800 cubic meters per year (6,023,000 gallons per year) would be used for potable water  
12 (AES, 2010a).  
13

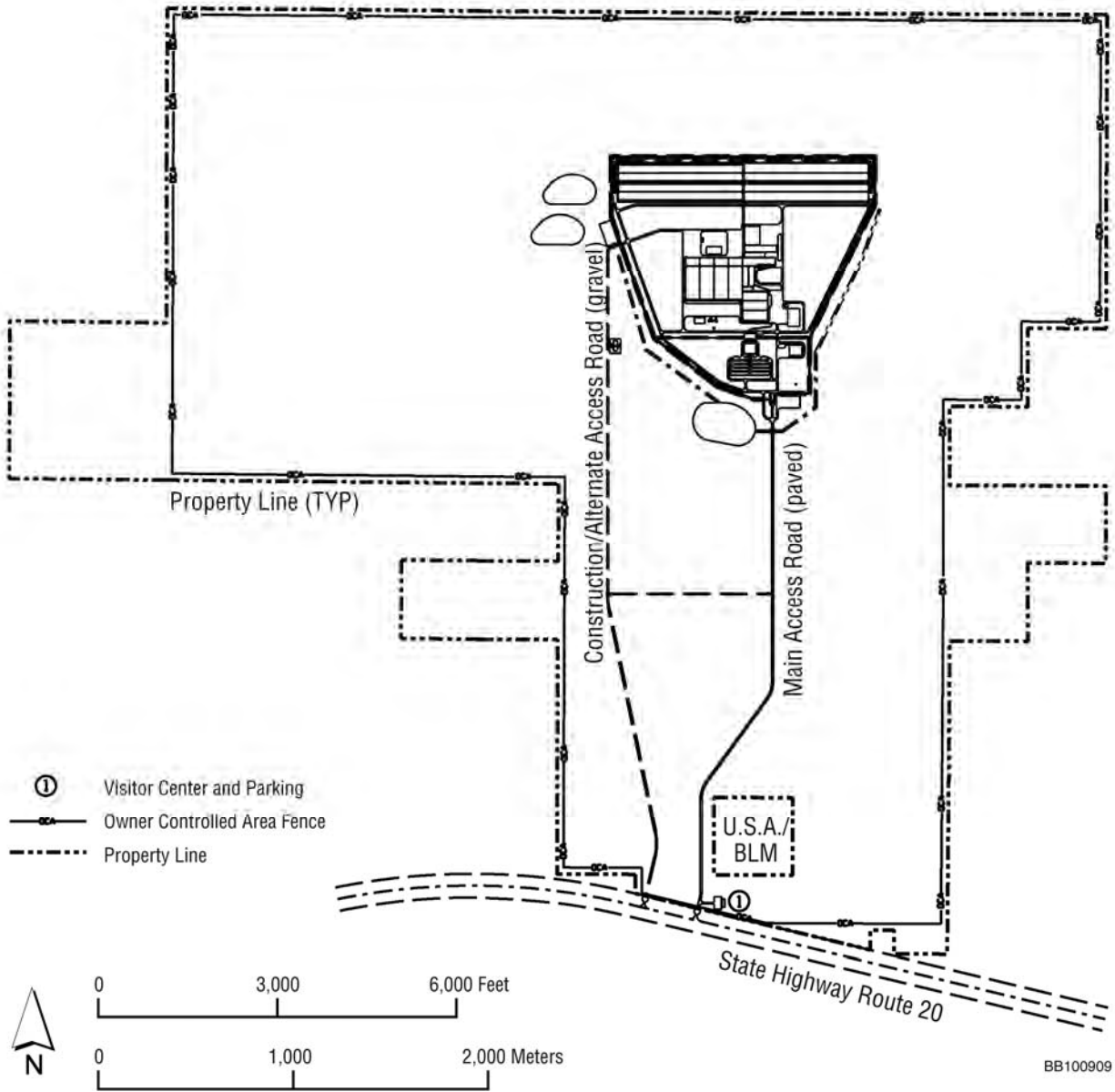
14 The proposed EREF is anticipated to require approximately 64 megavolt-amperes (MVA) of  
15 power when all cascades are in operation (AES, 2010a). A new 161-kV electrical transmission  
16 line would be run from the existing Bonneville Substation approximately 16 kilometers (10 miles)  
17 east of the proposed EREF site (AES, 2010a). The new transmission line and associated  
18 structures would be located entirely on private land within Bonneville County. Rocky Mountain  
19 Power, a division of PacifiCorp, will be the builder, owner, and operator. The line would extend  
20 west from the Bonneville Substation 14.5 kilometers (9 miles) to the Kettle Substation,  
21 continuing an additional 1.2 kilometers (0.75 mile) to the west to the proposed EREF property.  
22 Once on the property, the transmission line would go to the north and then circle to the west and  
23 south around the proposed EREF site to the proposed new Twin-Buttes Substation, which  
24 would be adjacent to the proposed EREF site. The entire length of the transmission line would  
25 be approximately 22.1 kilometers (13.8 miles) (AES, 2010a).  
26

27 A packaged sanitary sewage treatment system (Domestic Sanitary Sewage Treatment Plant)  
28 would be installed onsite for the collection and treatment of sanitary and uncontaminated liquid  
29 wastes. Residual treated effluent from the system would be discharged to the two single-lined  
30 Cylinder Storage Pads Stormwater Retention Basins where it would evaporate. The total  
31 annual discharge from the system is expected to be approximately 18,700 cubic meters per  
32 year (4,927,500 gallons per year) (AES, 2010a). This sanitary discharge source is not expected  
33 to contain any uranic material. Solid sanitary wastes from the treatment system would be  
34 temporarily stored in a holding tank and disposed of at an approved offsite location.  
35

36 **2.1.3.3 Local Road Network**

37  
38 The proposed EREF property lies immediately north of US 20, approximately 32 kilometers  
39 (20 miles) west of Idaho Falls and the junction of US 20 and Interstate 15 (I-15). US 20 extends  
40 from Idaho Falls in the east to the junction with US 26 northwest of Atomic City. The proposed  
41 EREF property lies along this route where US 20 is a two-lane highway. Access to the  
42 proposed EREF site would be from two planned access roads to US 20 (see Figure 2-6). All  
43 traffic to and from the proposed EREF (for construction, employees, and shipments) would use  
44 one of these access roads (AES, 2010a). Controlled and public access to these roads has yet  
45 to be determined by AES.  
46

47 The primary shipping route for all of the proposed EREF's incoming and outgoing truck  
48 shipments would be eastbound US 20 to its intersection with I-15, which is the major



1  
2 **Figure 2-6 Site Plan for the Proposed Eagle Rock Enrichment Facility (AES, 2010a)**

3  
4 north-south access to the region. The nearest interstate highway access to the west would be  
5 I-84, which intersects US 20 approximately 296 kilometers (184 miles) away from the proposed  
6 site. Idaho Falls is also served by US 26 and US 91.

7  
8 **2.1.4 Description of the Phases of the Proposed Action**

9  
10 As discussed previously, the proposed action would be conducted in three phases:  
11 (1) preconstruction and construction, (2) facility operation, and (3) decontamination and  
12 decommissioning. Each of these phases is described in the following sections. The general  
13 site plan is shown in Figure 2-6.



1 **2.1.4.1 Preconstruction and Construction Activities**

2  
3 **Preconstruction**

4  
5 As discussed in Section 1.4.1, the NRC has approved an exemption request from AES  
6 (AES, 2009) to conduct certain preconstruction activities prior to the NRC issuing a license to  
7 AES for the construction, operation, and decommissioning of the proposed EREF. The  
8 exemption (NRC, 2010a) covers the following activities and facilities:

- 9  
10 • clearing the site (e.g., removal of vegetation and debris)
- 11  
12 • site grading and erosion control
- 13  
14 • excavating the site including rock blasting and removal
- 15  
16 • installing parking areas
- 17  
18 • constructing the stormwater detention pond
- 19  
20 • constructing two highway access roadways and site roads
- 21  
22 • installing utilities (e.g., temporary and permanent power) and storage tanks
- 23  
24 • installing fences for investment protection (not used to implement the Physical Security  
25 Plan)
- 26  
27 • installing construction buildings, offices (including construction trailers), warehouses, and  
28 guardhouses

29  
30 Conventional earthmoving and grading equipment would be used to clear and grade the site. In  
31 some areas, blasting and rock excavation may be required. Preconstruction for the proposed  
32 EREF would affect approximately 240 hectares (592 acres) on the 1700-hectare (4200-acre)  
33 proposed property. The disturbed area would consist of 186 hectares (460 acres) for  
34 construction activities (see below), including future permanent plant structures, and an  
35 additional 53.6 hectares (132.5 acres) for temporary construction facilities, parking areas,  
36 material storage, and excavated areas for underground utilities. The total disturbed area would  
37 be cleared of vegetation, and approximately 164.9 hectares (407.5 acres) would be graded.  
38 Grading would include cutting and filling approximately 778,700 cubic meters (27,500,000 cubic  
39 feet) of soil (AES, 2010a).

40  
41 **Facility Construction**

42  
43 Facility construction would encompass the erection of the SBMs and facility support structures  
44 described in Section 2.1.3. All major facility support structures would be constructed in the first  
45 3 years (2011–2013). The first SBM would be completed in 2014, and heavy construction  
46 would continue into 2018 when the second SBM would become operational. During this period  
47 of heavy construction (2011–2018), typical building construction activities would take place  
48 involving the construction trades and associated truck deliveries of concrete, steel and steel



1 reinforcement, wiring, piping, and other building materials. Scrap pieces of construction debris  
2 would be trucked offsite to local landfills. Hazardous waste would be sent to an appropriately  
3 licensed facility for treatment and disposal.

4  
5 By early 2018, SBMs 1 and 2 would be fully operational and the building shells for SBMs 3 and  
6 4 would have been erected. After 2018, truck delivery of centrifuge components would occur  
7 during the latter phase of construction as centrifuges are installed in the remaining SBMs with  
8 completion of the last SBM in 2022.

9  
10 Temporary construction buildings and warehouses would be removed after facility construction  
11 is complete. Also, temporary construction areas, such as laydown areas, would be restored at  
12 this time.

#### 13 14 **2.1.4.2 Facility Operation**

15  
16 The proposed EREF would be constructed in stages to allow enrichment operations to begin  
17 while additional Cascade Halls are still under construction. Facility operation would commence  
18 with limited production after the completion of the first cascade. This ramped production  
19 schedule would allow the proposed facility to begin operation only 3 years after the license is  
20 issued. Production of enriched UF<sub>6</sub> product would increase from approximately 825,000 SWUs  
21 in the third year to a maximum of 6.6 million SWUs by the 10th year and start to ramp down  
22 again in the 24th year (AES, 2010a).

23  
24 At full production, the proposed EREF would employ an estimated 550 full-time workers and  
25 receive up to 17,518 metric tons (19,310 tons) per year, in up to 1424 Type 48Y cylinders, of  
26 UF<sub>6</sub> feed material containing a concentration of 0.72 percent by weight of the uranium-235  
27 isotope (AES, 2010a). The natural UF<sub>6</sub> feed material would be processed by the cascades to  
28 generate up to 2252 metric tons (2482 tons) of low-enriched UF<sub>6</sub> product and 15,270 metric tons  
29 (16,832 tons) of depleted UF<sub>6</sub> material each year.

30  
31 The subsections below discuss operations in detail, including receipt of UF<sub>6</sub> feed material,  
32 generation of UF<sub>6</sub> product, shipping UF<sub>6</sub> product, generation rate of depleted UF<sub>6</sub> tails, and  
33 supporting production process systems.

#### 34 35 **Receiving UF<sub>6</sub> Feed Material**

36  
37 The natural feed material would be shipped to the proposed EREF in standard Type 48Y  
38 cylinders. This cylinder is a U.S. Department of Transportation-approved container for  
39 transporting Type A material (DOE, 1999a). The radioactive materials transported in this  
40 container are subject to 10 CFR Part 71 and 49 CFR Parts 171 to 173 shipping regulations.  
41 These regulations include requirements for an internal pressure test without leakage, free drop  
42 test without loss or dispersal of UF<sub>6</sub>, and thermal test requirements without rupture of the  
43 containment system. In addition, shipments would be required to have fissile controls. A fully  
44 loaded Type 48Y cylinder contains approximately 12 metric tons (14 tons) of material and is  
45 shipped one per truck (DOE, 1999b). After receipt and inspection, the cylinder could be stored  
46 until needed or connected to the gas centrifuge cascade at one of several feed stations  
47 discussed in the next section. Once installed in the feed station, the transport cylinders would

1 be heated to sublime the solid UF<sub>6</sub> into a gas that would be fed to the gas centrifuge enrichment  
2 cascade.

3  
4 AES anticipates receiving feed cylinders at the proposed EREF from U.S. and foreign origins.  
5 In the United States, the UF<sub>6</sub> production facility is located in Metropolis, Illinois. The proposed  
6 EREF would receive feed cylinders from foreign UF<sub>6</sub> production facilities through ports in  
7 Baltimore, Maryland; and Portsmouth, Virginia; as well as from Port Hope, Ontario, Canada.

8  
9 After each feed cylinder has been emptied, it would be inspected and processed for reuse. The  
10 proposed EREF would have the capability to provide for internal cleaning or decontamination of  
11 the cylinders in the Blending, Sampling, and Preparation Building. This capability is intended for  
12 preparation of the 30B enriched product cylinders, but could be used for empty feed cylinders if  
13 necessary (AES, 2010a). The empty Type 48Y feed cylinders would be used as tails cylinders  
14 to store depleted UF<sub>6</sub> material on the Cylinder Storage Pads or would be returned to the  
15 supplier (empty feed cylinder with a “heel”).

### 16 17 **Producing Enriched UF<sub>6</sub> Product**

18  
19 The enrichment process would begin with sublimation of the solid UF<sub>6</sub> into the gas phase and  
20 purification of the gaseous UF<sub>6</sub>. The UF<sub>6</sub> would then be routed through the centrifuge cascades  
21 where enriched and depleted streams would be created, as discussed in Section 2.1.2. The  
22 enriched product stream and the depleted waste stream would exit the cascades separately and  
23 would be desublimed (solidified) in their respective systems. These four major elements of the  
24 enrichment process would occur in the following systems contained in the SBMs (AES, 2010b):

- 25  
26 • UF<sub>6</sub> Feed System  
27  
28 • Cascade System  
29  
30 • Product Take-off System  
31  
32 • Tails Take-off System  
33

34 In the UF<sub>6</sub> Feed System, feed cylinders would be loaded into Solid Feed Stations, vented for  
35 removal of light gases, primarily air and hydrogen fluoride (HF), and heated to sublime the UF<sub>6</sub>.  
36 The light gases and UF<sub>6</sub> gas generated during feed purification would be routed to the Feed  
37 Purification Subsystem where the UF<sub>6</sub> would be desublimed in cold traps and the HF would be  
38 captured in chemical traps. The UF<sub>6</sub> would be then sublimed again and routed into the cascade  
39 system.

40  
41 After sublimation and purification, the UF<sub>6</sub> would be routed through the centrifuge cascades in  
42 the Cascade System. As discussed in Section 2.1.2, each centrifuge has a thin-walled, vertical,  
43 cylindrically shaped rotor that spins around a central post within an outer casing. Feed, product,  
44 and tails streams would enter and leave the centrifuge through the central post. Control valves,  
45 restrictor orifices, and controllers would provide uniform flow of product and tails.

46  
47 Depleted UF<sub>6</sub> exiting the cascades would be transported from the high vacuum of the centrifuge  
48 for desublimation into Type 48Y tails cylinders at subatmospheric pressure. This process would

1 occur in the Tails Take-off System. The primary equipment in this system includes vacuum  
2 pumps and the Tails Low Temperature Take-off Stations (LTTS). Chilled air would flow over  
3 cylinders in the Tails LTTS to effect the desublimation. Filling of the Type 48Y cylinders would  
4 be monitored with a load cell system, and filled cylinders would be transferred outdoors to the  
5 Full Tails Cylinder Storage Pad.  
6

7 In the Product Take-off System, enriched UF<sub>6</sub> from the cascades – low-enriched product  
8 between 3 and 5 percent by weight of the uranium-235 isotope – would be desublimed into Type  
9 30B product cylinders. The Product Take-off System consists of vacuum pumps, product LTTS,  
10 UF<sub>6</sub> cold traps, and vacuum pump/chemical trap sets. The pumps would transport the UF<sub>6</sub> from  
11 the cascades to the Product LTTS at subatmospheric pressure. The heat of desublimation of  
12 the UF<sub>6</sub> would be removed by cooling air routed through the LTTS. The product stream  
13 normally would contain small amounts of light gases that may have passed through the  
14 centrifuges. Therefore, a UF<sub>6</sub> cold trap and vacuum pump/trap set would be provided to vent  
15 these gases from the Type 30B product cylinder. Any UF<sub>6</sub> captured in the cold trap is  
16 periodically transferred to another product cylinder for use as product or blending stock. Filling  
17 of the product cylinders would be monitored with a load cell system, and filled cylinders would  
18 be transferred to the Product Liquid Sampling System for sampling.  
19

20 Blending stock would be used in the Product Blending System, which would be used to produce  
21 enrichment levels other than those produced in any given Cascade Hall. The system would  
22 contain donor stations for two donor cylinders of different assays and a receiver station.  
23 Operation of the donor and receiver stations would be similar to that for the Solid Feed Stations  
24 and the LTTS, respectively. The Product Liquid Sampling System would use autoclaves to  
25 liquefy the UF<sub>6</sub> in Type 30B product cylinders. Samples would be extracted from each cylinder  
26 to verify the product assay level (weight percent uranium-235).  
27

28 Supporting functions of the enrichment process would include sample analysis, equipment  
29 decontamination and rebuild, liquid effluent treatment, and solid waste management. All gas-  
30 phase processes would be conducted at subatmospheric pressures to mitigate hazards, should  
31 a break in the process lines or equipment occur.  
32

### 33 **Shipping Enriched Product**

34  
35 Enriched UF<sub>6</sub> product would be shipped in a Type 30B cylinder, which is 76 centimeters  
36 (30 inches) in diameter and 206 centimeters (81 inches) long and holds a maximum of  
37 2.3 metric tons (2.5 tons) of 5-percent enriched <sup>235</sup>UF<sub>6</sub>. Figure 2-7 shows Type 30B enriched  
38 product cylinders and overpacks loaded for transport. At full production, the proposed EREF  
39 would produce approximately 1032 enriched product cylinders annually for shipment to  
40 customers. Potential customers are fuel fabrication facilities in Richland, Washington;  
41 Columbia, South Carolina; Wilmington, North Carolina; and overseas through ports at  
42 Portsmouth, Virginia, and Baltimore, Maryland.  
43

### 44 **Depleted UF<sub>6</sub> Generation**

45  
46 During operation of the proposed EREF, the production of depleted UF<sub>6</sub> material would increase  
47 from 1909 metric tons (2105 tons) per year during initial production to 15,267 metric tons  
48 (16,830 tons) per year during peak production. This material would fill between 153 and



1  
2 **Figure 2-7 Truck Loaded with Five 30B Enriched Product Cylinders**  
3 **Loaded for Transport in Their Protective Overpacks**  
4 **(DOE, undated b)**  
5

6 1222 Type 48Y cylinders per year. Table 2-2 shows the potential maximum expected quantity  
7 of cylinders that would be filled with depleted  $UF_6$  material each year during the anticipated life  
8 of the proposed EREF. The values presented reflect the sequential startup and shutdown of the  
9 cascades.

10  
11 **Production Process Support Systems**  
12

13 Enriched  $UF_6$  would be the primary product of the proposed EREF. Production of enriched  $UF_6$   
14 would require the safe operation of multiple plant support systems to ensure the safe operation  
15 of the proposed facility. The supporting process systems required for the safe and efficient  
16 production of enriched  $UF_6$  product would include the following (AES, 2010b):  
17

- 18 • Gaseous Effluent Ventilation Systems (GEVSS)
- 19
- 20 • Liquid Effluent Collection and Treatment System
- 21
- 22 • Centrifuge Test and Postmortem Facilities Exhaust Filtration System
- 23
- 24 • Solid Waste Collection System
- 25
- 26 • Decontamination System
- 27

28 **Gaseous Effluent Ventilation Systems**  
29

30 Gaseous effluent ventilation systems for each SBM and for the Technical Services Building  
31 would be designed to collect the potentially contaminated gaseous effluent streams in the plant  
32 and treat them before discharge to the atmosphere. Each system would route these streams  
33 through a filter system prior to exhausting out a vent stack, which would contain a continuous

**Table 2-2 Depleted UF<sub>6</sub> Tails Generation<sup>a</sup>**

<b>Years (number after license is issued)</b>	<b>Annual Number of 48Y Tails Cylinders</b>	<b>Cumulative Number of 48Y Tails Cylinders</b>
1	0	0
2	0	0
3	153	153
4	306	459
5	459	918
6	611	1529
7	764	2293
8	917	3210
9	1069	4279
10 to 23	1222	5501 to 21,387
24	1069	22,456
25	917	23,373
26	764	24,137
27	611	24,748
28	459	25,207
29	306	25,513
30	166	25,679
31	26	25,705
32	13	25,718

<sup>a</sup> Note that the tails generation provided by AES is conservative in that it provides a maximum number of tails cylinders that could be produced over the lifetime of the proposed EREF. It is based on a 30-year production life with appropriate ramp-up/ramp-down in capacity rather than an actual 30-year license period which includes the time necessary to first construct the proposed facility. In reality, AES would not be producing additional tails cylinders beyond 30 years after a license is issued and may start the ramp-down sooner than 24 years after the license is issued.

Source: AES, 2010b.

1  
2

1 monitor to measure radioactivity level (alpha) and HF levels. The GEVS for SBM 1 would also  
2 serve the Blending, Sampling, and Preparation Building.

3  
4 Each gaseous effluent vent system would transport potentially contaminated gases through a  
5 subatmospheric duct network to a set of redundant filters (a pre-filter, a high-efficiency  
6 particulate air [HEPA] filter, an activated carbon filter impregnated with potassium carbonate,  
7 and another HEPA filter) and fans. The cleaned gases would be discharged to the atmosphere  
8 via rooftop stacks. The fan would maintain an almost constant subatmospheric pressure in front  
9 of the filter section by means of a differential pressure controller.

#### 10 11 Liquid Effluent Systems

12  
13 The Liquid Effluent Collection and Treatment System would collect potentially contaminated  
14 liquid effluents generated in a variety of plant operations and processes. These liquid effluents  
15 would be collected and stored in tanks prior to processing. The effluent input streams would  
16 include hydrolyzed UF<sub>6</sub>, degreaser water, citric acid, floor wash water, and miscellaneous  
17 effluent. The contaminated liquids would be processed for uranium removal through several  
18 precipitation units, filtration units, microfiltration units, and evaporation units. The final step  
19 would use an evaporation process that discharges clean steam to the atmosphere. Any  
20 resulting solid waste would be shipped offsite for disposal at an approved facility.

#### 21 22 Centrifuge Test and Postmortem Facilities Exhaust Filtration System

23  
24 The Centrifuge Test and Postmortem Facilities Exhaust Filtration System would exhaust  
25 potentially hazardous contaminants from the Centrifuge Test and Postmortem Facilities. The  
26 system would also ensure the Centrifuge Postmortem Facility is maintained at a negative  
27 pressure with respect to adjacent areas.

28  
29 The ductwork would be connected to a one-filter station and would exhaust through a fan. The  
30 filter station and fan would be able to handle 100 percent of the effluent exhaust. Activities that  
31 require the Centrifuge Test and Postmortem Facilities Exhaust Filtration System to be  
32 operational would be manually stopped if the system fails or shuts down. After filtration, the  
33 clean gases would be discharged through the monitored exhaust stack on the Centrifuge  
34 Assembly Building. The Centrifuge Assembly Building exhaust stack would be monitored for  
35 hydrogen fluoride and alpha radiation.

#### 36 37 Solid Waste Collection System

38  
39 In addition to the depleted UF<sub>6</sub>, operation of the proposed EREF would generate other  
40 radioactive and nonradioactive solid wastes. Solid waste would be segregated and processed  
41 based on its classification as wet-solid or dry-solid wastes and segregated into radioactive,  
42 hazardous, or mixed-waste categories. Wet solid waste would include wet trash (waste paper,  
43 packing material, rags, wipes, etc.), oil-recovery sludge, oil filters, miscellaneous oils (such as  
44 cutting machine oils), solvent recovery sludge, and uranic waste precipitate. Dry solid waste  
45 would include trash (combustible and nonmetallic items), activated carbon, activated alumina,  
46 activated sodium fluoride, HEPA filters, scrap metal, laboratory waste, and dryer concentrate.



1 Radioactive solid waste would be sent to a licensed low-level radioactive waste disposal facility.  
2 AES is considering options that include shipping its low-level radioactive waste to a treatment  
3 facility in Oak Ridge, Tennessee, and disposal sites near Richland, Washington, and Clive,  
4 Utah. Material that would be classified as mixed waste may also be handled at the Oak Ridge,  
5 Tennessee, and Clive, Utah, facilities. Nonradioactive and nonhazardous wastes – including  
6 office and warehouse trash such as wood, paper, and packing materials; scrap metal and  
7 cutting oil containers; and building ventilation filters – would be sent to a commercial landfill for  
8 disposal. Hazardous wastes would be sent to an appropriately licensed facility for treatment  
9 and disposal.

## 10 Decontamination System

11  
12  
13 The Decontamination System would be designed to remove radioactive contamination from  
14 centrifuges, pipes, instruments, and other potentially contaminated equipment. The system  
15 would contain equipment and processes to disassemble, clean and degrease, decontaminate,  
16 and inspect plant equipment. Scrap and waste material from the decontamination process  
17 would be sent to the Solid Waste Collection System or the Liquid Effluent Collection and  
18 Treatment System for segregation and treatment prior to offsite disposal at a licensed facility.  
19 Exhaust air from the decontamination system area would pass through the gaseous effluent  
20 ventilation systems before discharge to the atmosphere.

### 21 **2.1.4.3 Decontamination and Decommissioning**

22  
23  
24 The proposed EREF would be licensed to operate for 30 years. At the end of this period, unless  
25 AES files a timely application for license renewal, the proposed EREF would be decontaminated  
26 and decommissioned in accordance with applicable NRC license termination requirements. The  
27 intent of decommissioning is to return the entire proposed EREF site to levels suitable for  
28 unrestricted use in accordance with 10 CFR 20.1402 requirements (AES, 2010a).  
29 Decontamination and decommissioning is projected to take 9 years, beginning in 2032 with  
30 completion expected in 2041. The SBMs would be decommissioned in the first 8 years, and  
31 there would be one additional year for final site surveys and activities (AES, 2010b). SBM 1 is  
32 scheduled to be the first to operate and would be the first to undergo decontamination and  
33 decommissioning. Decontamination and decommissioning of the other SBMs would follow in  
34 turn. SBM 4 would be the last module to operate and to be decommissioned. The remaining  
35 plant systems and buildings would be decommissioned after final shutdown of SBM 4  
36 (AES, 2010b). All proprietary equipment and radiologically contaminated components would be  
37 removed, decontaminated, and shipped to a licensed disposal facility. The buildings, structures,  
38 and selected support systems would be cleaned and released for unrestricted use.

39  
40 Decontamination and decommissioning of the proposed EREF would be funded in accordance  
41 with the Decommissioning Funding Plan (DFP) for the proposed EREF (AES, 2010b). The  
42 DFP, prepared by AES in accordance with 10 CFR 70.25(a) and the guidance in NUREG-1757  
43 (NRC, 2006), would provide information required by 10 CFR 70.25(e) regarding AES's plans for  
44 funding the decommissioning of the proposed EREF and the disposal of depleted uranium tails  
45 generated as a result of plant operations. Funding would be provided by AES by means of a  
46 Letter of Credit in accordance with NRC regulations in 10 CFR Part 70 and guidance in  
47 NUREG-1757 (NRC, 2006).

1 Decontamination and decommissioning activities for the proposed EREF are anticipated to  
2 occur more than 20 years in the future, and therefore only a general description of the activities  
3 that would be conducted can be developed at this time for the EIS. The proposed facility would  
4 follow NRC decommissioning requirements in 10 CFR 70.38.

5  
6 Decommissioning of a facility such as the proposed EREF would generally include the following  
7 activities:

- 8
- 9 • installation of decontamination facilities
- 10
- 11 • purging of process systems and equipment
- 12
- 13 • dismantling and removal of facilities and equipment
- 14
- 15 • decontamination and destruction of confidential materials
- 16
- 17 • decontamination of equipment, facilities, and structures
- 18
- 19 • survey and spot decontamination of outdoor areas
- 20
- 21 • removal and sale of any salvaged materials
- 22
- 23 • removal and disposal of wastes
- 24
- 25 • management and disposal of depleted uranium
- 26
- 27 • final radiation survey to confirm that the release criteria have been met
- 28

29 At the end of the useful life of each SBM, the enrichment process equipment would be shut  
30 down and UF<sub>6</sub> removed to the fullest extent possible by normal process operation. This would  
31 be followed by evacuation and purging with nitrogen. The shutdown and purging portion of the  
32 decommissioning process would take approximately 3 months for each cascade.

### 33 34 **Decontamination Facilities**

35  
36 New decontamination facilities would be constructed in existing site buildings such as the  
37 Centrifuge Assembly Building prior to shutdown of SBM 1. The decontamination facilities would  
38 provide specialized handling of the thousands of centrifuges along with the UF<sub>6</sub> vacuum pumps  
39 and valves.

40  
41 Contaminated plant components would be cut up or dismantled and then processed through the  
42 decontamination facilities. Contamination of site structures would be limited to areas in the  
43 Separations Building Modules and Technical Services Building, and would be maintained at low  
44 levels throughout plant operation by regular surveys and cleaning. The use of special sealing  
45 and protective coatings on porous and other surfaces that might become radioactively  
46 contaminated during operation would simplify the decontamination process, and the use of  
47 standard good-housekeeping practices during operation of the proposed facility would ensure

1 that final decontamination of these areas would require minimal removal of surface concrete or  
2 other structural material.

### 3 4 **Dismantling the Facility**

5  
6 Dismantling would require cutting and disconnecting all components requiring removal. The  
7 activities would be simple but very labor-intensive and would generally require the use of  
8 protective clothing. The work process would be optimized through consideration of the following  
9 measures:

- 10  
11 • minimizing the spread of contamination and the need for protective clothing  
12  
13 • balancing the number of cutting and removal operations with the resultant decontamination  
14 and disposal requirements  
15  
16 • optimizing the rate of dismantling with the rate of decontamination facility throughput  
17  
18 • providing storage and laydown space as required for effective workflow, criticality, safety,  
19 security, etc.  
20  
21 • balancing the cost of decontamination and salvage with the cost of disposal

22  
23 To avoid laydown space and contamination problems, dismantling would proceed generally no  
24 faster than the downstream decontamination process.

25  
26 Items to be removed from the facilities would be categorized as potentially reusable equipment,  
27 recoverable scrap, and wastes. However, operating equipment would not be assumed to have  
28 reuse value after 30 years of operation. Wastes would also have no salvage value.

29  
30 A significant amount of scrap aluminum, steel, copper, and other metals would be recovered  
31 during the disassembly of the enrichment equipment. For security and convenience, the  
32 uncontaminated materials would likely be shredded or smelted to standard ingots and, if  
33 possible, sold at market price. The contaminated materials would be disposed of as low-level  
34 radioactive waste.

35  
36 Prompt decontamination or removal of all materials from the proposed site that would prevent  
37 release of the facility for unrestricted use would be performed. This approach would avoid long-  
38 term storage and monitoring of radiological and hazardous wastes onsite. All of the enrichment  
39 equipment would be removed, and only the building shells and site infrastructure would remain.  
40 All remaining facilities would be decontaminated to levels that would allow for unrestricted use.

### 41 42 **Disposal**

43  
44 All wastes produced during decontamination and decommissioning would be collected, handled,  
45 and disposed of in a manner similar to that described for those wastes produced during normal  
46 operation. Wastes would consist of normal industrial trash, nonhazardous chemicals and fluids,  
47 small amounts of hazardous materials, and radioactive wastes. Radioactive wastes would

1 consist primarily of crushed centrifuge rotors, trash, and citric cake. Citric cake consists of  
2 uranium and metallic compounds precipitated from citric acid decontamination solutions.

3  
4 Radioactive wastes would ultimately be disposed of in licensed low-level radioactive waste  
5 disposal facilities. Hazardous wastes would be disposed of in licensed hazardous waste  
6 disposal facilities. Nonhazardous and nonradioactive wastes would be disposed of in a manner  
7 consistent with good industrial practice and in accordance with applicable regulations. A  
8 complete estimate of the wastes and effluent to be produced during decommissioning would be  
9 provided in the Decommissioning Plan that AES would submit prior to the start of the  
10 decommissioning.

### 11 12 **Final Radiation Survey**

13  
14 A final radiation survey would verify complete decontamination of the proposed EREF prior to  
15 allowing the proposed site to be released for unrestricted use. The evaluation of the final  
16 radiation survey would be based in part on an initial radiation survey performed prior to initial  
17 operation. The initial site radiation survey would determine the natural background radiation  
18 levels in the area of the proposed EREF, thereby providing a benchmark for identifying any  
19 increase in radioactivity levels in the area. The final survey would measure radioactivity over  
20 the entire site and compare it to the original benchmark survey. The intensity of the survey  
21 would vary depending on the location (i.e., the buildings, the immediate area around the  
22 buildings, and the remainder of the site). A final radiation survey report would document the  
23 survey procedures and results, and would include, among other things, a map of the survey of  
24 the proposed site, measurement results, and a comparison of the proposed EREF site's  
25 radiation levels to the surrounding area. The  
26 results would be analyzed to show that they  
27 were below allowable residual radioactivity  
28 limits; otherwise, further decontamination  
29 would be performed.

### 30 31 **2.1.5 Depleted Uranium Management**

32  
33 The term "depleted uranium" refers to any  
34 chemical form of uranium (e.g., UF<sub>6</sub> and  
35 U<sub>3</sub>O<sub>8</sub>) that contains uranium-235 in  
36 concentrations less than the 0.7 percent  
37 found in natural uranium. As discussed in  
38 Section 2.1.4.2, the uranium enrichment  
39 process would generate a depleted UF<sub>6</sub>  
40 stream (also called tails). In contrast to the  
41 uranium in the enriched UF<sub>6</sub> produced by the  
42 enrichment facility, the uranium in the  
43 depleted UF<sub>6</sub> stream would be depleted in  
44 the uranium-235 isotope of uranium. At full  
45 production, the proposed EREF would  
46 generate 15,270 metric tons per year  
47 (16,800 tons per year) of depleted UF<sub>6</sub>.  
48 Initially, the depleted UF<sub>6</sub> would be stored in

#### ***Waste Classification of Depleted Uranium***

*Depleted uranium is different from most low-level radioactive waste in that it consists mostly of long-lived isotopes of uranium, with small quantities of thorium-234 and protactinium-234. Depleted uranium is source material as defined in 10 CFR Part 40, and, if treated as a waste, it falls under the definition of low-level radioactive waste per 10 CFR 61.2. The Commission affirmed that depleted uranium is properly considered a form of low-level radioactive waste in Louisiana Energy Services, L.P. (National Enrichment Facility), CLI-05-5, 61 NRC 22 (January 18, 2005). This means that depleted uranium could be disposed of in a licensed low-level radioactive waste facility if the licensing requirements for land disposal of radioactive waste as indicated in 10 CFR Part 61 are met.*

*Sources: NRC, 1991, 2005b.*

1 Type 48Y cylinders on the Full Tails Cylinder Storage Pads (AES, 2010a). Each Type 48Y  
2 cylinder would hold approximately 12.5 metric tons (13.8 tons), which means that at full  
3 production the proposed site would generate approximately 1222 cylinders of depleted UF<sub>6</sub>  
4 every year. During the operation of the proposed facility, the plant could generate and store up  
5 to 25,718 cylinders of depleted UF<sub>6</sub> (AES, 2010a). AES would own the depleted UF<sub>6</sub> and  
6 maintain the cylinders while they are in storage. Maintenance activities would include periodic  
7 inspections for corrosion, valve leakage, and distortion of the cylinder shape, and touch-up  
8 painting as required. Problem cylinders would be removed from storage and the material  
9 transferred to another storage cylinder. The proposed storage area would be kept neat and free  
10 of debris, and all stormwater or other runoff would be routed to the Cylinder Storage Pad  
11 Stormwater Retention Basins for monitoring and evaporation.  
12

13 The Defense Nuclear Facilities Safety Board (DNFSB) has reported that long-term storage of  
14 depleted UF<sub>6</sub> in the UF<sub>6</sub> form represents a potential chemical hazard if not properly managed  
15 (DNFSB, 1995). For this reason, the strategic management of depleted uranium includes the  
16 conversion of depleted UF<sub>6</sub> stock to a more stable uranium oxide (e.g., triuranium octaoxide  
17 [U<sub>3</sub>O<sub>8</sub>]) form for long-term management (OECD, 2001). Also, the DOE evaluated multiple  
18 disposition options for depleted UF<sub>6</sub> and agreed that conversion to U<sub>3</sub>O<sub>8</sub> was preferable for long-  
19 term storage and disposal of the depleted uranium in its oxide form, due to the chemical stability  
20 of U<sub>3</sub>O<sub>8</sub> (DOE, 2000). Therefore, the disposal option considered in the EIS is the conversion of  
21 the depleted UF<sub>6</sub> to U<sub>3</sub>O<sub>8</sub> at either a DOE-owned or commercial conversion facility followed by  
22 disposal as U<sub>3</sub>O<sub>8</sub>. Direct disposal of depleted UF<sub>6</sub> was ruled out because of its chemical  
23 reactivity (DOE, 1999b).  
24

#### 25 **2.1.5.1 Conversion of Depleted UF<sub>6</sub>**

26  
27 AES has requested the DOE to accept all depleted UF<sub>6</sub> generated at the proposed EREF for  
28 conversion to the oxide form for disposal (AES, 2010a). This plan is based on Section 3113 of  
29 the 1996 *USEC Privatization Act*, 42 U.S.C. 2297h-11, which states the DOE “shall accept  
30 for disposal low-level radioactive waste, including depleted uranium if it were ultimately  
31 determined to be low-level radioactive waste, generated by ... any person licensed by the  
32 Nuclear Regulatory Commission to operate a uranium enrichment facility under section 53, 63,  
33 and 193 of the *Atomic Energy Act of 1954* (42 U.S.C. 2073, 2093, and 2243).” On January 18,  
34 2005, the Commission issued its ruling that depleted uranium is considered a form of low-level  
35 radioactive waste (NRC, 2005a). The Commission also stated that, pursuant to Section 3113 of  
36 the *USEC Privatization Act*, disposal at a DOE facility represents a “plausible strategy” for the  
37 disposition of depleted uranium tails (NRC, 2005a).  
38

39 DOE has constructed two conversion plants to convert the depleted UF<sub>6</sub> now in storage at  
40 Portsmouth, Ohio, and Paducah, Kentucky, to U<sub>3</sub>O<sub>8</sub> and hydrofluoric acid. Both plants are  
41 currently undergoing operational tests. The Portsmouth plant is expected to go into full  
42 operation in summer 2011, and the Paducah plant by early fall of 2011 (Sparks, 2011). AES  
43 would transport the depleted UF<sub>6</sub> generated by the proposed EREF to either of these new  
44 facilities and pay DOE to convert and dispose of the material. The proposed EREF would  
45 generate approximately 321,235 metric tons (354,101 tons) in total over its operating lifetime  
46 (AES, 2010a). The depleted UF<sub>6</sub> would be processed in a DOE-operated conversion facility and  
47 then shipped offsite for disposal.  
48



### **Depleted UF<sub>6</sub> Conversion Process**

*Depleted UF<sub>6</sub> conversion is a continuous process in which depleted UF<sub>6</sub> is vaporized and converted to U<sub>3</sub>O<sub>8</sub> by reaction with steam and hydrogen in a fluidized-bed conversion unit. The hydrogen is generated using anhydrous ammonia, although an option of using natural gas is being investigated. Nitrogen is also used as an inert purging gas and is released to the atmosphere through the building stack as part of the clean off-gas stream. The depleted U<sub>3</sub>O<sub>8</sub> powder is collected and packaged for disposition. The process equipment would be arranged in parallel lines. Each line would consist of two autoclaves, two conversion units, a hydrofluoric acid recovery system, and process off-gas scrubbers. The Paducah facility would have four parallel conversion lines. Equipment would also be installed to collect the hydrofluoric acid co-product and process it into any combination of several marketable products. A backup hydrofluoric acid neutralization system would be provided to convert up to 100 percent of the hydrofluoric acid to calcium fluoride for storage and/or sale in the future, if necessary.*

*Source: DOE, 2004a,b.*

1  
2  
3 In addition to the DOE disposition option for depleted UF<sub>6</sub>, one or more NRC-licensed  
4 commercial depleted UF<sub>6</sub> conversion facilities may become available during the proposed  
5 EREF's operational lifetime. One commercial entity (International Isotopes, Inc.) submitted a  
6 license application (International Isotopes, 2009) on December 31, 2009, to construct and  
7 operate a new depleted UF<sub>6</sub> "de-conversion" facility in Hobbs, New Mexico.

8  
9 The NRC staff is currently reviewing this application (NRC, 2010b). Although International  
10 Isotopes calls its process "de-conversion," it is similar to DOE's conversion process. If a  
11 commercial facility performs the conversion to U<sub>3</sub>O<sub>8</sub>, DOE is still obligated to accept the U<sub>3</sub>O<sub>8</sub>  
12 for disposal if requested by AES, per Section 3113 of the *USEC Privatization Act*.

#### **2.1.5.2 Disposal of Depleted Uranium**

13  
14  
15  
16 The Commission has stated that depleted uranium in any form (e.g., UF<sub>6</sub>, U<sub>3</sub>O<sub>8</sub>) is considered a  
17 form of low-level radioactive waste (NRC, 2005a). However, the chemical reactivity of depleted  
18 UF<sub>6</sub> precludes it from being a stable waste form, and thus makes it unsuitable for direct disposal  
19 without conversion (DOE, 1999b). As discussed in Section 2.1.5.1, AES has requested the  
20 DOE to accept all depleted UF<sub>6</sub> generated at the proposed EREF for conversion to the oxide  
21 form for disposal (AES, 2010a). After conversion of depleted uranium tails (depleted UF<sub>6</sub>) to  
22 U<sub>3</sub>O<sub>8</sub>, disposal of this U<sub>3</sub>O<sub>8</sub> at a commercial low-level waste disposal facility would be a viable  
23 option if the disposal facility meets the requirements of 10 CFR Part 61.

#### **2.2 No-Action Alternative**

24  
25  
26  
27 Under this alternative, AES would not construct, operate, and decommission the proposed  
28 EREF in Bonneville County, Idaho. Under the no-action alternative, the NRC assumes that the  
29 preconstruction activities that have been approved by exemption and are described in  
30 Section 2.1.4.1 will take place.

31



1 Under the no-action alternative, the uranium fuel fabrication facilities in the United States would  
2 continue to obtain low-enriched uranium from the currently available sources or potential new  
3 sources. As described in Section 1.3.1, the two currently available domestic sources of low-  
4 enriched uranium available to fuel fabricators are the Paducah Gaseous Diffusion Plant (PGDP)  
5 and the URENCO USA facility. Foreign enrichment sources are currently supplying as much as  
6 85 percent of U.S. nuclear power plants' demand.

7  
8 The Megatons to Megawatts Program will expire by 2013, potentially eliminating downblending  
9 as a source of low-enriched uranium (LEU) (DOE, 2010). The PGDP, which opened in 1952,  
10 uses gaseous diffusion technology, a process that is more energy intensive than newer  
11 technologies such as gas centrifuge. The NRC has already granted licenses to two commercial  
12 entities to construct and operate gas centrifuge enrichment facilities: the Louisiana Energy  
13 Services (LES) URENCO USA facility in New Mexico and the USEC American Centrifuge Plant  
14 (ACP) in Ohio. These two facilities are currently under construction and are designed to  
15 produce 3 million and 3.5 million SWUs per year, respectively, when complete and generating at  
16 full licensed capacity. However, the URENCO USA facility, while currently operating, is still  
17 under construction and is not expected to reach half of its currently licensed annual capacity of  
18 3 million SWUs until August 2011, and LES has yet to submit an application to the NRC for a  
19 potential expansion from 3 million to 5.9 million SWUs per year. In addition, the NRC is  
20 currently reviewing an application from GE-Hitachi Global Laser Enrichment, LLC to construct  
21 and operate the Global Laser Enrichment (GLE) Facility, a proposed laser-based enrichment  
22 facility that would be located in North Carolina. If the GLE Facility is licensed and constructed, it  
23 would produce enriched uranium with annual production levels of up to 6 million SWU annually.  
24 If the three facilities begin operations, this would represent a more efficient and less costly  
25 means of producing low-enriched uranium than the current gaseous diffusion technology at the  
26 PGDP.

### 27 28 **2.3 Alternatives Considered but Eliminated**

29  
30 As required by NEPA and NRC regulations, the NRC staff has considered alternatives to the  
31 proposed action of construction, operation, and decommissioning of the proposed EREF. The  
32 range of alternatives to the proposed action was determined by considering the underlying  
33 purpose and need for the proposed action. Specifically, the range of alternatives was  
34 determined by considering other ways to provide enriched uranium to fulfill electricity generation  
35 requirements and provide reliable and economic domestic supplies of enriched uranium for  
36 national energy security. This analysis led to the following set of alternatives:

- 37
- 38 • alternative sites other than the proposed Bonneville County site
- 39
- 40 • alternative sources of LEU
- 41
- 42 • alternative technologies available for uranium enrichment
- 43

44 These alternatives were considered but eliminated from further analysis based on economic,  
45 environmental, national security, or technological maturity factors. The following sections  
46 discuss these alternatives and the reasons NRC staff eliminated them from further  
47 consideration.

1 **2.3.1 Alternative Sites**  
2

3 This section discusses AES’s site-selection process and site selection criteria, and identifies the  
4 alternative sites for the proposed AES uranium enrichment facility (including the proposed  
5 EREF site in Bonneville County, Idaho). AES used a structured four-step approach to select a  
6 preferred site within the United States that met technical, environmental, safety, and business  
7 requirements (AES, 2010a):  
8

- 9 1. Identify potential regions and sites,  
10 2. Screen candidate sites (Phase I),  
11 3. Evaluate sites passing Phase I criteria (Phase II), and  
12 4. Identify a preferred site.  
13

14 The primary objectives of environmental acceptability, meeting technical requirements, and  
15 providing operational efficiencies were adhered to by AES throughout the screening process.  
16 Many environmental impacts can be avoided or significantly reduced through proper site  
17 selection.  
18

19 The NRC staff reviewed the AES site-selection process to determine if a site considered by AES  
20 was obviously superior to the proposed EREF site in Bonneville County, Idaho (NRC, 2002).  
21 The NRC staff determined that the process used by AES was rational and objective, and that  
22 the results were reasonable. None of the candidate sites was obviously superior to the AES  
23 preferred site in Bonneville County, Idaho.  
24

25 **2.3.1.1 Identification of Regions and Sites**  
26

27 Four criteria were used for the identification of suitable regions in which to site a proposed  
28 uranium enrichment facility:  
29

- 30 1. *Peak ground acceleration (PGA)*. Consideration of PGA is necessary due to centrifuge  
31 sensitivity to vibration; U.S. Geological Survey (USGS) general seismic hazard maps were  
32 reviewed to identify areas with a PGA less than 0.09g.  
33  
34 2. *Tornado frequency*. Construction of facilities designed to withstand tornado wind speeds  
35 greater than 257 kilometers per hour (160 miles per hour; probability of  $10^{-5}$  per year) was  
36 considered to be cost-prohibitive to meeting design standards and safety and operational  
37 requirements.  
38  
39 3. *Hurricane frequency*. Areas were identified where hurricanes with wind speeds no greater  
40 than 154 kilometers per hour (96 miles per hour) were likely to occur in order to meet design  
41 standards and safety and operational requirements.  
42  
43 4. *Severe winter weather*. Evaluated because of their potential impact on maintaining  
44 operations, weather and road closure data were reviewed in order to avoid areas with a high  
45 potential for road closures caused by severe winter weather.  
46

47 Areas of the United States that were clearly to be avoided because of seismic or weather  
48 concerns were excluded from further consideration. Those regions that were marginal were

1 retained. Figure 2-8 shows the regions of the United States that were found to meet the initial  
2 four criteria. Suitable sites were identified within the retained areas with assistance from local  
3 elected officials and economic development organizations.  
4

#### 5 **2.3.1.2 Screen Candidate Sites (Phase I)**

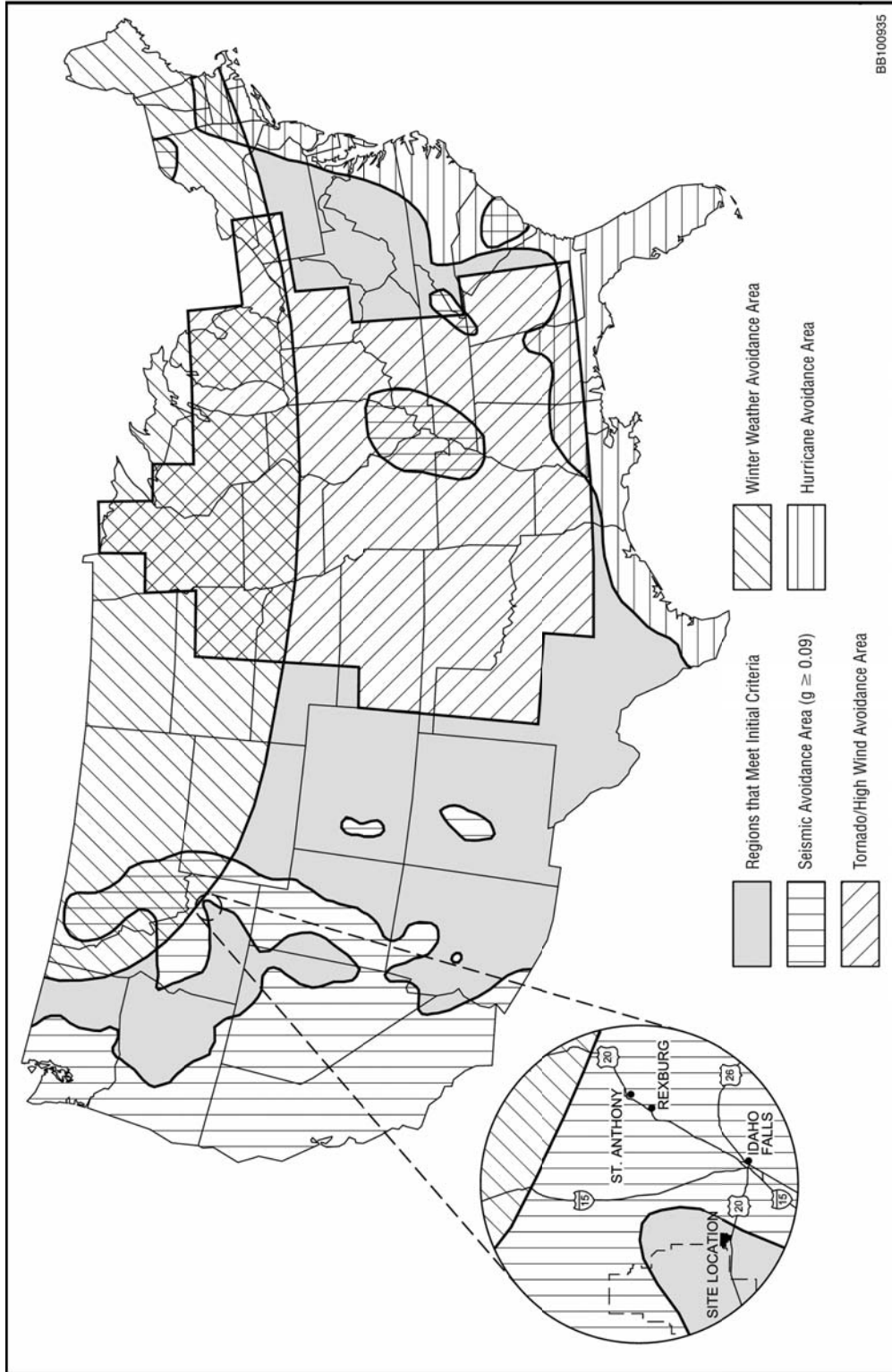
6  
7 Following application of the initial criteria, the 44 sites as identified in Table 2-3 were considered  
8 in the next site selection step. Phase I screening consisted of evaluation of the candidate sites  
9 against 11 criteria. Professional judgment was used by AES staff to assign a passing or failing  
10 grade to each criterion. Sites were not considered further if they failed any one criterion. The  
11 criteria used were: (1) Seismic History, (2) Geology, (3) Facility/Site (site size relative to facility  
12 footprint), (4) Redundant Electrical Power Supply, (5) Flooding Potential, (6) Prior Land  
13 Contamination, (7) Availability of Existing Site Data, (8) Threatened and Endangered Species  
14 near or on site, (9) Sensitive Properties (e.g., national parks), (10) Climate and Meteorology,  
15 and (11) Wetlands within the Facility Footprint on the site. Table 2-3 summarizes the results of  
16 the Phase I screening. Based on this screening, 10 of the 44 sites were recommended for  
17 further evaluation. Figure 2-9 shows the locations of these 10 sites.  
18

#### 19 **2.3.1.3 Site Evaluation (Phase II)**

20  
21 A decision analysis approach known as multi-attribute analysis was used to produce a  
22 consistent, repeatable, and documented evaluation of the 10 candidate sites identified by  
23 Phase I screening. Site rankings were assigned based on 38 criteria spanning the  
24 12 categories and the 3 site selection objectives shown in Figure 2-10. The weighting system  
25 used by AES, as shown in Table 2-4, was assigned to each objective, category, and criterion  
26 and was applied to a score of 1 to 10, which was given to each criterion for a particular site.  
27 Table 2-5 summarizes the features and drawbacks of each site. Figure 2-11 summarizes the  
28 total weighted scores for the candidate sites, with the Bonneville site having the highest score  
29 by a slim margin over the McNeil site.  
30

#### 31 **2.3.1.4 Preferred Site Identification**

32  
33 Forty-four sites in 7 States of 54 potential sites in 9 States were passed on from Step 1 to  
34 Step 2 (Phase I) of the selection process. The Phase I selection process identified 10 candidate  
35 sites (see Figure 2-9) for detailed evaluation in Phase II. The Phase II evaluation demonstrated  
36 that all 10 sites would be technically and environmentally suitable locations for AES's proposed  
37 uranium enrichment facility, with none obviously superior to the others. AES selected the  
38 Bonneville County, Idaho, site as the proposed site for an enrichment plant because this site  
39 has the greatest amount of acreage; readily available water supply; some of the lowest  
40 estimated costs for electric power, labor, and materials; and Bonneville County and the State of  
41 Idaho have shown strong support for the proposed enrichment plant. The second highest rated  
42 site, the McNeil, Idaho, site, has a size that is only one-quarter that of the Bonneville County site  
43 and has a much closer nearest resident that is about 2.0 kilometers (1.25 miles) away vs.  
44 7.6 kilometers (4.75 miles) for the Bonneville County site. With the larger size (which provides a  
45 greater distance to the site boundary from the proposed facility) and greater distance to the  
46 nearest resident, selection of the Bonneville County site would be expected to result in reduced  
47 air, visual, noise, human health, transportation, and potential accident impacts as compared to  
48 those at the McNeil, Idaho, site.



**Figure 2-8 United States Regions Meeting the Original Site Selection Criteria (modified from AES, 2010a)**

**Table 2-3 Candidate Sites for Phase I Screening**

<b>No.</b>	<b>County, State</b>	<b>Site</b>	<b>Result: Basis for Exclusion</b>
1	Bonneville, ID	Bonneville	Passed: Evaluated in Phase II
2	Bonneville, ID	McNeil	Passed: Evaluated in Phase II
3	Power, ID	Power County-1	Failed: Sensitive properties
4	Power, ID	Power County-2	Failed: Contamination
5	Bingham, ID	Blackfoot	Failed: Sensitive properties
6	Butte, ID	Atomic City	Failed: Ownership/transfer
7	Lea, NM	ELEA	Passed: Evaluated in Phase II
8	Lea, NM	Lea County-1	Failed: Data availability
9	Lea, NM	Lea County-2	Failed: Wetlands
10	Lea, NM	Lea County-3	Failed: Karst
11	Eddy, NM	Seven Rivers	Failed: Size, bisected by a public road
12	Eddy, NM	Berry Parcel	Failed: Liquefaction
13	Eddy, NM	Harroun	Failed: Liquefaction, karst, electric power, sensitive properties
14	Eddy, NM	Becker	Failed: Liquefaction, karst, contamination
15	Eddy, NM	WIPP-1	Failed: Ownership/transfer
16	Eddy, NM	WIPP-2	Passed: Evaluated in Phase II
17	Pike, OH	Portsmouth	Passed: Evaluated in Phase II
18	Pike, OH	Zahn's Corner-1	Failed: Size, contamination, wetlands
19	Pike, OH	Zahn's Corner-2	Failed: Wetlands, contamination
20	Aiken, SC	Savannah River Site (DOE)	Failed: Ownership/transfer, endangered species, wetlands
21	Cherokee, SC	Jobe Sand	Failed: Size
22	Laurens, SC	Copeland Stone	Failed: Sensitive properties, wetlands
23	Laurens, SC	Fleming Smith	Passed: Evaluated in Phase II
25	Greenwood, SC	Solutia	Failed: Size
26	Chester, SC	L&C Mega Site	Failed: Data availability, wetlands
27	Edgefield, SC	Gracewood	Failed: Wetlands
28	Andrews, TX	Grist	Passed: Evaluated in Phase II
29	Andrews, TX	Tom	Failed: Site characterization data
30	Andrews, TX	Parker	Failed: Site characterization data



**Table 2-3 Candidate Sites for Phase I Screening (Cont.)**

No.	County, State	Site	Result: Basis for Exclusion
31	Andrews, TX	Fisher	Failed: Site characterization data
32	Andrews, TX	WCS-1	Modified: To become part of WCS-2
33	Andrews, TX	WCS-2	Passed: Evaluated in Phase II
34	Martin, TX	Midland North	Failed: Site characterization data
35	Midland, TX	Midland South	Failed: Data availability
36	Amherst, VA	Amherst County-1	Failed: Floodplains, wetlands
37	Amherst, VA	Amherst County-2	Failed: Endangered species, sensitive properties
38	Appomattox, VA	Concord	Failed: Floodplains, wetlands
39	Carroll, VA	Wildwood	Passed: Evaluated in Phase II
40	Benton, WA	West Richland	Failed: Seismic, faults
41	Benton, WA	Horn Rapids (DOE)	Passed: Evaluated in Phase II
42	Benton, WA	Energy NW-1 (DOE)	Failed: Faults, contamination, ownership/transfer
43	Benton, WA	Energy NW-2 (DOE)	Failed: Contamination, ownership/transfer
44	Benton, WA	Highway 240 (DOE)	Failed: Seismic, ownership/transfer, sensitive properties

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**2.3.2 Alternative Sources of Low-Enriched Uranium**

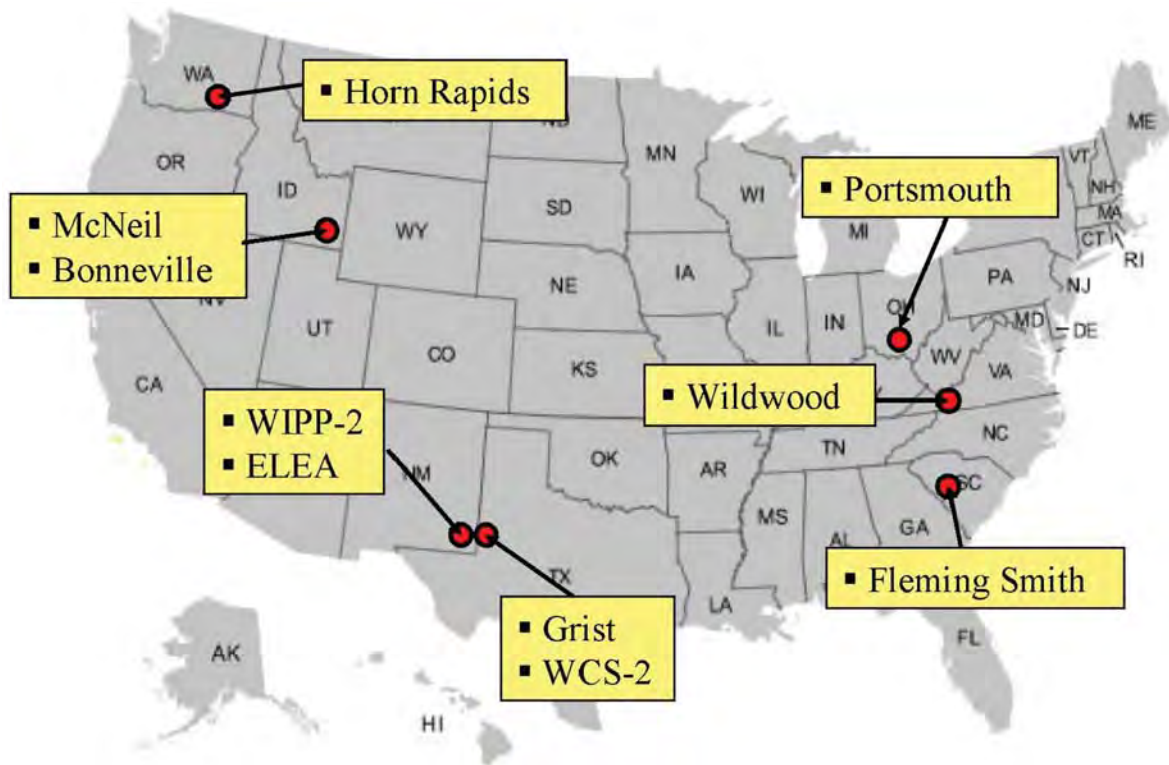
The NRC staff examined three alternatives to fulfill U.S. domestic enrichment needs. These alternatives were eliminated from further consideration for reasons summarized below.

**2.3.2.1 Re-Activate the Portsmouth Gaseous Diffusion Facility at Piketon**

In 2001, USEC closed the Portsmouth Gaseous Diffusion Plant (GDP) (in Piketon, Ohio) to reduce operating costs (DOE, 2003). USEC cited long-term financial benefits, more attractive power price arrangements, operational flexibility for power adjustments, and a history of reliable operations as reasons for choosing to continue operations at the Paducah GDP. In a June 2000 press release, USEC explained that it “clearly could not continue to operate two production facilities.” (USEC, 2000). Key business factors in USEC’s decision to reduce operations to a single production plant included long-term and short-term power costs, operational performance and reliability, design and material condition of the plants, risks associated with meeting customer orders on time, and other factors relating to assay levels, financial results, and new technology issues (USEC, 2000).

The NRC staff does not believe that there has been any significant change in the factors that were considered by USEC in its decision to cease uranium enrichment at the Portsmouth GDP. In addition, the gaseous diffusion technology is substantially more energy intensive than other enrichment technologies. The higher energy consumption results in larger indirect impacts, especially those impacts that are attributable to significantly higher electricity usage (e.g., air





1  
2 **Figure 2-9 Final 10 Candidate Gas Centrifuge Uranium Enrichment**  
3 **Facility Site Locations (AES, 2010a)**  
4

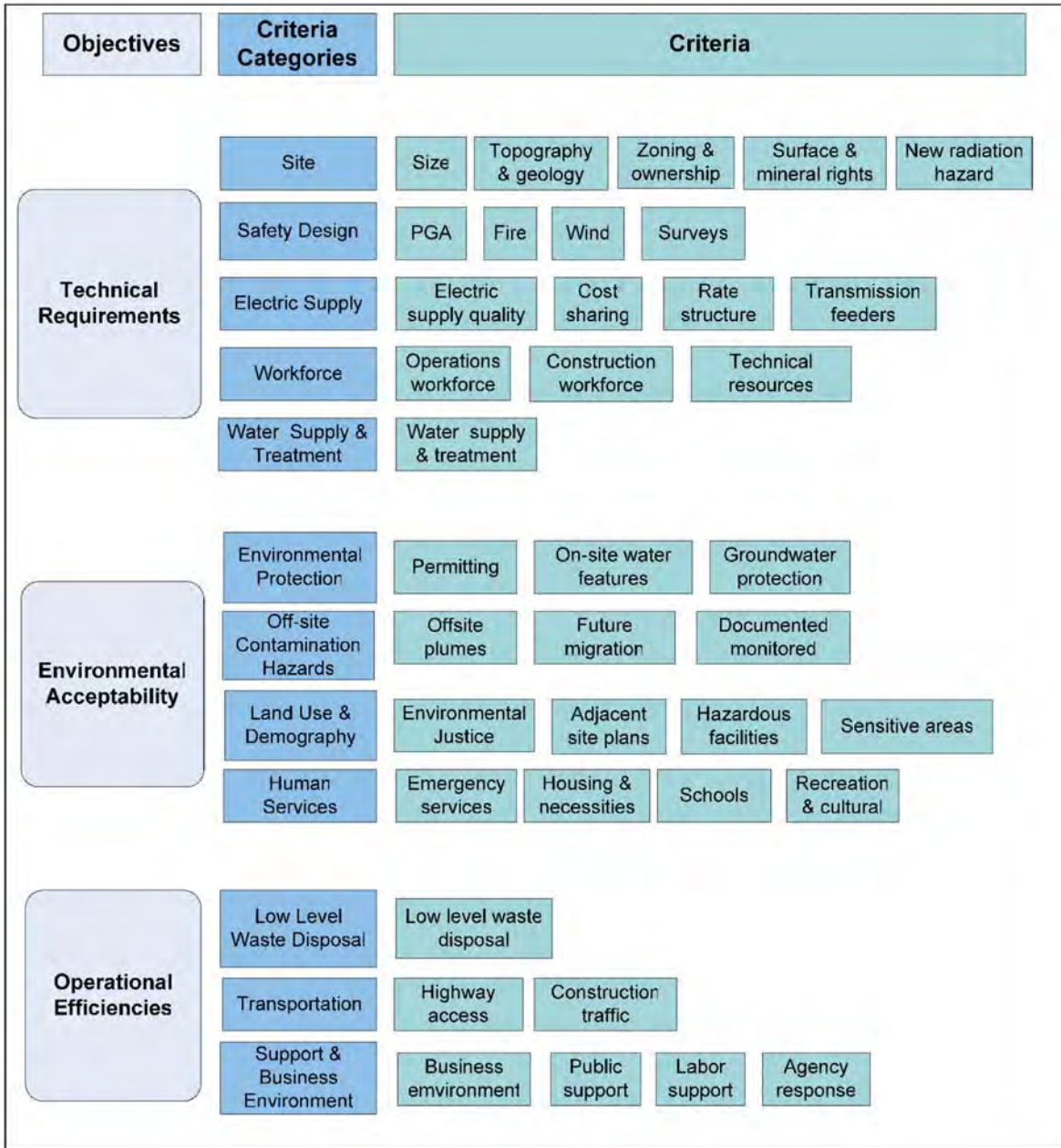
5 emissions from coal-fired electricity generation plants) (DOE, 1995). The age of the existing  
6 plant also calls into question its overall reliability. Furthermore, a contract has been awarded to  
7 decommission the plant (DOE, 2010b). Therefore, this proposed alternative was eliminated  
8 from further consideration.  
9

10 **2.3.2.2 Downblending Highly Enriched Uranium**  
11

12 Under this alternative, a domestic uranium enrichment plant would not be constructed to replace  
13 existing production. Instead, an equivalent amount of SWU would be obtained from  
14 downblending highly enriched uranium from either United States or Russian nuclear warheads.  
15 This alternative was eliminated because U.S. reliance on foreign sources of enrichment  
16 services, as an alternative to the proposed action, would not meet the national energy policy  
17 objective of a “viable, competitive, domestic uranium enrichment industry for the foreseeable  
18 future” (DOE, 2000). Also, it does not meet the need for a reliable source of enriched uranium,  
19 as discussed in Section 1.3. Furthermore, as discussed in Section 1.3.1, the Megatons to  
20 Megawatts Program downblending agreement is set to expire in 2013.  
21

22 **2.3.2.3 Purchase Low-Enriched Uranium from Foreign Sources**  
23

24 There are several potential sources of enrichment services worldwide. However, U.S. reliance  
25 on foreign sources of enrichment services, as an alternative to the proposed action, would not



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Figure 2-10 Organization of Gas Centrifuge Uranium Enrichment Facility Site Selection Objectives, Criteria Categories, and Criteria (AES, 2010a)

**Table 2-4 Objectives, Categories, and Criteria with Weights and Contribution to Site Score**

OBJECTIVE		CATEGORY		CRITERIA					
Objective	Weight	Contribution	Category	Weight	Contribution <sup>a</sup>	Criteria & Contribution	Weight	Contribution	
Technical Requirements	100	0.49	Site	100	0.17	Topography & Geology	100	0.05	
						Size	70	0.04	
						Surface & Mineral Rights	70	0.04	
						Zoning & Ownership	70	0.04	
						New Radiation Hazard	5	<0.01	
				Safety Design	70	0.12	Peak Ground Acceleration	100	0.06
						Fire Hazard	15	0.01	
						Wind Hazard	40	0.02	
						Existing Survey Data	60	0.03	
				Electrical System	60	0.10	Quality	100	0.03
						Rates	90	0.03	
						Cost	75	0.02	
					Feeders	70	0.02		
			Workforce	30	0.05	Construction Workforce	100	0.03	
					Operational Workforce	65	0.02		
					Technical Resources	35	0.01		
			Water Treatment & Supply	20	0.04	Water Treatment & Supply	100	0.04	

**Table 2-4 Objectives, Categories, and Criteria with Weights and Contribution to Site Score (Cont.)**

OBJECTIVE			CATEGORY			CRITERIA			
Objective	Weight	Contribution	Category	Weight	Contribution <sup>a</sup>	Criteria & Contribution	Weight	Contribution	
Environmental Acceptability	70	0.34	Environmental Protection	95	0.10	Permitting	100	0.04	
						Onsite Water Features	65	0.02	
							Groundwater	100	0.04
			Offsite Contamination Hazard	40	0.04	Current Offsite Plumes	100	0.02	
						Future Migration	30	0.01	
						Documented Monitoring	50	0.01	
			Land Use & Demography	100	0.11	Environmental Justice	100	0.04	
						Hazardous Facilities	95	0.03	
						Sensitive Areas	75	0.03	
						Adjacent Site Plans	40	0.02	
Operational Efficiencies	34	0.17	Human Services	80	0.09	Emergency Services	100	0.03	
						Housing & Necessities	90	0.03	
							Schools	65	0.02
							Recreational & Cultural Options	50	0.01
			Low-Level Waste (LLW) Disposal	15	0.02	LLW Disposal	100	0.02	
			Transportation	35	0.04	Highway Access	100	0.02	
							Construction Traffic	80	0.02
			Support & Business Environment	100	0.11	Business Environment	30	0.02	
						Public Support	100	0.05	
						Agencies	50	0.03	
					Labor Support	30	0.02		

<sup>a</sup> Values do not add to 1.00 in the contribution columns for category and criteria due to rounding.

**Table 2-5 Candidate Sites Considered in Phase II Evaluation**

<b>Site</b>	<b>Location</b>	<b>Selection Considerations</b>	<b>Potential Drawbacks</b>
Bonneville	Bonneville, ID	Remote location; near major highway; few nearby residences/activities; bounded by BLM and private land used for grazing/farming; topology and geology are favorable; simple land transfer; no surface or mineral rights issues; close to power; water from onsite wells; good workforce availability and housing; strong local and state support.	
McNeil	Bonneville, ID	Similar attributes as the Bonneville site.	Smaller than Bonneville (1000 acres [405 hectares] vs. >4000 acres [1619 hectares]); nearest resident closer than Bonneville (2.0 kilometers [1.25 miles] vs. 7.6 kilometers [4.75 miles]).
ELEA	Lea, NM	Remote location; near major highway; few nearby residences/activities; bounded by BLM and private land; favorable seismic characteristics; strong local support; privately owned/simple land transfer; most site-specific data of all 10 sites; Lea County water system capable of additional load.	Mineral leases under and adjacent to site; rights-of-way onsite (pipelines, transmission line, water line, and communication tower); workforce availability and housing not as good as other sites.
WIPP-2	Eddy, NM	Remote location; near major highway; few nearby residences/activities; bounded by BLM and private land; favorable seismic characteristics; strong local support; good regional data.	Complicated land transfer – portions owned by BLM and State of New Mexico; mineral leases under and adjacent to site; may require additional cultural resources permitting; Eddy County water system would require expansion; workforce availability and housing not as good as other sites.
Portsmouth	Piketon, OH	Adjacent to major interstate highway; DOE and USEC enrichment facilities adjacent to site; excellent utility infrastructure; good workforce availability; no surface or mineral rights.	Residents within 2 kilometers (1 mile) of the site; multiple private owners of site could affect land transfer; earthmoving required because of topography; fill may adversely affect seismic characteristics; floodplain onsite near boundary; irregular shape – small effective area compared to most other sites; site divided by road and rail line; closed landfill adjacent to site with trichloroethylene contamination.

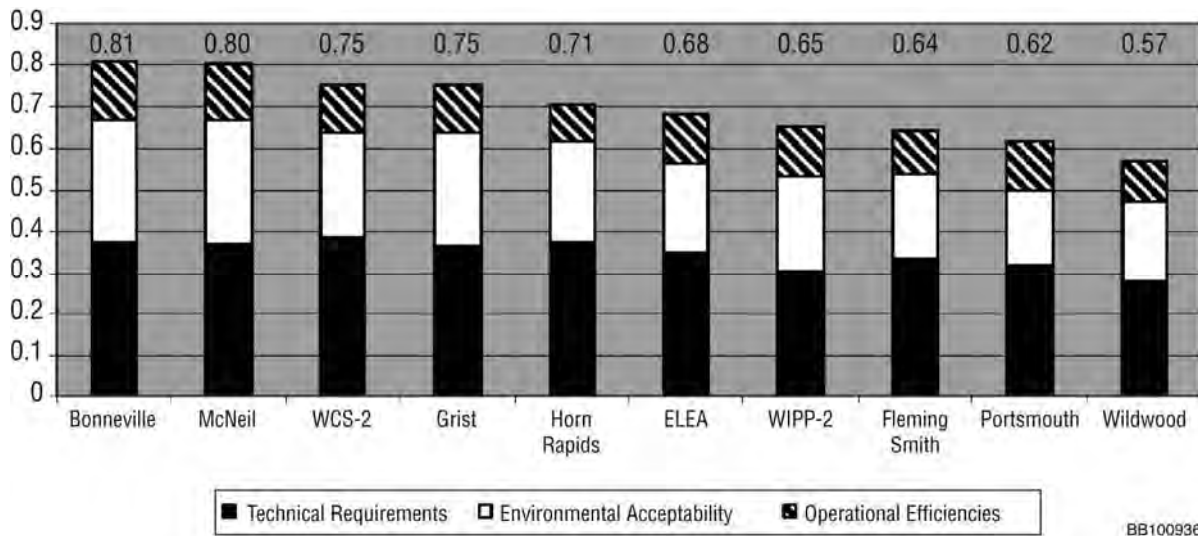


**Table 2-5 Candidate Sites Considered in Phase II Evaluation (Cont.)**

<b>Site</b>	<b>Location</b>	<b>Selection Considerations</b>	<b>Potential Drawbacks</b>
Fleming Smith	Laurens, SC	Near major interstate highway; next to existing and proposed industrial developments; available electric supply and other utilities; large workforce; sufficient water capacity from existing system; strong local and state support.	Residents within 0.4 kilometer (0.25 mile) of the site; extensive earthmoving required because of topography; extensive fill may impact seismic stability; several ROWs onsite including sewer and a pressurized pipeline; wetland permit may be required.
Grist	Andrews, TX	Remote location; near major highway; few nearby residences; favorable seismic characteristics, topography, and geology; simple land transfer; surrounded by private landowners; strong local and state support; no special permitting issues.	New water lines from Gaines County would be needed; one of smallest sites at 900 acres (364 hectares); mineral rights onsite would have to be purchased; low workforce availability and housing score.
WCS-2	Andrews, TX	Similar attributes as the Grist site; second largest site at 2560 acres (1036 hectares).	New water lines from Gaines County would be needed; within 3 kilometers (2 miles) of the WCS low-level and hazardous waste facility; pipeline ROWs are present; mineral rights onsite would have to be purchased; low workforce availability and housing score.
Wildwood	Carroll, VA	Adjacent to major interstate highway and a commercial development; privately owned – simple land transfer; no surface or mineral rights.	Residents within 3 kilometers (2 miles) of the site; extensive earthmoving required because of topography; extensive fill may impact seismic stability; drainage that bisects site may have associated wetlands; irregular shape – smallest effective area of all sites; small regional airport less than 3 kilometers (2 miles) away with flight patterns over the site; water available but system capacity would require expansion; has least amount of site-specific data available.
Horn Rapids	Benton, WA	On south edge of the DOE Hanford Reservation; no surface or mineral rights; excellent utility infrastructure and workforce availability; no nearby sensitive resources or areas; AES fuel fabrication facility adjacent to the site.	Land transfer may be complicated because of DOE requirements; small regional airport about 3 kilometers (2 miles) away with flight patterns over the site; lacks strong support at the State and national levels.

Source: AES, 2010a.





1

2 **Figure 2-11 Candidate Sites Phase II Evaluation Results (modified from AES, 2010a)**

3

4 meet the national energy policy objective of a “viable, competitive, domestic uranium enrichment  
 5 industry for the foreseeable future” (DOE, 2000). For this reason, the NRC staff does not  
 6 consider this alternative to meet the need for the proposed action, and therefore has eliminated  
 7 it from further study.

8

9 **2.3.3 Alternative Technologies for Enrichment**

10

11 A number of different processes have been invented for enriching uranium; only three (gaseous  
 12 diffusion, gas centrifuge, and laser excitation) are candidates for commercial use, and of those  
 13 only the gaseous diffusion and gas centrifuge technologies have been deployed for large-scale  
 14 industrial use. Other technologies – namely, electromagnetic isotope separation, liquid thermal  
 15 diffusion, and early-generation laser enrichment – have proven too costly to operate or remain  
 16 at the research and laboratory developmental scale, or in the case of laser-enrichment have  
 17 been superseded by a more advanced technology. All of these technologies are discussed  
 18 below.

19

20 **2.3.3.1 Electromagnetic Isotope Separation Process**

21

22 Figure 2-12 shows a sketch of the electromagnetic isotope separation process. In this process,  
 23 a monoenergetic beam of ions of normal uranium travels between the poles of a magnet. The  
 24 magnetic field causes the beam to split into several streams according to the mass of the  
 25 isotope. Each isotope has a different radius of curvature and follows a slightly different path.  
 26 Collection cups at the ends of the semicircular trajectories catch the homogenous streams.  
 27 Because the energy requirements for this process proved very high – in excess of 3000 kilowatt  
 28 hours per SWU – and production was very slow (Heilbron et al., 1981), electromagnetic isotope  
 29 separation was not considered viable and was removed from further consideration.

30

1 **2.3.3.2 Liquid Thermal Diffusion**

2  
3 Figure 2-13 is a diagram of the liquid thermal  
4 diffusion process, which was investigated in the  
5 1940s. It is based on the concept that a temperature  
6 gradient across a thin layer of liquid or gas causes  
7 thermal diffusion that separates isotopes of differing  
8 masses. When a thin, vertical column is cooled on  
9 one side and heated on the other, thermal  
10 convection currents are generated and the material  
11 flows upward along the heated side and downward  
12 along the cooled side. Under these conditions, the  
13 lighter  $UF_6$  molecules diffuse toward the warmer  
14 surface and heavier  $UF_6$  molecules concentrate  
15 near the cooler side. The combination of this thermal  
16 diffusion and the thermal convection currents causes  
17 the lighter uranium-235 molecules to concentrate  
18 on top of the thin column while the heavier uranium-235  
19 goes to the bottom. Taller columns produce better  
20 separation. Eventually, a facility using this process  
21 was designed and constructed at Oak Ridge,  
22 Tennessee, but it was closed after about a year of  
23 operation because of cost and maintenance  
24 concerns (Settle, 2004). Based on high operating  
25 costs and high maintenance requirements, the liquid  
26 thermal diffusion process has been eliminated from  
27 further consideration.

28  
29 **2.3.3.3 Gaseous Diffusion Process**

30  
31 The gaseous diffusion process is based on molecular  
32 effusion, a process that occurs whenever a gas is  
33 separated from a vacuum by a porous barrier. The  
34 gas flows from the high-pressure side to the low-  
35 pressure side. The rate of effusion of a gas through  
36 a porous barrier is inversely proportional to the  
37 square root of its mass. Thus, lighter molecules pass  
38 through the barrier faster than heavier ones.

39 Figure 2-14 is a diagram of a single gas diffusion  
40 stage. The gaseous diffusion process consists of thousands of individual stages connected in  
41 series to multiply the separation factor.

42  
43 Gaseous diffusion is the only enrichment technology in commercial use in the United States, but  
44 it has relatively large resource requirements. The Paducah GDP contains 1760 enrichment  
45 stages and is designed to produce  $UF_6$  enriched up to 5.5 percent uranium-235. The design  
46 capacity of the Paducah GDP is approximately 8 million SWUs per year, but it has never  
47 operated at greater than 5.5 million SWUs. Paducah consumes approximately 2200 kilowatt  
48 hours per kilogram of SWU (DOE, 2000). DOE anticipates “the inevitable cessation of all  
49 domestic gaseous diffusion enrichment operations” due to the higher cost of aging diffusion

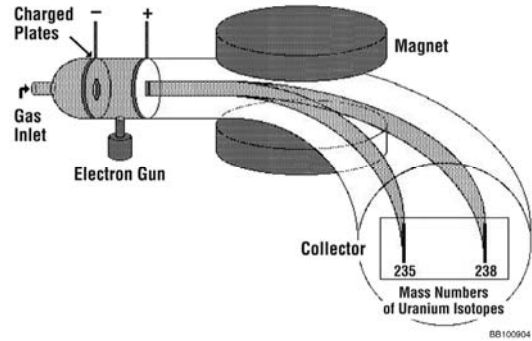


Figure 2-12 Electromagnetic Isotopic Separation Process (Milani, 2005)

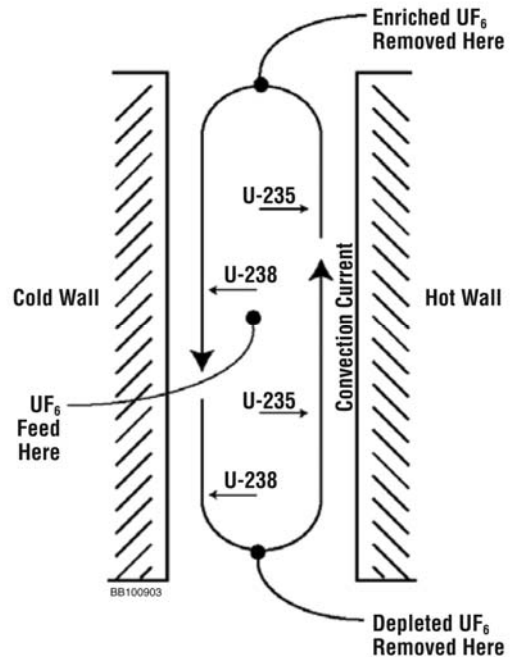


Figure 2-13 Liquid Thermal Diffusion Process (NRC, 2005b)

1 facilities (DOE, 2001). Therefore, the gas diffusion  
2 process has been eliminated from further  
3 consideration.

#### 4 **2.3.3.4 Atomic Vapor Laser Isotope Separation**

7 The Atomic Vapor Laser Isotope Separation  
8 (AVLIS) process, shown in Figure 2-15, is based on  
9 the circumstance that different isotopes of the same  
10 element, though chemically identical, have different  
11 electronic energies and absorb different  
12 wavelengths of laser light. The isotopes of most  
13 elements can be separated by a laser-based  
14 process if they can be efficiently vaporized into  
15 individual atoms or molecules. In AVLIS, uranium  
16 metal is vaporized, and the vapor stream is illuminated  
17 with a laser light of a specific wavelength that is  
18 absorbed only by uranium-235. The laser selectively  
19 adds enough energy to ionize or remove an electron  
20 from uranium-235 atoms, while leaving the other  
21 isotopes unaffected. The ionized uranium-235 atoms  
22 are then collected on negatively charged surfaces  
23 inside the separator unit. The collected material  
24 (enriched product) is condensed as a liquid on the  
25 charged surfaces and then drains to a caster where it  
26 solidifies as metal nuggets.

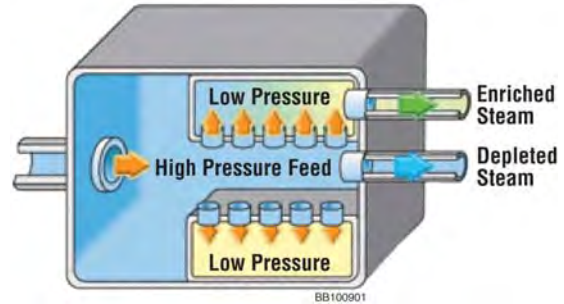


Figure 2-14 Gaseous Diffusion Stage (NRC, 2009a)

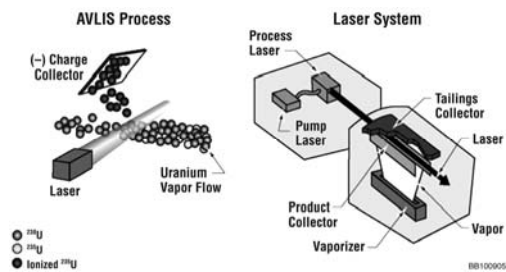


Figure 2-15 Atomic Vapor Laser Isotope Separation Process (Hargrove, 2000)

27  
28 The high separation factor in AVLIS means fewer stages to achieve a given enrichment, lower  
29 energy consumption, and smaller waste volume. However, budget constraints compelled USEC  
30 to discontinue development of the U.S. AVLIS program in 1999 (USEC, 1999). Because  
31 development of the AVLIS process was not continued, and the technology has been  
32 superseded by a more advanced laser-based technology discussed in Section 2.3.3.6, AVLIS  
33 has been eliminated from further consideration.

#### 34 **2.3.3.5 Molecular Laser Isotope Separation**

36  
37 Like AVLIS, the Molecular Laser Isotope Separation (MLIS) process uses a tuned laser to excite  
38 uranium-235 molecules in the  $UF_6$  feed gas. A second laser then dissociates excited molecules  
39 into  $UF_5$  and free fluorine atoms. The enriched  $UF_5$  then precipitates and is filtered as a powder  
40 from the feed gas. Each stage of enrichment requires conversion of enriched  $UF_5$  back to  $UF_6$ .  
41 The advantages of MLIS include low power consumption and the use of  $UF_6$  as a process gas.  
42 However, it is less efficient and up to four times more energy intensive than AVLIS. Therefore,  
43 all countries except Japan have discontinued development of MLIS. Because development of  
44 the MLIS process was not continued and the technology has been superseded by the more  
45 advanced laser-based technology discussed in Section 2.3.3.6, MLIS has been eliminated from  
46 further consideration.

1 **2.3.3.6 Separation of Isotopes by Laser Excitation**  
2

3 The separation of isotopes by laser excitation (SILEX) process is a third-generation laser-based  
4 technology for enriching natural uranium. The SILEX technology, developed by Silex Systems  
5 Ltd., in partnership with GE-Hitachi Global Laser Enrichment, LLC (GLE) (and formerly, USEC),  
6 is similar to the two earlier laser-excitation technologies, MLIS and AVLIS, discussed in above in  
7 Sections 2.3.3.4 and 2.3.3.5, respectively (USEC, 2003; GLE, 2008). All three laser-based  
8 processes isolate uranium-235 by optical rather than mechanical means. The SILEX laser-  
9 based technology has several advantages over the conventional technologies of gas diffusion  
10 and gas centrifuge, including lower capital costs, lower operating costs, simpler and more  
11 versatile deployment, more flexibility in product enrichment, smaller facility footprint for  
12 comparable enrichment capacity, and reduced environmental impacts.  
13

14 In laser excitation enrichment, UF<sub>6</sub> vapor is illuminated with a tuned laser of a specific  
15 wavelength that is absorbed only by uranium-235 atoms while leaving other isotopes  
16 unaffected. The stream then passes through an electromagnetic field to separate the ionized  
17 uranium-235 atoms from other uranium isotopes.  
18

19 The SILEX technology is the world's only third-generation laser-based enrichment technology.  
20 (GLE, 2008). In a 2006 agreement with Silex Systems, General Electric (GE) acquired "the  
21 exclusive rights to complete the process development and commercial deployment of Silex's  
22 enrichment technology" (GE, 2006). GLE has submitted an application to the NRC for a  
23 proposed facility in Wilmington, North Carolina, that would be the first enrichment facility to  
24 employ the SILEX technology. This application is currently under NRC review (NRC, 2009b),  
25 and a Draft EIS was published for public comment (NRC, 2010c).  
26

27 It is possible at some point in the future that after successfully obtaining a license and  
28 designing, constructing, and deploying its first SILEX-based enrichment facility, GLE could  
29 decide to license the technology to other companies. However, such a possibility is merely  
30 speculative at this time because the first full-scale commercial facility has yet to be licensed,  
31 constructed, or operated. At present, only GLE has the rights to the SILEX technology, and  
32 thus only GLE has the ability to design and build a facility using the technology. Therefore,  
33 because this alternative is not available for use by AES for the proposed EREF, it has been  
34 eliminated from further consideration.  
35

36 **2.4 Summary and Comparison of Predicted Environmental Impacts**  
37

38 Chapter 4 of this EIS presents a detailed evaluation of the environmental impacts of the  
39 proposed action and the no-action alternative. Table 2-6 summarizes and compares these  
40 environmental impacts. A common element between the two alternatives is the occurrence of  
41 preconstruction activities. It is assumed that preconstruction activities take place under both  
42 alternatives and, therefore, the impacts associated with preconstruction activities take place  
43 regardless of which alternative is selected. As a result, the comparison of alternatives  
44 presented in Table 2-6 is intended primarily to highlight the differences between the two  
45 alternatives after preconstruction activities have occurred.  
46

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative**

Affected Environment	Proposed Action	No-Action Alternative
Land Use	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>SMALL. The property to be purchased by AES for the proposed project is privately owned, contains mostly sagebrush rangeland and agricultural areas, and is bordered by similar land covers. The proposed property is zoned by Bonneville County G-1 Grazing, and a uranium enrichment facility is consistent with current zoning. Restrictions to land use would begin with the purchase of the property by AES. All grazing and agriculture would cease on the proposed property prior to construction. Similar land uses on surrounding properties would continue. Impacts on land use due to construction would be SMALL.</p> <p>Operation of the proposed EREF would restrict land use on the proposed property to the production of enriched uranium. The operation of the proposed EREF is not expected to alter land use on adjacent properties. Impacts on land use due to operations would be SMALL.</p> <p>At the end of decommissioning, the buildings and structures would be available for unrestricted use. As a result, impacts on land use due to decommissioning would be SMALL.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p> <p>SMALL. AES would purchase the proposed property and restrictions on grazing and agriculture would initially occur. However, the zoning designation for the proposed property would remain G-1 Grazing whether the proposed EREF is built or not, and the land uses of grazing and farming could potentially resume.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, land use impacts could occur and could range from SMALL to LARGE, depending on factors such as the existing land uses at the alternate location and the nature of the facility.</p>



**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Historic and Cultural Resources	<p><b>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</b></p> <p>SMALL to MODERATE. Construction would take place on ground previously disturbed by preconstruction activities, and impacts on historic or archaeological resources would primarily occur prior to construction. There are 13 cultural resource sites (3 prehistoric, 6 historic, and 4 multi-component) in the surveyed areas of the proposed EREF property. One of these sites, the John Leopard Homestead (MW004), is located within the footprint of the proposed EREF and has been recommended as eligible for the <i>National Register of Historic Places</i>. The removal of site MW004, which has already occurred, resulted in a LARGE impact because the site no longer exists; however, because AES removed the site through professional excavation and data recovery and there are other homestead sites of this type found in the region, the impact has been mitigated to a MODERATE level.</p> <p>The Wasden Complex is an important group of archaeological sites, located approximately 1.6 kilometers (1 mile) from the proposed EREF site. Construction and operation of most of the proposed facility would not be visible from the Wasden Complex because a ridgeline would obscure views of the lower portions of the proposed facility. Other impacts during operations would be SMALL because no intact historic or cultural resources would</p>	<p><b>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</b></p> <p>SMALL to MODERATE. The proposed EREF would not be constructed. Site MW004 would not be affected by NRC's licensing action, and Section 106 of the <i>National Historic Preservation Act</i> would not apply because no Federal action would be involved. However, the removal of site MW004, which has already occurred, resulted in a LARGE impact because the site no longer exists; but because AES removed this site through professional excavation and data recovery and there are other homestead sites of this type found in the region, the impact has been mitigated to a MODERATE level. No visual effects would occur to the viewshed for the Wasden Complex.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, historical and cultural resource impacts could occur and could range from SMALL to LARGE. Consideration of historical and cultural resources at the alternate location would be reviewed in consultation with the appropriate SHPO.</p>



**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Historic and Cultural Resources (Cont.)	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>remain and nearby resources would not be impacted by noise.</p> <p>Decommissioning would not likely affect historic and cultural resources because any areas disturbed during decommissioning would have been previously disturbed during construction. Impacts would be SMALL.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p>
Visual and Scenic Resources	<p>SMALL to MODERATE. The visual environment of the proposed EREF property and of surrounding areas is predominantly rangeland and cropland. Activities such as clearing and grading of the proposed site would change the visual setting, but would not drastically alter the appearance of the area. The same is true for fugitive dust generation during construction (which would be of temporary duration) and construction traffic on the proposed property. However, because of the extent of the proposed EREF project, the type and size of equipment involved in construction, and the industrial character of buildings to be used, construction of the proposed EREF would create significant contrast with the surrounding visual environment. The proposed facility would be located approximately 2.4 kilometers (1.5 miles) from areas of public view, including US 20 and the Hell's Half Acre Wilderness Study Area (WSA). The U.S. Bureau of Land Management (BLM) gave a Visual Resource Management (VRM) Class I designation to the WSA,</p>	<p>SMALL. Since the proposed EREF would not be constructed, no major visual intrusions to the existing landscape would occur. The current land cover would be altered by preconstruction activities, but no large industrial structures would be constructed. The existing natural character of the area would largely remain intact. The lack of development would be consistent with BLM's VRM Class I designation for the Hell's Half Acre WSA, and no intrusions to the Wasden Complex viewshed would occur.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, visual and scenic resource impacts could occur and could range from SMALL to LARGE. These impacts would depend on factors such as the visual setting in which the facility is to be constructed and operated and the nature of the facility.</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Visual and Scenic Resources (Cont.)	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>which applies to areas of high scenic quality. Construction of the proposed EREF would introduce visual intrusions that are out of character with the surrounding area. While certain construction activities would have a SMALL impact (e.g., fugitive dust generation), the significant contrast posed by the buildings under construction would have a MODERATE impact.</p> <p>Construction and operation of most of the proposed facilities would not be visible from the Wasden Complex because a ridge line obscures views of the proposed facility.</p> <p>Operations would have an impact on the surrounding visual landscape. The proposed facility is visually inconsistent with the current setting, and its operation is expected to alter visual ratings on surrounding public lands, which constitutes a MODERATE visual impact.</p> <p>At the end of decommissioning, the buildings and structures would be available for unrestricted use. As a result, impacts on visual and scenic resources would remain MODERATE.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Air Quality	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>SMALL. Air emissions during construction would include fugitive dust from heavy equipment working on the proposed site and engine emissions from construction equipment onsite and vehicles transporting workers and materials to the proposed site. Toward the latter portion of the construction period, the auxiliary diesel electric generators would also contribute to air emissions. Air quality impacts during construction would be SMALL for all hazardous air pollutants (HAPs) and all criteria pollutants.</p> <p>During operations, the proposed EREF would not be a major source of air emissions, although there is a potential for small gaseous releases associated with operation of the process that could contain uranium isotopes, hydrogen fluoride (HF), and uranyl fluoride (UO<sub>2</sub>F<sub>2</sub>).</p> <p>Also, small amounts of nonradioactive air emissions consisting of carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM), volatile organic compounds (VOCs), and sulfur dioxide (SO<sub>2</sub>) would be released:</p> <ul style="list-style-type: none"> <li>from auxiliary diesel electric generators to supply electrical power when power from the utility grid is not available.</li> </ul>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p> <p>SMALL. The air quality impacts associated with construction and operation of the proposed EREF would not occur. The proposed site could revert to agricultural activities, which would impact ambient air quality through the release of criteria pollutants from the operation of agricultural vehicles and equipment and the release of fugitive dusts from the tilling of soils.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, air quality impacts could occur and could range from SMALL to LARGE. The nature and scale of air impacts resulting from the operation of similar enrichment technologies at alternative locations could be similar to those predicted for the proposed action, but the impacts on the local environments of such alternative facilities would be dependent on extant local conditions and cannot be predicted at this time.</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p>
Air Quality (Cont.)	<ul style="list-style-type: none"> <li>• during building and equipment maintenance activities, and</li> <li>• from trucks, automobiles, and other vehicles in use onsite.</li> </ul> <p>Air emissions are not expected to impact regional visibility. Ambient air modeling predicts that impacts on ambient air quality from routine operation of the proposed EREF would be SMALL with respect to all criteria pollutants and all HAPs.</p> <p>During decommissioning, emissions could include fugitive dust and CO, NO<sub>x</sub>, PM, VOCs, and SO<sub>2</sub> from transportation equipment, and the impacts of these emissions would be SMALL.</p>	
Geology and Soil	<p>SMALL. Construction activities could cause short-term impacts such as an increase in soil erosion at the proposed site. Soil erosion could result from wind action and rain, although rainfall in the vicinity of the proposed site is low. Compaction of soils due to heavy vehicle traffic would increase the potential for soil erosion via runoff. Impacts would be SMALL.</p> <p>Impacts on soils during operations at the proposed facility would also be SMALL because activities would not increase the potential for soil erosion beyond that for the</p>	<p>SMALL. No additional land disturbance from construction would occur, and the proposed site could revert to crop and grazing activities. Wind and water erosion would continue to be the most significant natural processes affecting the geology and soils at the proposed site.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, geology and soil impacts could occur and could range from SMALL to LARGE. These impacts could be</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Geology and Soil (Cont.)	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>surrounding area. The impacts to soil quality from atmospheric deposition of pollutants during operations would be SMALL.</p> <p>Land disturbance associated with decommissioning could temporarily increase the potential for soil erosion at the proposed EREF site, resulting in impacts similar to (but less than) those during construction. As a result, impacts to soils due to decontamination and decommissioning activities would be SMALL.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p> <p>similar to those of the proposed action, but would depend on factors such as the design of the facility, construction and operations methods used, and local geology and soil conditions.</p>
Water Resources	<p>SMALL. Annual maximum groundwater usage rates during construction comprise about 16 percent of the annual water right appropriation that has been transferred to the proposed property for use as industrial water. No surface water sources would be used. As a result, only SMALL impacts to water resources during construction would occur. No wastewater would be generated or discharged during the construction period. Because natural surface water bodies are absent within and near the proposed EREF site and groundwater occurs at depths of 202 meters (661 feet) to 220 meters (722 feet), water quality impacts during the construction period would be SMALL.</p>	<p>SMALL. Additional water use may or may not occur, depending on future plans for the property. Water resources would be unchanged. Water usage could continue at the current rate should agricultural activities resume at the proposed site, and impacts on the ESRP aquifer and downgradient water users would be SMALL. No changes to surface water quality would be expected, and natural (intermittent) surface flow of stormwater on the proposed site would continue; therefore, the impact on surface water is expected to be SMALL. Because no additional groundwater use or adverse changes to groundwater quality</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Water Resources (Cont.)	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>Water usage rates during operations are well within the water right appropriation. Both average and peak annual water use requirements would be less than 1 percent of the total groundwater usage from the Eastern Snake River Plain (ESRP) aquifer in Bonneville County. No process effluents would discharge to the retention or detention basins or into surface water. Therefore, liquid effluents would have a SMALL impact on water resources. Because all of the water discharged to the Cylinder Storage Pads Stormwater Retention Basins would evaporate, the basins would have a SMALL impact on the quality of water resources. The site Stormwater Detention Basin seepage would also have a SMALL impact on water resources of the area because no wastewater would be discharged to the basin.</p> <p>Since the usage and discharge impacts to water resources during the decommissioning phase would be similar to those during construction, the impacts to water resources would remain SMALL.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p> <p>would be expected, the impact on groundwater resources would be SMALL.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, surface water or groundwater impacts could occur and could range from SMALL to LARGE. These impacts would depend on factors such as the water usage and discharge characteristics of the facility and the nature and extent of groundwater and surface water conditions at the alternate location.</p>



**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p>
Ecological Resources	<p>SMALL. Construction activities that could impact ecological resources include constructing the proposed EREF buildings and uranium hexafluoride (UF<sub>6</sub>) cylinder storage pads. Most construction activities would occur in areas that would have already been disturbed by preconstruction activities. Impacts on vegetation would occur primarily from any additional vegetation clearing. Indirect impacts would include the generation of fugitive dust, spread of invasive species, changes in drainage patterns, soil compaction, erosion of disturbed areas, potential sedimentation of downgradient habitats, and accidental releases of hazardous or toxic materials (e.g., fuel spills). These activities would also result in some wildlife mortality and would cause other wildlife to relocate as a result of noise, lighting, traffic, and human presence. Collisions with construction equipment and other vehicles may cause some wildlife mortality. No rare or unique plant communities, or threatened or endangered species, have been found or are known to occur on the proposed site, although habitat on the proposed property is known to be used by greater sage-grouse (a Federal candidate species). No population-level impacts would be expected on any Federally listed or State-listed species from construction activities. Impacts of construction of the proposed facility would be SMALL.</p>	<p>SMALL. Most impacts on ecological resources would occur during the preconstruction phase. However, such impacts would also occur under the proposed action. The potential impacts associated with the construction, operation, and decommissioning of the proposed EREF would not occur. The land on the proposed EREF site could revert to crop and grazing activities. Because denying the license would not result in additional land disturbance on the proposed EREF property, anticipated impacts on ecological resources from the no-action alternative would be SMALL.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, ecological impacts could occur and could range from SMALL to LARGE. The nature and scale of impacts at the alternate location would depend on factors such as the ecological resources present and type of facility.</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Ecological Resources (Cont.)	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>Operation of the proposed EREF could result in impacts on wildlife and plant communities as a result of noise, lighting, traffic, human presence, air emissions, and retention/detention ponds. However, these impacts would be SMALL. No impacts from operations would be expected on any Federally listed or State-listed species. Impacts on greater sage-grouse would be SMALL</p> <p>Vegetation and wildlife that became established near the proposed facility could be affected by decommissioning activities. Impacts during decommissioning would be similar to those during construction and would be SMALL.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p>
Noise	<p>SMALL. The nearest resident is located approximately 7.7 kilometers (4.8 miles) east of the proposed site. No residence is expected to experience unacceptable noise levels during construction. Noise impacts from construction may exceed established standards at some offsite locations for relatively short periods of time. However, because of the distances involved, expected levels of attenuation, and AES's commitment to appropriate mitigations, the impacts would be SMALL for human receptors. During the overlap period when partial operations begin while building construction continues, noise impacts from construction and operation are expected to be additive, but still substantially reduced from noise levels during initial construction.</p>	<p>SMALL. None of the noise impacts associated with construction, operation, or decommissioning of the proposed EREF would occur. Land uses on the proposed EREF site could revert to previous applications, livestock grazing and/or crop production, with concomitant SMALL noise impacts.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, noise impacts could occur and could range from SMALL to LARGE. These impacts could be similar to those of the proposed action. However, impacts would be dependent on circumstantial factors such as</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Noise (Cont.)	<b><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></b>	<b><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></b>
	Major noise sources associated with operation of the proposed facility include the six diesel-fueled emergency generators, commuter traffic, the movement of delivery vehicles, and operation of various pumps, compressors, and cooling fans. Operational noise estimates at the proposed property boundary satisfy all relevant or potentially relevant U.S. noise standards and guidance. Residents in the vicinity of US 20, who are otherwise unaffected by noise from the proposed EREF industrial footprint, would be impacted by slightly increased traffic noise. Noise impacts from operation of the proposed EREF would be SMALL.	local meteorologic conditions, the number and location of the nearest members of the public, and the types and extent of activities necessary to prepare the site for construction at the alternate location.
Transportation	Noise sources and levels during decommissioning would be similar to those during construction, and peaking noise levels would be expected to occur for short durations. As a result, noise impacts from decommissioning would be SMALL.	SMALL. Traffic volumes and patterns would remain unchanged from existing conditions. The current volume of radioactive material and chemical shipments to/from facilities other than the proposed EREF would not increase.
	SMALL to MODERATE. The primary impact of the proposed action would be increased traffic on nearby roads. Impacts during construction would occur from transportation of personnel, construction materials, and nonradiological waste. All traffic to and from the proposed EREF during construction and operations would use US 20. Construction activities at the proposed EREF site could result in a 55 percent increase in traffic volume on	Should another domestic enrichment facility be constructed at an alternate location, transportation

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Transportation (Cont.)	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>US 20 (including the period when construction and operations overlap). Because traffic volume is expected to remain below the design capacity of Interstate 15 (I-15) and traffic slowdowns or delays would only be expected to occur at the entrance to the proposed EREF during access road construction and shift changes, the impacts on overall traffic patterns and volumes during construction would be SMALL to MODERATE on US 20 and SMALL on I-15. The impacts from the truck traffic to and from the proposed site during construction would be SMALL.</p> <p>Operations impacts would occur from the transport of personnel and nonradiological and radioactive materials to and from the proposed EREF, especially during the period when construction and operation overlap. Increased traffic during operation of the proposed facility would have a SMALL to MODERATE impact on the current traffic on US 20 (SMALL for any off-peak shift change). The impacts of truck traffic to and from the proposed site during operation would be SMALL. Annual transportation accident impacts (radiological and chemical) would be SMALL.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p> <p>impacts could occur and could range from SMALL to LARGE. These impacts could be similar to those of the proposed action, depending on factors such as the existing road network and traffic patterns.</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
	<p><i><b>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</b></i></p>	<p><i><b>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</b></i></p>
<p>Transportation (Cont.)</p>	<p>Traffic during the initial portion of decommissioning would be approximately the same as for the period when construction and operations overlap. Traffic after the cessation of operations would be less than during either construction or operation. Impacts on local traffic on US 20 would be <b>SMALL to MODERATE</b>.</p>	
<p>Public and Occupational Health</p>	<p><b>SMALL.</b> During construction, nonradiological impacts include injuries and illnesses incurred by workers as well as impacts due to exposure to chemicals or other nonradiological substances. All such potential impacts would be <b>SMALL</b>. No radiological impacts are expected during construction.</p> <p>Nonradiological impacts during operation include worker illnesses and injuries and impacts from worker or public exposure to hazardous chemicals used or present during operations, mainly uranium and HF. Due to low estimated concentrations of uranium and HF at public (proposed property boundary) and workplace receptor locations, nonradiological impacts due to exposures to hazardous chemicals (including uranium and HF) during operations would be <b>SMALL</b>.</p>	<p><b>SMALL.</b> Health impacts from construction, operation, and decommissioning would not occur. Associated worker and public impacts from chemical and radioactive hazards would also not occur. Should the land be returned to grazing and agriculture, current use impacts would be expected.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, public and occupational health impacts could occur and could range from <b>SMALL</b> to <b>LARGE</b>. These impacts could be similar to those of the proposed action, but would depend on factors such as the nature of the facility and the population density in the area and its proximity to the facility.</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Public and Occupational Health (Cont.)	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>Assessment of potential radiological impacts from facility operations considers both public and occupational exposures to radiation, and includes exposures to workers completing facility construction during initial phases of operation. Exposure pathways include inhalation of airborne contaminants, ingestion of contaminated food crops, direct exposure from material deposited on the ground, and external exposure associated with stored UF<sub>6</sub> cylinders. Worker exposures would vary by job type, but would be carefully monitored and maintained as low as reasonably achievable (ALARA) and impacts would be SMALL.</p> <p>For a hypothetical individual member of the public at the proposed EREF property boundary and the nearest resident, the maximum annual total effective dose equivalents would be 0.014 millisievert per year (1.4 millirem per year) and <math>2.1 \times 10^{-6}</math> millisievert per year (<math>2.1 \times 10^{-4}</math> millirem per year), respectively. This equates to impacts from exposure of members of the public that would be SMALL.</p> <p>Dose equivalents attributable to operation of the proposed EREF would be small compared to the normal background radiation range of 2.0 to 3.0 millisievert</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p>



**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Public and Occupational Health (Cont.)	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>(200 to 300 millirem) dose equivalent. This equates to radiological impacts during operation of the proposed EREF that would be SMALL.</p> <p>The nature of decommissioning activities would be similar to those during construction and operation. Impacts from occupational injuries and illnesses and chemical exposures would be SMALL. Occupational radiological exposures would be bounded by the potential exposures during operation, because the quantities of uranium material handled would be less than or equal to that during operations. An active environmental monitoring and dosimetry (external and internal) program would be conducted to maintain ALARA doses to workers and to individual members of the public. Therefore, the impacts of decommissioning on public and occupational health would be SMALL.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p>
Waste Management	<p>SMALL. Construction would generate about 6116 cubic meters (8000 cubic yards) of nonhazardous solid waste, in addition to scrap structural steel, sheet metal, piping, etc., that would be recycled. About 23,000 liters (6200 gallons) and 1000 kilograms (2200 pounds) of hazardous waste would be generated annually. Disposal impacts would be SMALL because there is adequate disposal capacity at the appropriate disposal facilities.</p>	<p>SMALL. No EREF construction, operational, or decommissioning wastes (including sanitary, hazardous, low-level radioactive, or mixed wastes) would be generated or require disposition. Local impacts from waste management would be SMALL as under current site conditions.</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Waste Management (Cont.)	<p><i><b>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</b></i></p> <p>Annually, during operations, generation of approximately 70,307 kilograms (154,675 pounds) of industrial, nonhazardous, nonradioactive solid waste and approximately 146,400 kilograms (322,080 pounds) of low-level radioactive waste (not including depleted UF<sub>6</sub>) are expected. The proposed facility would also generate approximately 5062 kilograms (11,136 pounds) of hazardous wastes and 100 kilograms (220 pounds) of mixed waste annually. All wastes would be transferred to offsite licensed waste disposal facilities with adequate capacity for the proposed EREF wastes. Therefore, impacts during operations would be SMALL.</p> <p>Liquid process effluents would be treated and discharged by evaporation to the atmosphere. No process effluents from plant operations would be discharged to the retention or detention basins or into surface water. Impacts due to process water discharges from operations of the proposed EREF would be SMALL.</p>	<p><i><b>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</b></i></p> <p>Should another domestic enrichment facility be constructed at an alternate location, waste management impacts could occur and could range from SMALL to LARGE. These impacts could be similar to those of the proposed action but would depend on factors such as the nature of the facility and availability of waste disposal sites.</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Waste Management (Cont.)	<p>The proposed EREF is expected to generate 1222 cylinders of depleted UF<sub>6</sub> annually, which would be temporarily stored on an outdoor cylinder storage pad. Storage of depleted UF<sub>6</sub> tails cylinders at the proposed site would occur for the duration of, but not beyond, the proposed facility's 30-year operating lifetime. An active cylinder maintenance program for stored cylinders such as that proposed by AES would result in a SMALL impact for cylinder storage.</p> <p>During decommissioning, materials eligible for recycling would be sampled or surveyed to ensure that contaminant levels would be below release limits. Radioactive material from decontamination and contaminated equipment would be packaged and shipped offsite to an appropriately licensed facility. Waste disposal would include approximately 7700 cubic meters (10,070 cubic yards) of low-level radioactive waste. Due to the availability of adequate disposal capacity, waste management impacts would be SMALL.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Socioeconomics	<p><b><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></b></p> <p>SMALL. The economic impacts of the proposed EREF project are evaluated for an 11-county region of influence (ROI) in Idaho – including Bannock, Bingham, Blaine, Bonneville, Butte, Caribou, Clark, Fremont, Jefferson, Madison, and Power Counties – which encompasses the area that is expected to be the primary source of labor for each phase of the proposed project, and where workers employed during construction and operation of the proposed EREF are expected to live and spend most of their salaries. The 11-county ROI is also the area in which a significant portion of site purchase and non-payroll expenditures are expected to occur. The impacts of the EREF on population, housing, and community services are assessed for the two-county ROI, consisting of Bingham and Bonneville Counties, where most in-migrating construction and operations workers are likely to live, and where the majority of economic impacts would occur.</p> <p>The impacts of facility construction and operation would be SMALL. There would be increases in regional employment, income, and tax revenue during construction and operation. Wage and salary spending and expenditures associated with materials, equipment, and supplies would produce income and employment and local and State tax revenue. Although these impacts</p>	<p><b><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></b></p> <p>SMALL. Any beneficial or adverse consequences of the proposed action would not occur. Socioeconomic conditions in the ROI would remain unchanged, and the impact of no action would be SMALL.</p> <p>Population in the area surrounding the proposed EREF, in Bonneville and Bingham Counties, is expected to grow in accordance with current projections, with the total population in the region projected to be approximately 156,491 in 2013 and 168,331 in 2017. In addition to population growth, the social characteristics of the region, including housing availability, school enrollment, and availability of law enforcement and fire-fighting resources, are expected to change over time. However, future changes in these characteristics are difficult to quantify, and no projections of their future growth are available.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, socioeconomic impacts could occur and could range from SMALL to LARGE. These impacts could be similar to those of the proposed action,</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Socioeconomics (Cont.)	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>would be SMALL compared to the 11-county economic baseline, they are generally considered to be positive. Construction would create 1687 jobs and \$65.0 million in the peak year, while operations would produce 3289 jobs and \$92.4 million in income in the first year of operations.</p> <p>In-migration into the two-county ROI during construction and operation of the facility would also impact area housing resources and community services such as schools and law enforcement, and the availability and cost of public utilities such as electricity, water, sanitary services, and roads. These impacts could be negative if significant population in-migration were to occur; however, impacts would be SMALL.</p> <p>Decommissioning would provide continuing employment opportunities for the existing workforce and for other residents of the 11-county ROI. Expenditures on salaries and materials would contribute to the area economy, although less than during operations, and the State would continue to collect sales tax and income tax revenues. The socioeconomic impact of decommissioning activities would be SMALL.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p> <p>but would depend on the nature of the facility and on existing socioeconomic factors in the ROI associated with the alternate facility location.</p>

**Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)**

Affected Environment	Proposed Action	No-Action Alternative
Environmental Justice	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>SMALL. The majority of the environmental impacts on environmental resources associated with construction and operation of the proposed EREF would be mostly SMALL, and generally would be mitigated where necessary. For these resource areas, the associated impacts on all human populations would be SMALL, so there would not be any disproportionately high and adverse impacts on minority or low-income populations. Resources for which environmental impacts would be MODERATE are expected to most directly affect residents in the immediate area of the proposed EREF, but because there are no low-income or minority populations defined according to CEQ guidelines within the 4-mile area around the proposed facility, operation of the proposed facility also would not be expected to result in disproportionate impacts on low-income or minority residents, and therefore would not produce any environmental justice concerns.</p> <p>Impacts of decommissioning would be SMALL. Because impacts on the general population would generally be SMALL to MODERATE in other resource areas and because there are no low-income or minority populations defined according to CEQ guidelines within the 4-mile area around the proposed facility, decommissioning would not be expected to result in disproportionately high or adverse impacts on minority or low-income populations.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p> <p>SMALL. The no-action alternative would not be expected to cause any high and adverse impacts; it would not raise any environmental justice issues. Therefore, any impacts would be SMALL.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, environmental justice impacts could occur and could range from SMALL to LARGE. These impacts would depend on factors such as the nature of the impact significance levels and populations impacted by the facility at the alternate location.</p>



Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)

Affected Environment	Proposed Action	No-Action Alternative
	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p>
<p>Accidents</p>	<p>SMALL to MODERATE. A range of six hypothetical facility accidents were considered. The accidents include a criticality accident and the remaining five accidents were representative accident scenarios that varied in severity from high- to intermediate-consequence events, including accidents initiated by natural phenomena (earthquake), operator error, and equipment failure. The latter five accidents could cause varying amounts of UF<sub>6</sub> to be released, resulting in potential exposure to UF<sub>6</sub> and its reaction products with humidity in the air, UO<sub>2</sub>F<sub>2</sub>, and HF. All credible accidents at the proposed EREF were considered. The consequence of a criticality accident would be high (fatality) for a worker in close proximity. Worker health consequences are low to high from five scenarios involving the release of UF<sub>6</sub> due to uranium and/or HF chemical exposure. Radiological consequences to a maximally exposed individual (MEI) at the Controlled Area Boundary (proposed EREF property boundary) are low for all six accidents including the criticality accident. Uranium chemical exposure to the MEI is high for one accident and low for the remainder. For HF exposure to an MEI at the proposed property boundary, the consequence of three accidents is intermediate, with a low consequence estimated for the remainder. All accident scenarios predict consequences to the collective offsite public of less than one lifetime cancer fatality. Impacts</p>	<p>SMALL. Under the no-action alternative, potential accidents and accident consequences from operation of the proposed EREF would not occur.</p> <p>Should another domestic enrichment facility be constructed at an alternate location, accident impacts could occur and could range from SMALL to LARGE. These impacts could be similar to those of the proposed action, but would depend on the nature of the facility at the alternate location.</p>

Table 2-6 Summary of Environmental Impacts for the Proposed Action and the No-Action Alternative (Cont.)

Affected Environment	Proposed Action	No-Action Alternative
Accidents (Cont.)	<p><i>AES would construct, operate, and decommission the proposed EREF in Bonneville County, Idaho.</i></p> <p>from accidents would be SMALL to MODERATE. Plant design, passive and active engineered controls, and administrative controls would reduce the likelihood of accidents.</p>	<p><i>The proposed EREF would not be constructed, operated, and decommissioned. Enrichment services would be met with existing domestic and foreign uranium enrichment suppliers and other planned or future facilities.</i></p>

1  
2

1 A standard of significance has been established for assessing environmental impacts. Based  
2 on the Council on Environmental Quality's regulations (40 CFR 1508.27), each impact is to be  
3 assigned one of the following three significance levels:  
4

- 5 • SMALL. The environmental effects are not detectable or are so minor that they would  
6 neither destabilize nor noticeably alter any important attribute of the resource.  
7
- 8 • MODERATE. The environmental effects are sufficient to noticeably alter but not destabilize  
9 important attributes of the resource.  
10
- 11 • LARGE. The environmental effects are clearly noticeable and are sufficient to destabilize  
12 important attributes of the resource.  
13

14 These impact levels are used in the summary and comparison of alternatives in Table 2-6.  
15

## 16 **2.5 Staff Recommendation Regarding the Proposed Action** 17

18 After weighing the impacts of the proposed action and comparing the proposed action and the  
19 no-action alternative, the NRC staff, in accordance with 10 CFR 51.91(d), sets forth its NEPA  
20 recommendation regarding the proposed action.  
21

22 The NRC staff recommends that, unless safety issues mandate otherwise, the proposed license  
23 be issued to AES. In this regard, the NRC staff has concluded that environmental impacts are  
24 generally SMALL, and application of the environmental monitoring program described in  
25 Chapter 6 and the proposed AES mitigation measures discussed in Chapter 5 would eliminate  
26 or substantially lessen any potential adverse environmental impacts associated with the  
27 proposed action.  
28

29 The NRC staff has concluded that the overall benefits of the proposed EREF outweigh the  
30 environmental disadvantages and costs based on consideration of the following:  
31

- 32 • The need for an additional economical domestic source of enrichment services.  
33
- 34 • The environmental impacts from the proposed action are generally SMALL, although they  
35 could be as high as MODERATE for certain aspects of the areas of historic and cultural  
36 resources, visual and scenic resources, ecological resources, and transportation and as  
37 high as LARGE for certain aspects of air quality on a temporary basis.  
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1  
2  
3 **3 AFFECTED ENVIRONMENT**

4 This chapter describes the existing regional and local environmental conditions at and near the  
5 site of the proposed AREVA Enrichment Services, LLC (AES) Eagle Rock Enrichment Facility  
6 (EREF) before any preconstruction activities are performed and prior to the proposed action.  
7 After an initial overview of the proposed site location and activities, this chapter presents  
8 information on land use; historic and cultural resources; visual and scenic resources;  
9 climatology, meteorology, and air quality; geology, minerals, and soils; water resources;  
10 ecological resources; noise; transportation; public and occupational health; socioeconomics;  
11 and environmental justice. This information forms the basis for assessing the potential impacts  
12 of the proposed action in Chapter 4.

13 **3.1 Site Location and Description**

14  
15 The proposed EREF site is located in eastern Idaho in Bonneville County, approximately  
16 32 kilometers (20 miles) west of Idaho Falls, Idaho, along US 20 and 117 kilometers (70 miles)  
17 west of the Idaho/Wyoming border (Figure 3-1). Idaho Falls, the closest population center, is  
18 located at the cross-junction of Interstate 15 (I-15) with US 20 and US 26. Approximately  
19 2 kilometers (1 mile) to the west of the proposed EREF property is the Idaho National  
20 Laboratory (INL), a large Federal Government-owned research laboratory that encompasses  
21 230,321 hectares (890 square miles or 569,135 acres).  
22

23 The proposed EREF property consists of approximately 1700 hectares (4200 acres) to be  
24 purchased by AES from a single landowner. The proposed EREF site would occupy  
25 approximately 186 hectares (460 acres) within this area. An additional 53 hectares (132 acres)  
26 will be disturbed during preconstruction and construction by excavation of underground utilities  
27 and by temporary use for construction facilities, material storage, and parking. The proposed  
28 site and surrounding area within the proposed property boundary consist of rangeland,  
29 nonirrigated seeded pasture, and irrigated cropland. Wheat, barley, and potatoes are grown on  
30 389 hectares (962 acres) of the irrigated land (AES, 2010). Aside from the areas devoted to  
31 crops, the predominant plant type in the area is sagebrush steppe, which is seasonally grazed.  
32

33 **3.2 Land Use**

34  
35 This section describes the land uses in and near the proposed EREF property to be purchased  
36 by AES and the proposed EREF site within that property. This area includes the 186 hectares  
37 (460 acres) that the proposed EREF industrial site itself will occupy, plus an additional  
38 53 hectares (132 acres) that will be temporarily disturbed during preconstruction and  
39 construction. Therefore, this is the area that would be directly affected by preconstruction,  
40 construction, operation, and decommissioning of the proposed EREF.  
41

42 The following discussion focuses on the region within 8 kilometers (5 miles) of the proposed  
43 EREF site. The proposed EREF site is located in Bonneville County; however, both Jefferson  
44 County to the north and Bingham County to the west are within 8 kilometers (5 miles) of the  
45 proposed EREF site. As a result, land use in all three counties is discussed below. Special  
46 land use classification areas are also discussed.  
47  
48

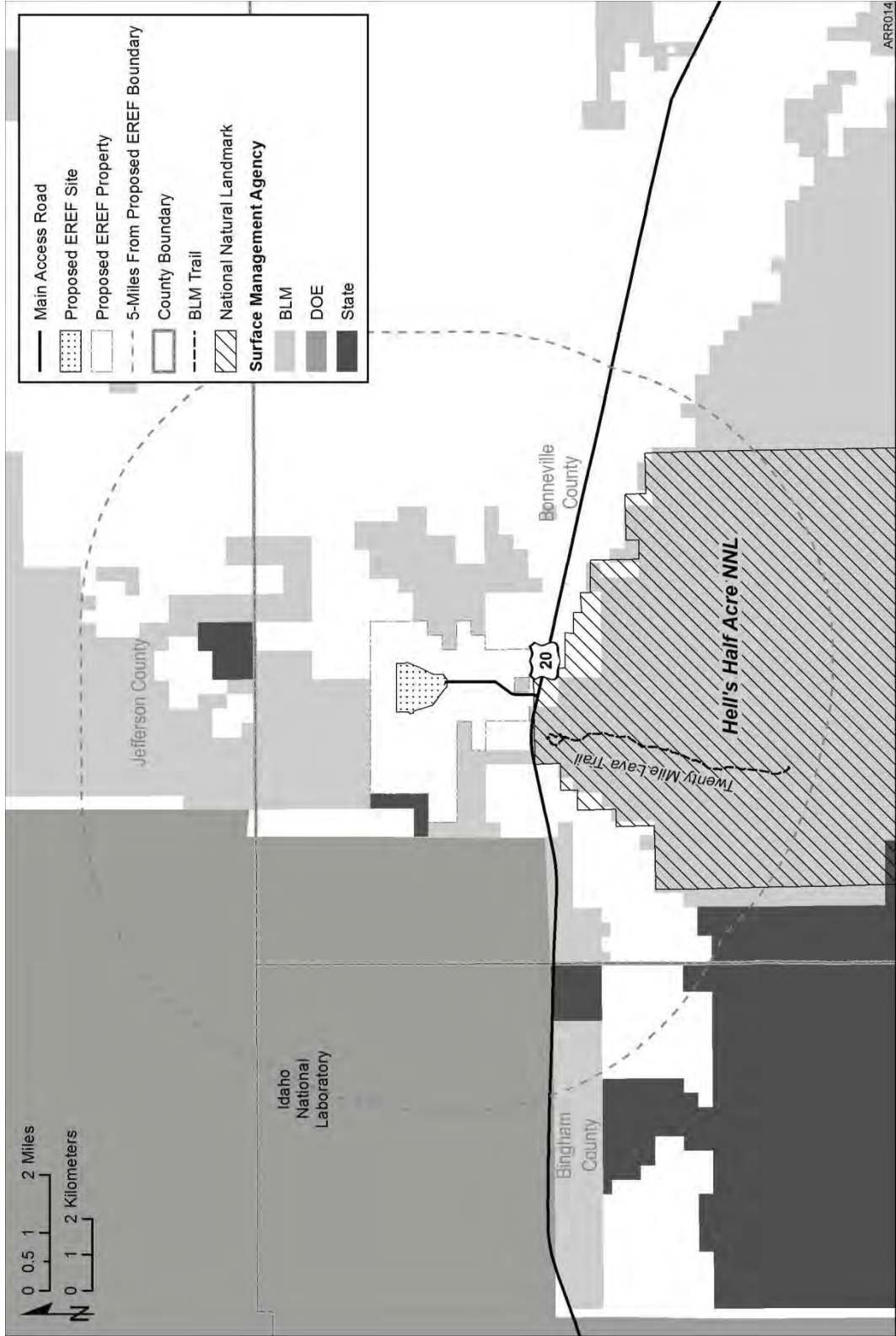


Figure 3-1 Location of Proposed Eagle Rock Enrichment Facility

1 **3.2.1 Bonneville County and Proposed EREF Property**  
2

3 Bonneville County is located in southeastern Idaho. The largest community in the county is  
4 Idaho Falls, the county seat, with a population of 101,667 as of the 2000 Census. Idaho Falls is  
5 located 32 kilometers (20 miles) east of the proposed EREF site. No other large cities are found  
6 in Bonneville County. Based on the available land use data for the county, the dominant land  
7 use is cultivated crops (17 percent), with undeveloped sagebrush or woodlands being the next  
8 largest land use (14 percent). Less than 3 percent of the land in the county is developed  
9 (USGS, 2009g).

10  
11 The 1700-hectare (4200-acre) parcel of land to be purchased by AES is bordered on the west  
12 by State-owned land and to the south and east by U.S. Bureau of Land Management (BLM)-  
13 managed lands as shown in Figure 3-2. The BLM land is managed for multiple uses, which  
14 include grazing and hunting (Reynolds, 2010). Also, there is private land to the northeast and  
15 south. To the north and west is the INL, which is a U.S. Department of Energy (DOE) applied  
16 engineering laboratory that covers approximately 2306 square kilometers (890 square miles).  
17 Much of the INL property is an undeveloped sagebrush-steppe environment. Laboratory  
18 complexes are scattered throughout the INL property. The nearest INL complex to the  
19 proposed EREF site is the Materials and Fuels Complex located approximately 18 kilometers  
20 (11 miles) to the west. South of the proposed EREF site is the Hell's Half Acre National Natural  
21 Landmark (NNL) and Wilderness Study Area (WSA). A lava flow occurred in this location  
22 approximately 4100 years ago. The lava flow covers 57,498 hectares (222 square miles) of the  
23 Idaho desert. (See Section 3.2.4 for more discussion of Hell's Half Acre.) Farming occurs  
24 northeast and southeast of the proposed EREF site. The nearest residence to the proposed  
25 EREF site is 8 kilometers (5 miles) to the east.

26  
27 Land use within the 1700-hectare (4200-acre) parcel of land to be purchased by AES is  
28 primarily cultivated cropland (43 percent), followed by sagebrush-steppe (36 percent) and  
29 pasture/hay (7 percent), with the remainder being open space and upland grasslands  
30 (14 percent) (USGS, 2009g). A few agricultural buildings are located along US 20 near the  
31 south end of the proposed EREF property. There are no existing rights-of-way (ROWs) within  
32 the proposed EREF property. The proposed EREF property consists entirely of private land.  
33 Within the proposed property, there is a 16-hectare (40-acre) parcel of land managed by the  
34 BLM. AES has no plans to purchase the BLM parcel (AES, 2010). The 16-hectare parcel is  
35 surrounded by the proposed EREF property. Adjacent to an access road being purchased for  
36 the proposed project are two 6.5-hectare (16-acre) parcels on which the Federal Government  
37 previously held uranium land patents. The uranium leases have been relinquished  
38 (42 U.S. Code (U.S.C.) 2098 Sec. 68b). Some of the land located within the proposed property  
39 was designated as prime farmland by the U.S. Natural Resources Conservation Service  
40 (NRCS). The use of prime farmland is subject to review under the *Federal Farmland Protection*  
41 *Policy Act* (FPPA) (see Title 7 of the U.S. *Code of Federal Regulations* (7 CFR 658.2). Per  
42 7 CFR 658.2 (c)(1)(i), the intent of this Act is to protect prime farmland from other uses as the  
43 result of certain Federal actions. The Act does not apply to Federal permitting or licensing  
44 actions on private lands, such as the potential licensing of the proposed EREF by the NRC. In  
45 May 2010, DOE issued a conditional commitment for a Federal loan guarantee to AES for the  
46 proposed EREF (DOE, 2010a). Issuing a loan guarantee is subject to review under the FPPA  
47 to assess the effect of the project associated with the loan guarantee on prime farmland. DOE  
48 has conducted and submitted the required farmland conversion impact analysis to the NRCS



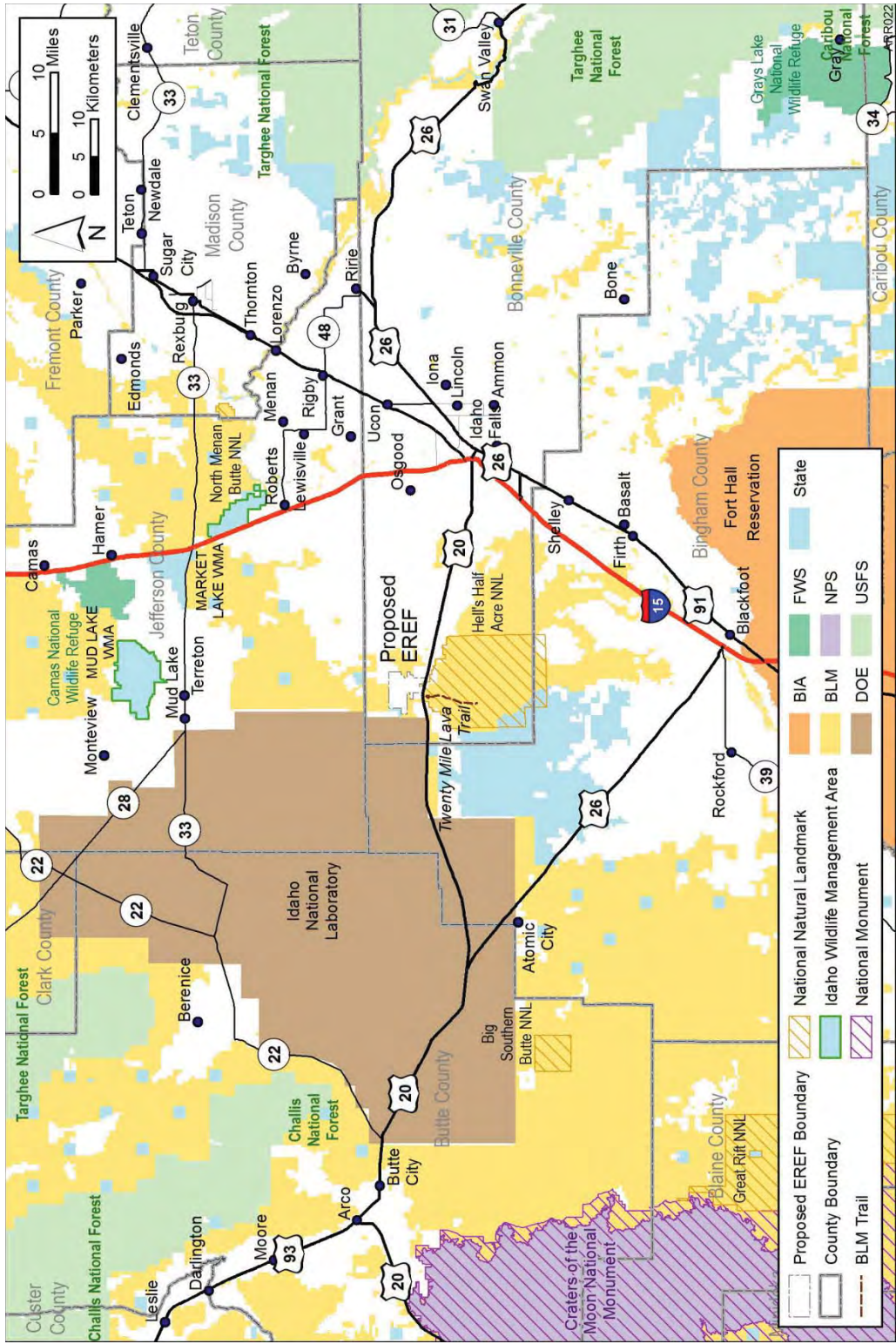


Figure 3-2 Special Land Use Classification Areas (BLM, 2009a; IDFG, 2010)



1 (DOE, 2010b). The issuance of the Federal loan guarantee is not a factor in the NRC's decision  
2 to issue a license.

3  
4 The proposed EREF property is zoned by Bonneville County as Grazing Zone G-1. The zoning  
5 allows for manufacturing, testing, and storage of materials or products considered to be  
6 hazardous. Areas with this zoning designation are generally large tracts of open land. The  
7 purpose of the zone is to allow for certain uses and activities that should be conducted in  
8 locations removed from densely populated areas of the county. There are no building size or  
9 height restrictions within this zoning designation (Serr, 2009).

### 10 11 **3.2.2 Bingham County**

12  
13 Bingham County is located approximately 6 kilometers (4 miles) west of the proposed EREF  
14 site. The county seat of Bingham County is Blackfoot, located 43 kilometers (27 miles) south of  
15 the proposed site. The population of Blackfoot was 10,419 in the 2000 Census. Atomic City,  
16 32 kilometers (20 miles) west of the proposed EREF site, is the nearest community in Bingham  
17 County to the proposed EREF. The population of Atomic City was reported as 25 in the  
18 2000 Census. The portion of the county within 8 kilometers (5 miles) of the proposed EREF site  
19 is zoned natural resources/agricultural (Halstead, 2009). Land use in the county consists  
20 primarily of rangeland (46.8 percent), with agricultural land (31.7 percent) and barren lands  
21 (14.9 percent) being the other main land uses (Bingham County, 2005). The primary  
22 agricultural products from Bingham County in 2002 were wheat and potatoes (USDA, 2002).

### 23 24 **3.2.3 Jefferson County**

25  
26 Jefferson County is located directly north of the proposed EREF site. The portion of the county  
27 that falls within 8 kilometers (5 miles) of the proposed EREF site is zoned Agricultural Forty  
28 Zone (Ag. 40 Acres) (Jefferson County, 2008). This zone allows for agricultural uses and the  
29 development of residential lots that are minimally 16 hectares (40 acres) in size (Jefferson  
30 County, 2005). Industrial uses are not permitted within this zoning designation. The nearest  
31 town in Jefferson County to the proposed site is Rigby, approximately 42 kilometers (26 miles)  
32 to the northeast. Rigby has a population of 2998 (2000 Census). Land use in Jefferson County  
33 is dominated by undeveloped sagebrush and rangeland (56 percent) and cultivated cropland  
34 and pasture (39 percent), with only minimal development (3 percent) (USGS, 2009g).

### 35 36 **3.2.4 Special Land Use Classification Areas**

37  
38 There are ten special land use areas near the proposed EREF site (Figure 3-2). The closest is  
39 Hell's Half Acre WSA just south of US 20, approximately 2 kilometers (1 mile) from the  
40 proposed site. A WSA is a BLM management designation for areas that (1) have retained their  
41 naturalness, with the imprint of man's work substantially unnoticeable; (2) are large (at least  
42 2023 hectares [5000 acres]); and (3) have outstanding opportunities for solitude or for primitive  
43 or unconfined types of recreation in at least parts of the areas. Retaining wilderness  
44 characteristics is achieved by limiting road access and not allowing mineral leasing within a  
45 WSA. The northern portion of the Hell's Half Acre WSA was named a National Natural  
46 Landmark (NNL) in 1973. National Natural Landmarks are chosen by the Secretary of the  
47 Interior to recognize some of the best examples of biological or geological resources in the  
48 nation. National Natural Landmarks are designated by the National Park Service. There are

1 three additional NNLs in the region: Big Southern Butte NNL (51 kilometers [32 miles] to the  
2 southwest), North Menan Butte NNL (32 kilometers [20 miles] to the northeast), and Great Rift  
3 NNL (72 kilometers [45 miles] to the southwest). The 750,000-acre Craters of the Moon  
4 National Monument and Preserve is 80 kilometers (50 miles) west of the proposed EREF site; it  
5 is managed by the National Park Service and the BLM. There are two national forests located  
6 northwest of the INL property; these are the Challis National Forest (48 kilometers [30 miles]  
7 northwest) and the Targhee National Forest (48 kilometers [30 miles] north northwest).  
8 The Mud Lake Wildlife Management Area (WMA), located 35 kilometers (22 miles) north of the  
9 proposed site, and Market Lake WMA, located 32 kilometers (20 miles) northeast, are both  
10 managed for hunting by the Idaho Department of Fish and Game (IDFG). Camas National  
11 Wildlife Refuge is 43 kilometers (27 miles) north of the proposed EREF site and is managed by  
12 the U.S. Fish and Wildlife Service (FWS). Fort Hall Indian Reservation is 60 kilometers  
13 (37 miles) south of the proposed EREF site and is the property of the Shoshone-Bannock  
14 Tribes. The reservation was established in 1868 by the Fort Bridger Treaty.

### 16 **3.3 Historic and Cultural Resources**

17  
18 This section describes the prehistoric and historic background of the area.

#### 20 **3.3.1 Prehistoric**

21  
22 The prehistory of southern Idaho is divided into the Early Prehistoric Period (13,000 B.C. to  
23 5500 B.C.), the Middle Prehistoric Period (5500 B.C. to A.D. 700), and the Late Prehistoric  
24 Period (A.D. 700 to A.D. 1700). The Clovis and Folsom cultures are associated with the Early  
25 Prehistoric Period. These cultures relied on hunting large mammals for survival. The climate  
26 was cooler and wetter than today. Projectile points associated with the Early Prehistoric  
27 Period's Folsom culture have been found at sites within a mile of the proposed EREF site.  
28 There is evidence of more intensive use of local resources during the Middle Prehistoric Period.  
29 Grinding stones for processing plant food are commonly found on Middle Prehistoric  
30 archaeological sites. Large spear points were used during the Early Prehistoric Period. Smaller  
31 darts from the Middle Prehistoric Period suggest the hunting of smaller game. There were large  
32 climatic fluctuations during the Middle Prehistoric Period. The Late Prehistoric Period is marked  
33 by the introduction of the bow and arrow and the use of pottery. Most evidence suggests that  
34 mobility and hunting remained important parts of the subsistence strategies of the late  
35 prehistoric cultures. Sedentary seasonal farming along major rivers was more prevalent during  
36 the Late Prehistoric Period (INL, 2007).

#### 38 **3.3.2 Protohistoric and Historic Indian Tribes**

39  
40 Three tribal groups are known to have been in the vicinity of the proposed site during the  
41 protohistoric period (A.D. 1700 to 1850). They were the Shoshone, Paiute, and Bannock  
42 (Ringhoff et al., 2008). These groups engaged in seasonal rounds of foraging during which they  
43 exploited various resources. The lifeways of protohistoric tribes were greatly modified after  
44 1700 with the introduction of horses. The increased mobility allowed by the horse expanded the  
45 ranges of these groups and altered many of their customs. These were the same tribes that  
46 were present in the historic period.

47

1 **3.3.3 Historic Euro-American**  
2

3 Historic use of the area began in the early 1800s when trappers came into the area to collect  
4 beaver skins. More intensive use of the land began in 1852 with the establishment of Goodale's  
5 Cutoff in the northern portion of what is now the INL property. The cutoff began as a northern  
6 extension of the Oregon Trail. By 1860, the route began to be used for moving cattle and sheep  
7 from Oregon and Washington to eastern markets. From the 1860s to 1880s, numerous gold  
8 and other precious metal mines began to open in central Idaho, which led to increased traffic on  
9 Goodale's Cutoff and the creation of numerous other roads and trails through the area.  
10 Ranches were established along the Big Lost River by the 1880s where livestock was raised  
11 and then transported across what would become INL. Populations began to rise steadily with  
12 passage of the *Carey Land Act of 1894* and the *Desert Reclamation Act of 1902*, which set  
13 aside a million acres of public lands for homesteading and provided funds to aid in development  
14 of irrigation systems, respectively (INL, 2007).  
15

16 By the early 20th century, the town of Powell had been established on the INL property near the  
17 intersection of the Oregon Shortline Railroad (now the Union Pacific Railroad) and the Big Lost  
18 River. The town was located near the current location of INL's Radioactive Waste Management  
19 Complex. Most of the homesteads failed by the 1920s and were abandoned due to a lack of  
20 available water resulting from extensive water use upstream of the INL property for irrigation  
21 (INL, 2007).  
22

23 **3.3.4 Historic and Archaeological Resources in the Vicinity of the Proposed Site**  
24

25 Significant archaeological sites are found in the vicinity surrounding the proposed EREF  
26 property. One of the most important sites found in the region is the Wasden Complex located  
27 approximately 1.6 kilometers (1 mile) from the proposed EREF site. The Wasden Complex is a  
28 series of lava blister caves that contain evidence of human use dating back to at least  
29 10,000 B.C. The complex shows evidence of people hunting mammoth and a type of bison that  
30 is now extinct (INL, 2007). Complexes of this age that have direct evidence of humans hunting  
31 extinct animals are extremely rare. The complex is made up of three distinct sites. The sites  
32 contain evidence of continuous use up to the Historic Period.  
33

34 The Area of Potential Effect (APE) for the *National Historic Preservation Act of 1966* (NHPA)  
35 Section 106 review of the proposed project, as defined by the U.S. Nuclear Regulatory  
36 Commission (NRC), is the 240-hectare (592-acre) portion of the proposed site that would be  
37 directly affected by preconstruction and construction activities. Archaeological surveys have  
38 been undertaken by AES's archaeological contractor for the proposed project. The contractor  
39 directly examined 381 hectares (941 acres) of the proposed EREF property  
40 (Ringhoff et al., 2008), within which the 240-hectare (592-acre) APE is included. The acreage  
41 surveyed included additional areas for expansion outside the presently proposed construction  
42 and operations areas, which are no longer deemed necessary for the proposed project. An  
43 additional 26 hectares (64 acres) was surveyed in 2009 due to changes in the project design  
44 (Estes and Raley, 2009). This brought the amount of land surveyed for historic and cultural  
45 resources to 407 hectares (1005 acres). The AES surveys identified 13 archaeological sites  
46 and 24 isolated finds within the APE. Isolated finds are isolated occurrences of cultural  
47 resource material that are not associated with subsurface remains and are not considered  
48 archaeological sites. Three of the archaeological sites were prehistoric in age, six were from

1 the historic era, and four contained evidence from both the historic and prehistoric periods  
2 (Ringhoff et al., 2008). The prehistoric sites consisted of stone tools or evidence of stone tool  
3 manufacture. The historic sites were primarily historic trash scatters consisting of cans and  
4 glass. None of the isolated finds are considered eligible for listing on the NRHP. On the basis  
5 of the survey results, nine of the sites were recommended not eligible for listing on the *National*  
6 *Register of Historic Places* (NRHP). One site, the John Leopard Homestead (MW004), is  
7 recommended eligible for listing on the NRHP for its potential to provide information on the  
8 practices of historic era farmers in the region. Several other sites of this type have been  
9 previously identified on INL property north of the proposed EREF site (Gilbert, 2010). MW004  
10 consists of several structural remains including a cistern, privy, and historic dugout house  
11 foundation. AES's archaeological contractor recommended additional research for three other  
12 sites found during the survey (MW002, MW012, and MW015). Subsequently, AES's  
13 archaeological contractor found that these three sites lacked sufficient information to be  
14 considered significant (Ringhoff et al., 2008).

15  
16 The NRC conducted a file search for the 1700-hectare (4200-acre) parcel. The file search  
17 revealed that the proposed EREF property had not been previously surveyed for the presence  
18 of historic and cultural resources (i.e., prior to AES's license application); therefore, no  
19 resources were previously known. The file search identified seven previously recorded  
20 archaeological sites within one mile of the proposed EREF. Three of the sites are associated  
21 with the Wasden Complex (10BV30, 10BV31, and 10BV32) and are all eligible for listing on the  
22 NRHP. 10BV30 is known as Owl Cave and contains some of the only known evidence of early  
23 prehistoric peoples in association with extinct mammoth bones. 10BV31 is known as Coyote  
24 Cave and also contains extensive evidence of human use. The final site associated with the  
25 Wasden Complex is 10BV32, which is also a collapsed lava tube. A fourth site (10BV47)  
26 consisted of a fluted spear point and associated materials and is considered eligible for listing  
27 on the NRHP. No information was available for the remaining three sites (10BV83, 10BV84,  
28 and 10BV87).

### 30 **3.4 Visual and Scenic Resources**

31  
32 This section describes the visual and scenic resources in the vicinity of the proposed EREF.

33  
34 The proposed EREF site is on undeveloped land 32 kilometers (20 miles) west of Idaho Falls,  
35 Idaho. The main portion of the proposed facility would be located approximately 3 kilometers  
36 (1.7 miles) north of US 20 (Figure 3-3). The tallest structures at the proposed facility would be  
37 approximately 20 meters (65 feet) high. The area is gently rolling, sagebrush semi-desert, with  
38 some high points (Figure 3-4). The tallest vegetation on the proposed property is sagebrush  
39 that stands approximately 1 meter (3 feet) tall. The highest point in the vicinity of the proposed  
40 project is Kettle Butte, which is located 1.2 kilometers (0.75 mile) east of the proposed EREF  
41 (Figure 3-5). Larger buttes are visible in the distance. The eastern portion of the proposed  
42 EREF site is currently used for agriculture. Single-story agriculture storage structures are  
43 located adjacent to US 20 on the proposed property in the vicinity of the proposed EREF site  
44 (Figure 3-6). The nearest residence is 7.7 kilometers (4.8 miles) east of the proposed site along  
45 US 20.





1

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**Figure 3-3 Photo of the Proposed EREF Site Area (AES, 2010)**



4

5

**Figure 3-4 Center of Proposed EREF Site Area Facing South (AES, 2010)**



1

2

3

4

**Figure 3-5 Photo from US 20 Facing North  
(Note butte in distance.) (Argonne staff photo)**



5

6

**Figure 3-6 Agricultural Sheds near Proposed EREF Site Area (AES, 2010)**





1

2 **Figure 3-7 Hell's Half Acre National Natural Landmark (Argonne staff photo)**

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The lands immediately surrounding the proposed property to the west, north, and east are primarily covered in sagebrush semi-desert. The land to the west and north is managed by BLM and currently used for grazing and multiple use, a BLM land management designation (Reynolds, 2010). The land to the south of US 20 is a mix of private and BLM-managed land. Some of the private land to the southeast is under cultivation. Much of the land south of the proposed site is the remains of a 4000-year-old lava flow, which is managed by the BLM as Hell's Half Acre WSA (Figure 3-7). See Section 3.2.4 for a description of WSA and NNL.

Another visually sensitive resource in the vicinity of the proposed project is the Wasden Complex, a significant archaeological complex. See Section 3.3.4 for a discussion of the Wasden Complex.

BLM has developed a visual resource management (VRM) system to manage the resources under its control (BLM, 2009b). Even though the BLM's VRM system is officially applicable only to BLM land, it does provide a useful tool for generally inventorying and managing visual resources. The system has two main components. The first is the visual resource inventory (VRI), which attempts to establish the inherent visual qualities of an area, assess whether the public has any concerns related to scenic quality for a location, and determine if there are key observation points for a given location. The inventory characterizes the visual appeal of a location and is discussed further below. The second component of the system is the VRM rating, which reflect the management decisions made by the BLM defining how they will manage the visual resources in a given location. There are four levels of VRM rating, designated as VRM Classes I to IV, with VRM Class I being the most restrictive and protective of the visual landscape and IV being the least restrictive. VRM Class I areas are managed to

1 preserve their existing visual character. VRM II areas are managed to retain their existing visual  
2 character; VRM III areas are managed to partially retain their existing visual character; and  
3 VRM IV areas are those that allow major modification of the existing visual character of the  
4 landscape.

5  
6 The Hell's Half Acre WSA has a VRM rating of I, which indicates that the BLM has decided to  
7 manage the area to retain its existing character. Under VRM I, the level of change must not  
8 attract viewer attention. The lands surrounding the WSA and the property to be purchased by  
9 AES are designated as VRM II by the BLM. They are managed to retain their existing visual  
10 character. Changes in the characteristics of the location should be low and should not attract  
11 the attention of a viewer (BLM, 2009b).

12  
13 The BLM VRI process involves evaluating the visual landscape to determine the (1) sensitivity  
14 of the location for visual intrusions, (2) scenic qualities of the location, and (3) distance from  
15 which the location would be viewed. Sensitivity refers to the public's concern or expectation for  
16 scenic quality. Sensitivity is based on the types of users that would view the location  
17 (e.g., recreational users, commuters, or workers), the amount of use, public interest, and  
18 adjacent land uses. Distance considerations are a factor when determining visual resource  
19 inventory values and associated impacts. The proposed EREF site is located within  
20 3 kilometers (2 miles) of US 20, which would place it in the foreground-middleground zone  
21 where visual intrusions are very obvious, as opposed to the distant background where they are  
22 less obvious. Visual intrusions in this zone typically have the greatest apparent contrast  
23 because they are highly visible from key observation points.

24  
25 Sensitivity is an important factor in the VRI process because it addresses the expectation for  
26 pristine environments. The proposed EREF property is in a relatively undeveloped setting.  
27 US 20 is most heavily used by workers commuting to INL. Other people traveling US 20 include  
28 farmers going to their fields and tourists visiting the Hell's Half Acre WSA. The public has not  
29 expressed any opinions indicating a preference for or against maintaining the current visual  
30 situation (see Appendix A). Uses for adjacent land in the immediate vicinity of the proposed  
31 property include farming and the Hell's Half Acre WSA. Most of the area surrounding the  
32 proposed EREF site is undeveloped sagebrush semi-desert. Industrial developments are found  
33 on INL, but none of them are visible from the proposed site. Sensitivity to changes in the visual  
34 landscape would be expected to be low for workers and farmers using the area and moderate to  
35 high for those using the Hell's Half Acre WSA.

36  
37 The VRI process measures the scenic quality of an area through application of the scenic  
38 quality rating criteria, which cover landforms, vegetation, water, color, adjacent scenery,  
39 scarcity, and cultural modification. The scenic quality criteria applied to a landscape are  
40 presented in Table 3-1. Examples of how to apply the criteria are presented in Table 3-2. The  
41 landform is rolling desert landscape with large open vistas (Rating 1). The vegetation is  
42 primarily sagebrush semi-desert (Rating 1). No water sources are evident from the proposed  
43 site (Rating 0). The color range in the proposed site area is various hues of green from the  
44 sagebrush environment and the agricultural fields (Rating 1). Adjacent scenery is similar to that  
45 found in the proposed site area and has little influence on the visual quality (Rating 1). Although  
46 the proposed site is adjacent to the unique geologic features associated with Hell's Half Acre  
47 WSA, the land occupied by the proposed project is not unique (Rating 1). Currently, very little  
48 by way of cultural modifications are visible in the proposed site area. Storage sheds,

**Table 3-1 Scenic Quality: Explanation of Rating Criteria**

Landform	Topography becomes more interesting as it gets steeper, more massive, or more severely or universally sculptured. Outstanding landforms may be monumental (e.g., Grand Canyon in Arizona, Sawtooth Mountain Range in Idaho, Wrangell Mountain Range in Alaska) or exceedingly artistic and subtle (e.g., certain badlands, pinnacles, arches, and other extraordinary formations).
Vegetation	Ratings give primary consideration to the variety of patterns, forms, and textures created by plant life. They consider short-lived displays when they are known to be recurring or spectacular. They also consider smaller-scale vegetative features that add striking and intriguing detail elements to the landscape (e.g., gnarled or wind-beaten trees and joshua trees).
Water	Ratings consider ingredients that add movement or serenity to a scene. The degree to which water dominates the scene is the primary consideration in selecting the rating score.
Color	Ratings consider the overall color(s) of the basic components of the landscape (e.g., soil, rock, vegetation) as they appear during seasons or periods of high use. Key factors to use when rating "color" are variety, contrast, and harmony.
Adjacent Scenery	Ratings consider the degree to which scenery outside the unit being rated enhances the overall impression of the scenery within the rating unit. The distance from which adjacent scenery influences scenery within the rating unit normally ranges from zero to 8 kilometers (5 miles), depending on the characteristics of the topography, vegetative cover, and other such factors. This criterion is generally applied to units that would normally score very low, but for which the influence of the adjacent unit would enhance the visual quality and raise the score.
Scarcity	This criterion provides an opportunity to give added importance to one or all of the scenic features that appear to be relatively unique or rare within one physiographic region. It also covers cases for which a separate evaluation of each of the key criteria does not give a true picture of the overall scenic quality of an area. It is often the case that a number of rather unspectacular elements, in the proper combination, produce the most pleasing and memorable scenery. The scarcity criterion can be used to recognize this type of area and give it the added emphasis it needs.
Cultural Modifications	Cultural modifications in the landform, water, and vegetation, as well as the addition of structures, should be considered. They may detract from the scenery in the form of a negative intrusion or complement or improve the scenic quality of a unit. They should be rated accordingly.

Source: BLM, 2007.

**Table 3-2 Scenic Quality Inventory and Evaluation Chart**

Key Factors		Rating Criteria and Score	
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops; or severe surface variation or highly eroded formations, including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing, such as glaciers. 5	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in the size and shape of landforms; or detail features that are interesting but not dominant or exceptional. 3	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. 1
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. 5	Some variety of vegetation, but only one or two major types. 3	Little or no variety or contrast in vegetation. 1
Water	Clear and clean appearing, still, or cascading white water, any of which is a dominant factor in the landscape. 5	Flowing, or else still but not dominant in the landscape. 3	Absent, or else present but not noticeable. 0
Color	Rich color combinations, variety or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snow fields. 5	Some intensity or variety in colors and contrasts of the soil, rock, and vegetation, but not a dominant scenic element. 3	Subtle color variations, contrast, or interest; generally mute tones. 1
Adjacent Scenery	Adjacent scenery greatly enhances visual quality. 5	Adjacent scenery moderately enhances overall visual quality. 3	Adjacent scenery has little or no influence on overall visual quality. 0
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. 5+	Distinctive, although somewhat similar to others within the region. 3	Interesting within its setting, but fairly common within the region. 1
Cultural Modification	Modifications add favorably to visual variety while promoting visual harmony. 2	Modifications add little or no visual variety to the area and do not introduce discordant elements. 0	Modifications add variety but are very discordant and promote strong disharmony. -4

Source: BLM, 2007.

1 agricultural crops, and US 20 are the only visible cultural modifications (Rating 0). The overall  
2 scenic quality rating is 5. According to the BLM VRI criteria, an A or high quality classification is  
3 for a rating of 19 or more. For a rating of 12 to 15, the area is considered a B, and a rating of  
4 11 or less is a C (BLM 2009). The scenic resource inventory rating for the landscape near the  
5 proposed EREF is a C, which means that the proposed EREF site does not contain a high level  
6 of scenic quality.

### 7 8 **3.5 Climatology, Meteorology, and Air Quality**

9  
10 This section describes the climatology, meteorology, and air quality of the proposed EREF site  
11 and vicinity.

#### 12 13 **3.5.1 Climatology**

##### 14 15 **3.5.1.1 Idaho**

16  
17 Idaho lies 480 kilometers (300 miles) east of the Pacific Ocean, but is nevertheless influenced  
18 by maritime air carried east by the prevailing westerly winds. The maritime influence is  
19 strongest in the northern part of the State with wet winters and dry summers. Eastern Idaho's  
20 climate is more continental in character than the western and northern portions of the State and  
21 is instead characterized as a semiarid steppe with dry winters and wet summers. Temperature  
22 patterns in the State are influenced by latitude and elevation. Precipitation patterns in Idaho are  
23 complex, with most of the moisture coming from the Pacific Ocean. Snowfall is affected by  
24 elevation and moisture availability with major mountain ranges accumulating deep snow in the  
25 winter. Floods occur most often during the spring snowmelt, but there are out-of-season floods.  
26 Fog events are extremely variable in frequency. Windstorms are not uncommon, but Idaho has  
27 no hurricanes and an extremely small incidence of tornadoes. The annual percentage of  
28 possible sunshine ranges from about 50 percent in the north to about 70 percent in the south,  
29 with lower frequencies in the winter and up to near 80 percent during July and August in the  
30 east and north (NCDC, 2009a).

##### 31 32 **3.5.1.2 Proposed EREF Site**

33  
34 The proposed EREF site lies in the middle of the Eastern Snake River Plain (ESRP), a broad,  
35 flat river valley running southwest to northeast for about 80 kilometers (50 miles). The average  
36 elevation of the valley is about 1524 meters (5000 feet) mean sea level (MSL), and it is  
37 bordered by mountain ranges rising to about 3353 meters (11,000 feet) MSL. The orientations  
38 of the valley and the bordering mountains have a significant impact on the wind flow patterns at  
39 the proposed EREF site. Air masses typically move from west to east and lose their moisture  
40 over the mountains to the west before reaching the ESRP. Thus, rainfall is generally light and  
41 the region is semiarid. The temperature regime is moderate. There is little cloud cover and  
42 generally large diurnal temperature variation (AES, 2010).

##### 43 44 **3.5.2 EREF Site Meteorology**

45  
46 Four National Weather Service (NWS) stations in the vicinity of the proposed EREF produce  
47 meteorological data that are generally representative of conditions at the proposed EREF site:  
48



- 1 • Kettle Butte (KET),
- 2
- 3 • Idaho National Laboratory (MFC),
- 4
- 5 • Idaho Falls 46 West (ID46W), and
- 6
- 7 • Idaho Falls 2 ESE (ID2ESE), an urban location.
- 8

9 These stations are all located in the ESRP, and are shown in Figure 3-8. These are the closest  
10 NWS monitoring stations to the proposed EREF site; weather data collected at these sites is  
11 therefore most representative of weather that can be expected at the proposed EREF site.

### 12 13 **3.5.2.1 Temperature**

14  
15 Figure 3-9 presents monthly mean temperature data for all four meteorological stations.  
16 Temperature trends throughout the year are similar at all four stations. During July and August,  
17 the monthly average temperatures at MFC and KET are higher than at the other two stations,  
18 and the monthly average temperature is always lowest at ID46W (AES, 2010).

19  
20 Table 3-3 tabulates more detailed, long-term data from NCDC for the ID46W (48 years of data)  
21 and ID2ESE (50 years of data) sites. Both stations show monthly average temperatures as  
22 being lowest in January and highest in July.<sup>1</sup> The smallest daily temperature range at both  
23 stations occurs in winter and the largest in summer, due to the more intense solar radiation  
24 experienced in summer. The urban ID2ESE station experiences a smaller daily variation in  
25 temperature than the rural ID46W station. The highest and lowest temperatures recorded at  
26 ID2ESE are 38°C (100°F) and -37°C (-34°F), and are 38°C (101°F) and -44°C (-47°F) at  
27 ID46W (AES, 2010).

### 28 29 **3.5.2.2 Precipitation and Relative Humidity**

#### 30 31 **Precipitation**

32  
33 Air masses approaching the proposed EREF site from the west must cross high mountain  
34 ranges, making the annual precipitation light. Table 3-4 presents normal and extreme  
35 precipitation data collected at the ID2ESE and ID46W monitoring stations. Showers and  
36 thundershowers occur in the summer. Spring and fall precipitation are generally showers or  
37 steady rain. Winter precipitation is usually snow (AES, 2010; NOAA, 2004a,b).

38  
39 Annual average precipitation at ID2ESE is about 361 millimeters (14.2 inches) with a peak in  
40 May. The maximum monthly recorded precipitation is 116 millimeters (4.56 inches) in May  
41 1993. Annual average precipitation at ID46W is less, about 224 millimeters (9 inches). The  
42 maximum monthly recorded precipitation is 118 millimeters (4.64 inches) in June 1995. There  
43 have been at least 10 months with no recorded precipitation in the 30-year period of record.

44  

---

<sup>1</sup> The monthly average temperature is -6.1°C (21.1°F) in January and 20.4°C (68.7°F) in July at  
ID2ESE, and -8.8°C (16.2°F) in January and 19.8°C (67.6°F) in July at ID46W.



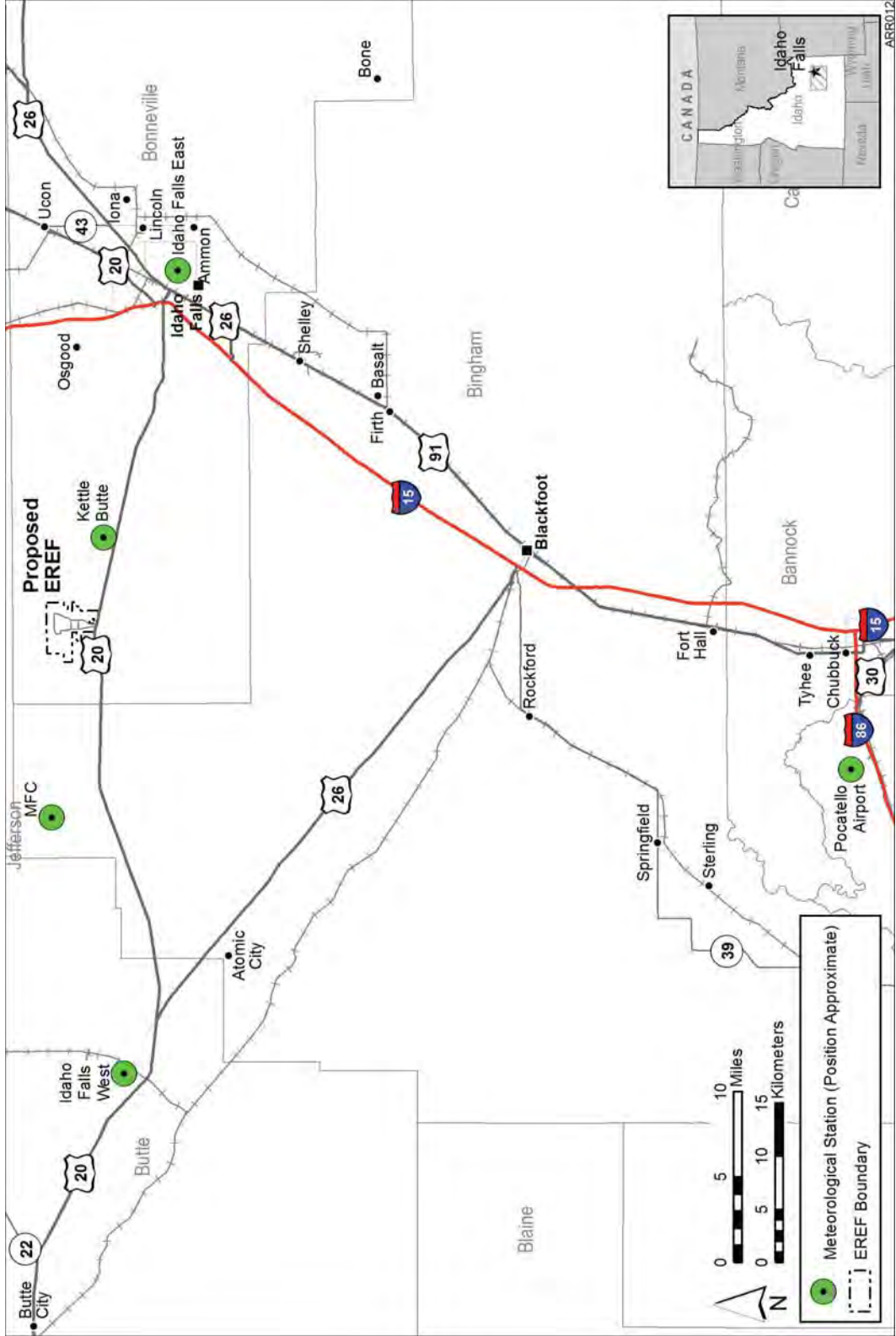
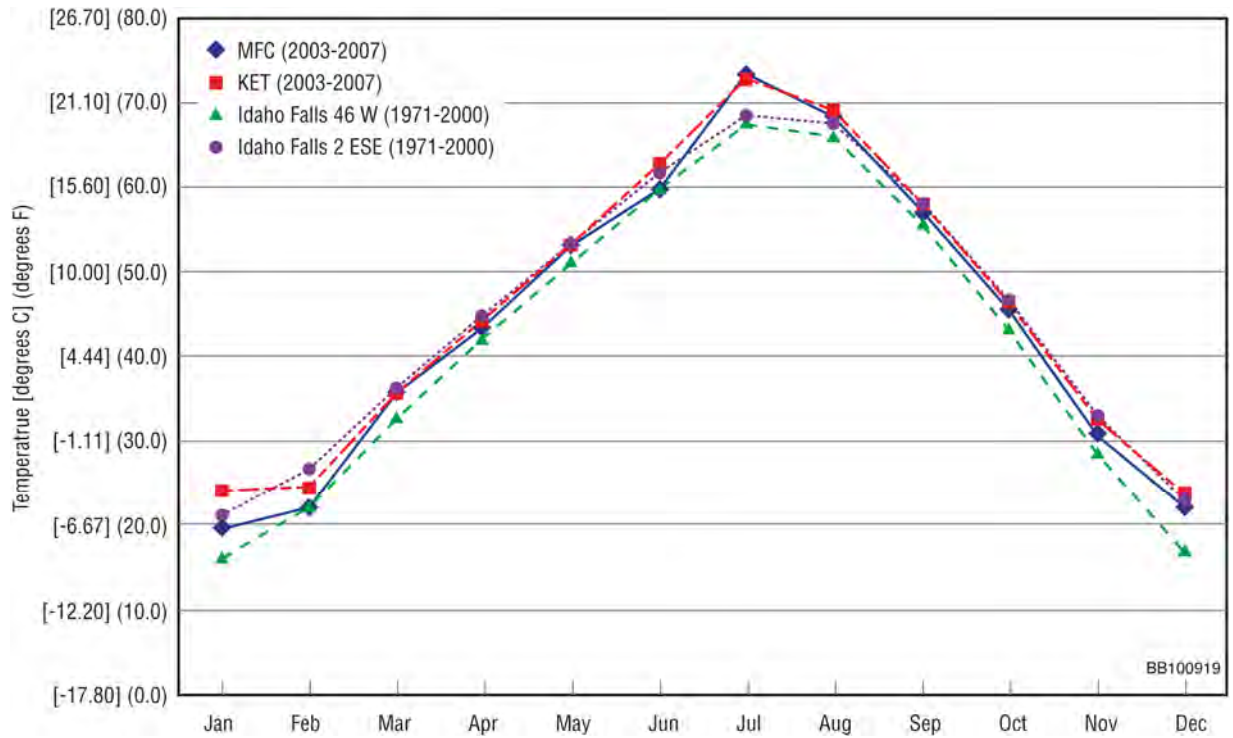


Figure 3-8 Meteorological Monitoring Stations near the Proposed EREF Site



**Figure 3-9 Monthly Mean Temperatures in the Vicinity of the Proposed EREF Site (AES, 2010)**

Figure 3-10 compares monthly mean precipitation at the four nearby stations (the data for MFC and KET are from 2003 to 2007 and are not concurrent with the 1971–2000 record for the other two sites. All four stations have higher precipitation in the spring (April–June) with a second increase in October at MFC and KET. IDESE2 always has the highest precipitation (AES, 2010; NOAA, 2004a,b).

Based on hourly data for KET and MFC for 2003–2007, precipitation occurs only 3 percent of the time and is mostly less than 2.5 millimeters (0.1 inch) (AES, 2010).

Annual average snowfall at ID2ESE is 833 millimeters (32.8 inches) with a highest daily snowfall of 254 millimeters (10 inches) that has occurred at least twice during the 39 years from January 1950 through December 1988. The highest monthly snowfall was 572 millimeters (22.5 inches) in December 1994. Annual average snowfall at ID46W is 637 millimeters (25.1 inches) with a highest daily snowfall of 218 millimeters (8.6 inches). The highest monthly snowfall was 566 millimeters (22.3 inches) in December 1971 (NOAA, 2004a,b).

### **Relative Humidity**

Table 3-5 presents monthly and annual average relative humidity data for ID46W for the period 1956–1961. Relative humidity is higher in the winter and lower in the summer. Values of 100 percent have been observed in all months except July. During the day, the highest relative humidity generally occurs near sunrise, and the lowest in mid-afternoon (Clawson et al., 1989).

**Table 3-3 Mean, Average, and Extreme Temperatures near the Proposed EREF Site**

Station	Temperature <sup>a</sup>	POR <sup>b</sup>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann	
Idaho Falls 2 ESE (ID2ESE)	Extreme highest	1952–2001	55.0	63.0	75.0	85.0	92.0	100.0	100.0	100.0	95.0	87.0	73.0	60.0	100.0	
			12.8	17.2	23.9	29.4	33.3	37.8	37.8	37.8	35.0	30.6	22.8	15.6	37.8	
	Mean maximum	1971–2000	29.7	36.6	47.6	58.7	67.9	77.8	86.0	86.0	85.8	75.1	61.4	43.0	31.3	58.4
			-1.3	2.6	8.7	14.8	19.9	25.4	30.0	30.0	29.9	23.9	16.3	6.1	-0.4	14.7
	Average	1971–2000	21.1	26.7	36.2	45.0	53.3	61.9	68.7	68.7	67.9	58.2	46.8	33.1	22.4	45.1
			-6.1	-2.9	2.3	7.2	11.8	16.6	20.4	19.9	19.9	14.6	8.2	0.6	-5.3	7.3
	Mean minimum	1971–2000	12.5	16.8	24.8	31.3	38.7	46.0	51.4	49.9	41.3	32.2	23.2	13.4	31.8	
			-10.8	-8.4	-4.0	-0.4	3.7	7.8	10.8	10.8	9.9	5.2	0.1	-4.9	-10.3	-0.1
	Extreme lowest	1952–2001	-29.0	-34.0	-15.0	9.0	20.0	28.0	34.0	34.0	31.0	18.0	7.0	-12.0	-29.0	-34.0
			-33.4	-36.7	-26.1	-12.8	-6.7	-2.2	1.1	1.1	-0.6	-7.8	-13.9	-24.4	-33.7	-36.7
Idaho Falls 46 W	Extreme highest	1954–2001	51.0	60.0	73.0	86.0	91.0	100.0	101.0	101.0	96.0	87.0	67.0	57.0	101.0	
			10.6	15.6	22.8	30.0	32.8	37.8	38.3	38.3	35.6	30.6	19.4	13.9	38.3	
	Mean maximum	1971–2000	27.9	34.0	44.8	56.9	66.3	76.8	86.6	86.6	85.7	74.6	60.9	41.4	29.4	57.1 <sup>c</sup>
			-2.3	1.1	7.1	13.8	19.1	24.9	30.3	30.3	29.8	23.7	16.1	5.2	-1.4	13.9
	Average	1971–2000	16.2	22.1	32.8	42.4	51.2	60.0	67.6	67.6	66.2	55.7	43.4	28.7	17.1	42.0
			-8.8	-5.5	0.4	5.8	10.7	15.6	19.8	19.8	19.0	13.2	6.3	-1.8	-8.3	5.6
	Mean minimum	1971–2000	4.5	10.2	20.7	27.9	36.1	43.2	48.5	48.5	46.7	36.8	25.9	15.9	4.8	26.8 <sup>c</sup>
			-15.3	-12.1	-6.3	-2.3	2.3	6.2	9.2	9.2	8.2	2.7	-3.4	-8.9	-15.1	-2.9
	Extreme lowest	1954–2001	-40.0	-36.0	-28.0	6.0	13.0	23.0	28.0	28.0	24.0	12.0	1.0	-24.0	-47.0	-47.0
			-40.0	-37.8	-33.3	-14.4	-10.6	-5.0	-2.2	-2.2	-4.4	-11.1	-17.2	-31.1	-43.9	-43.9

<sup>a</sup> For each temperature, the first line gives the temperature in °F, the second in °C.

<sup>b</sup> POR: Period of Record.

<sup>c</sup> Average of the twelve monthly means.

Source: NOAA, 2004a,b.

**Table 3-4 Monthly Precipitation near the Proposed EREF Site**

Station	Total <sup>a</sup>	POR <sup>b</sup>	Monthly Precipitation												Annual Total		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Idaho Falls 2 ESE	Highest	1952-2001	2.38	3.13	4.30	2.82	4.56	3.16	2.13	2.66	2.81	2.49	3.20	3.18			
			60.45	79.50	109.22	71.63	115.82	80.26	54.10	67.56	71.37	63.25	81.28	80.77			
	Average	1971-2000	1.25	1.01	1.33	1.27	2.01	1.18	0.74	0.93	0.94	1.12	1.17	1.26	14.21		
	Lowest	1952-2001	0.22	0.00	0.04	0.20	0.33	0.15	0.00	0.07	0.00	0.00	0.00	0.00	0.00		
			5.59	0.00	1.02	5.08	8.38	3.81	0.00	1.78	0.00	0.00	0.00	0.00	0.00		
Idaho Falls 46 W	Highest	1954-2001	1.20	2.36	2.03	1.99	2.34	4.64	2.29	1.13	2.08	1.67	1.74	1.91			
			30.48	59.94	51.56	50.55	59.44	117.86	58.17	28.70	52.83	42.42	44.20	48.51			
	Average	1971-2000	0.64	0.62	0.69	0.79	1.24	1.08	0.66	0.44	0.73	0.57	0.69	0.67	8.82		
	Lowest	1954-2001	0.01	0.00	0.00	0.00	0.31	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00		
			0.25	0.00	0.00	0.00	7.87	0.25	0.00	0.51	0.00	0.00	0.00	0.00	0.00		

<sup>a</sup> For each statistic, the first line gives the precipitation in inches, the second in millimeters.

<sup>b</sup> POR: Period of Record.

Source: NOAA, 2004a,b.

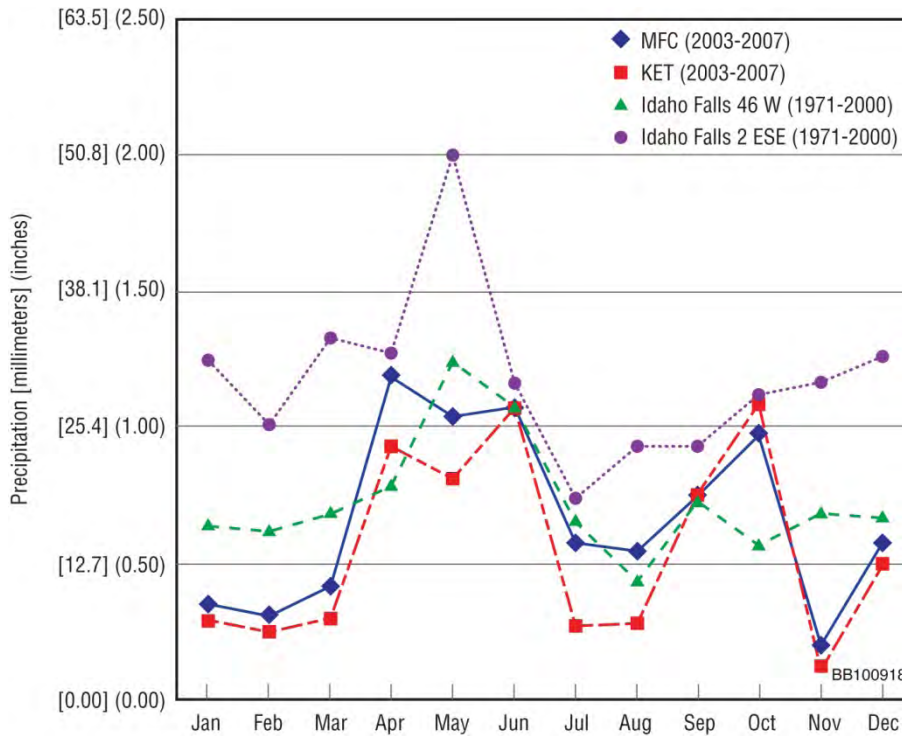


Figure 3-10 Monthly Mean Precipitation in the Vicinity of the Proposed EREF Site (AES, 2010; NOAA, 2004a,b)

### 3.5.2.3 Winds, Atmospheric Stability, and Temperature Inversions

#### Winds

Several phenomena influence the wind patterns at the proposed EREF property. It is in the region of prevailing westerly winds that are channeled by the topography within and surrounding the ESRP to produce predominantly west-southwest or southwesterly winds. Some of the highest wind speeds are observed under these conditions. Drainage winds<sup>2</sup> also affect the wind flow at the proposed EREF site. On clear nights, air near the ground, including mountain slopes, cools rapidly and sinks downslope into the valley floor. On sunny days, an opposite flow develops as the air near the surface heats and rises.

This flow upslope is generally weaker than the downslope flow and is often masked by the channeled prevailing westerlies.

<sup>2</sup> Drainage winds, also sometimes called katabatic winds or fall winds, are winds that carry high-density air masses down the slope of a mountain from higher elevations. The air masses involved are generally cold with low relative humidity and can greatly influence local air circulation patterns.

1 Figure 3-11 presents an annual wind rose<sup>3</sup> for MFC based on  
 2 data for 2004 to 2008. This wind rose clearly shows the  
 3 channeling effect of local topography with winds predominately  
 4 from the southwest and northeast.

5  
 6 Table 3-6 presents average monthly and annual wind speeds  
 7 for ID46W and MFC. The ID46W data were taken at 6 meters  
 8 (20 feet) above the ground, and the MFC data were taken at  
 9 10 meters (33 feet) above the ground. Since wind speed  
 10 changes with height, extensive direct comparisons between  
 11 monitoring stations are problematic. Average wind speeds are  
 12 generally highest in the spring and lowest in winter. The KET  
 13 site which has the highest monitor also has the highest wind  
 14 speeds for each month and for the year. Table 3-7 shows the  
 15 peak winds and the concurrent direction by month. At both  
 16 sites, March is the month with the highest hourly wind speeds  
 17 that range between 41 and 51 miles per hour (18 and  
 18 23 meters per second). The highest hourly winds blow from  
 19 the southwest.

20  
 21 **Atmospheric Stability**

22  
 23 Atmospheric stability plays an important role in dispersing  
 24 atmospheric emissions. Vertical motions and pollution  
 25 dispersion are enhanced in unstable atmospheres and  
 26 suppressed in stable atmospheres. Stability is usually  
 27 classified by the Pasquill-Gifford stability classes ranging from  
 28 A through G, which depend on solar insolation, wind speed, and cloud cover.

29  
 30 A-stability (most unstable) occurs in low winds with high incoming levels of solar radiation  
 31 typically during the daytime. E-stability (slightly stable) and F-stability (moderately stable)  
 32 conditions arise on clear nights with little wind. G-stability (extremely stable) generally occurs  
 33 infrequently with very light winds and clear skies and is often included with F-stability.  
 34 D-stability (neutral) conditions occur with higher wind speeds and/or greater cloud cover  
 35 during both day and night.

36  
 37 Table 3-8 shows the frequency of unstable, neutral, and stable conditions for the station nearest  
 38 the proposed site (Doty et al., 1976). The frequency data are presented as ranges rather than  
 39 as point estimates. The best dispersion (unstable conditions) occurs 16–25 percent of the time,  
 40 and poor dispersion (stable conditions) occurs 26–35 percent of the time.

**Table 3-5 Relative Humidity at ID46W**

Month <sup>a</sup>	Average Relative Humidity (%)
January	68
February	70
March	58
April	44
May	46
June	36
July	30
August	31
September	38
October	48
November	60
December	68
Annual	50

<sup>a</sup> Based on 1956–1961.  
 Source: Clawson et al., 1989.

<sup>3</sup> A *wind rose* summarizes wind speed and direction graphically as a circle displaying series of radial bars pointing in different directions. The direction of a bar shows the direction *from* which the wind blows. Each bar is divided into segments. Each segment represents wind speeds in a given range of speeds; for example, 6–8 meters per second. The length of a given segment represents the percentage of the summarized hours that winds blew from the indicated direction with a speed in the given range.



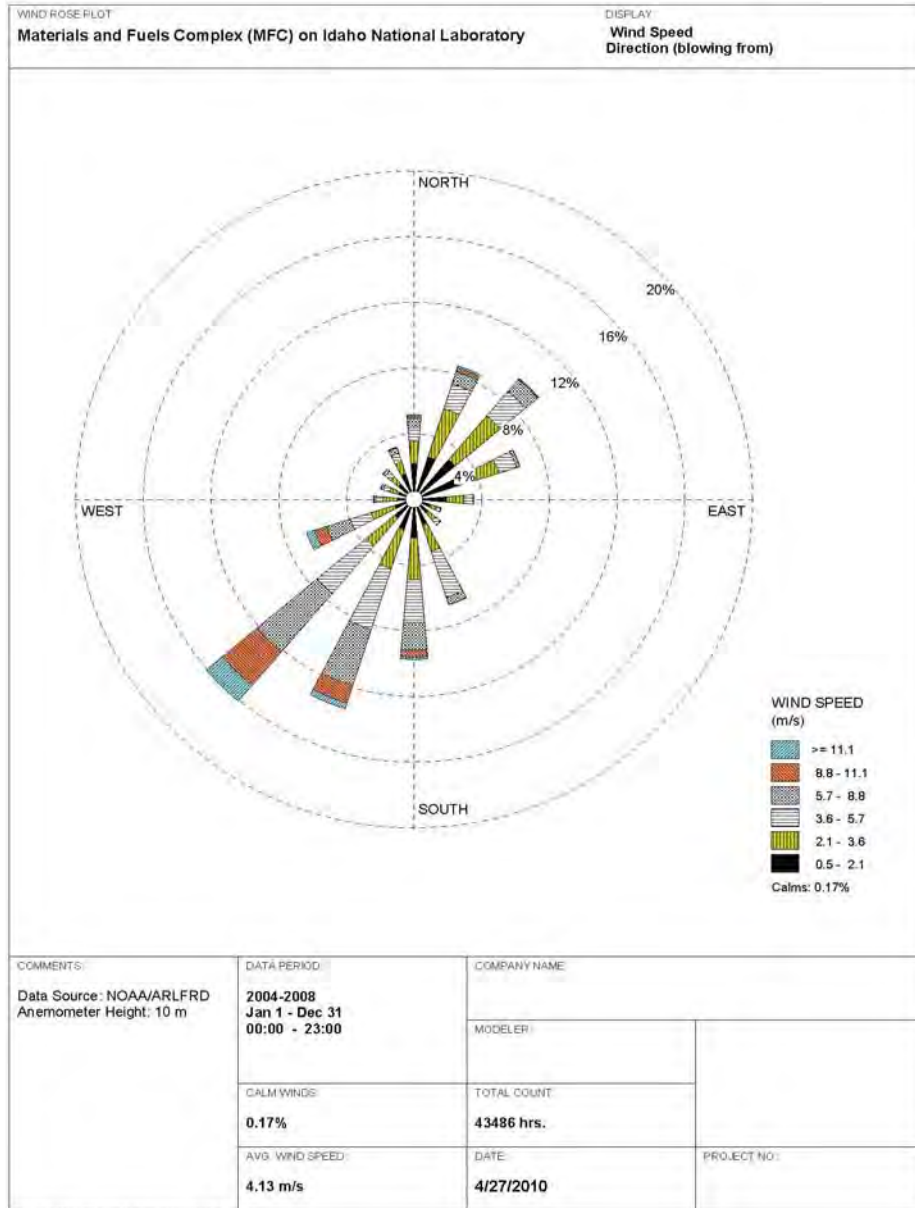


Figure 3-11 Wind Rose for MFC (data from Hukari, 2009)

### Inversions

Normally, the temperature in the atmosphere decreases with altitude. A temperature inversion occurs when there is an increase in temperature of the air mass with increasing elevation above the ground (see Atmospheric Stability text box). Inversions limit vertical dispersion, causing pollutants to be trapped close to the ground. The length of time an inversion lasts (its persistence) is important for determining its impact on dispersion, and thus the ambient air quality in the area impacted by the inversion.

1 Table 3-9 summarizes inversion persistence for the MFC  
 2 site for 1953 to 1960. The longest inversion for the 8-year  
 3 period lasted 66 hours, and every month had at least one  
 4 inversion lasting longer than 13 hours  
 5 (Clawson et al., 1989).  
 6

7 **3.5.2.4 Severe Weather Conditions**

8  
 9 The National Climatic Data Center (NCDC ) storm event  
 10 database tabulates storm events by county (NCDC, 2009b).  
 11 Table 3-10 presents data from this database on various  
 12 storm events in the four-county region comprised of  
 13 Bonneville, Bingham, Butte, and Jefferson Counties. The  
 14 proposed EREF property is entirely within Bonneville  
 15 County but lies at the approximate centroid of these four  
 16 counties. The following paragraphs discuss the most  
 17 frequent storm events and identify additional classes of  
 18 events documented in INL data (Clawson et al., 1989).  
 19 There were no droughts, dust storms, hurricanes, tropical  
 20 storms, waterspouts, or temperature-extreme events  
 21 recorded in the NCDC data.  
 22

23 **Thunderstorms and High Winds**

24  
 25 NCDC (2009b) lists 236 thunderstorms and high wind days,  
 26 or about 4.0 thunderstorms and high wind days per year, as  
 27 having occurred during the period January 1, 1950, through  
 28 December 31, 2008, in the four-county region. There may  
 29 be several thunderstorms during a thunderstorm day.  
 30 Storms can occur throughout the year but are most  
 31 prevalent in the March to October period. Strong winds, hail, and tornadoes can accompany  
 32 severe storms, but thunderstorms tend to be less severe than those east of the Rocky  
 33 Mountains, as the associated precipitation often evaporates before reaching the ground (a  
 34 meteorological phenomenon known as virga). Winds greater than 94 kilometers per hour  
 35 (58 miles per hour) occurred on 147 of the days. Hail accompanied thunderstorms on 8 days.  
 36

37 **Tornadoes**

38  
 39 NCDC (2009b) lists 40 tornadoes during the period in the four-county region, giving an annual  
 40 incidence of 0.68. One F2 tornado<sup>4</sup> was sighted during the period on April 7, 1978. It caused

<sup>4</sup> The Fujita six-point scale (F0 to F5) is used to rate the intensity of a tornado based on the damage it inflicts to structures and vegetation from the lowest intensity, F0, to the highest, F5. Fujitia scale categories are based on estimated (not measured) sustained wind speeds compared against observed structural damage. The enhanced Fujitia scale replaced the original Fujitia scale in February 2007. The enhanced Fujitia scale still uses six categories of tornado intensity (EF0 to EF5) but defines those categories differently. Overall, most tornadoes (around 77 percent) in the United States are EF0 or EF1 and about 95 percent are below EF3 in intensity. Approximately 0.1 percent of all tornadoes each EF5 status with sustained winds in excess of 200 mph (NOAA, 2008). For additional information about the Fujitia scales, see the NOAA Web site at <http://www.spc.noaa.gov/efscale>.

**Table 3-6 Average Monthly and Annual Wind Speeds near the Proposed EREF Site**

Month	Wind Speed [mi/hr (m/sec)]	
	ID46W <sup>a</sup>	MFC <sup>b</sup>
January	5.6 (2.5)	7.2 (3.2)
February	6.9 (3.1)	7.3 (3.2)
March	8.7 (3.9)	9.6 (4.3)
April	9.3 (4.2)	10.9 (4.9)
May	9.3 (4.2)	10.7 (4.8)
June	8.9 (4.0)	10.7 (4.8)
July	8.0 (3.6)	9.8 (4.4)
August	7.7 (3.4)	9.9 (4.4)
September	7.2 (3.2)	9.0 (4.0)
October	6.8 (3.0)	8.5 (3.8)
November	6.4 (2.9)	8.6 (3.9)
December	5.2 (2.3)	8.4 (3.8)
Annual	7.5 (3.4)	9.1 (4.1)

<sup>a</sup> 6-meter (20-foot) level for April 1950 to October 1964.  
<sup>b</sup> 10 meters (33 feet) for 2004 to 2008.  
 Source: ID46W: Clawson et al., 1989;  
 MFC: Hukari, 2009.

**Table 3-7 Highest Hourly Wind Speed and Direction near the Proposed EREF Site**

Month	ID46W <sup>a</sup>		MFC <sup>b</sup>	
	Speed [mi/hr(m/sec)]	Direction	Speed [mi/hr(m/sec)]	Direction
January	48 (21)	WSW	37 (17)	SSW/NNE <sup>c</sup>
February	36 (16)	SW	32 (14)	NNE
March	51 (23)	WSW	41 (18)	SW
April	39 (17)	WSW	11 (17)	SW
May	41 (18)	SW	34 (15)	SW
June	36 (16)	SW	35 (16)	SW
July	35 (16)	WSW	38 (17)	SW
August	40 (18)	WSW	36 (16)	SW
September	42 (19)	WSW	30 (13)	SSW
October	44 (20)	WSW	33 (15)	SSW
November	40 (18)	WSW	35 (16)	SW
December	43 (19)	SW	39 (17)	SSW
Annual	51 (23)	WSW	41 (18)	SW

<sup>a</sup> 6-meter (20-foot) level for April 1950 to October 1964.

<sup>b</sup> 10 meters (33 feet) for 2004 to 2008.

<sup>c</sup> Almost equal number of hours in both directions.

Source: ID46W: Clawson et al., 1989; MFC: Hukari, 2009.

**Table 3-8 Stability Class Distribution near the Proposed Site**

Stability	Frequency (%)
Unstable	16–25
Neutral	56–65
Stable	26–35

Source: Doty et al., 1976.

1  
2 \$2.5 million in damage and one injury. Twenty of the tornadoes  
3 were F1 in strength; the remainder were F0.

4  
5 In addition to tornadoes, 12 funnel clouds, violent atmospheric  
6 vortices that do not reach the ground, were sighted during the  
7 period in the four-county region.

8  
9 **Airborne Dust and Sand**

10  
11 NCDC (2009b) lists no dust storms during the period in the  
12 four-county region. However, since the proposed EREF site is in  
13 a semiarid area, blowing and drifting dust could be a nuisance  
14 when winds are strong. Vehicles and construction equipment could also contribute to airborne  
15 dust.  
16

**Table 3-9 Inversion Persistence at MFC<sup>a</sup>**

Month	Average Hours per Day	Max Hours per Day	Longest Duration (hr)
January	17.0	24	46
February	15.7	23	24
March	13.5	18	20
April	11.8	14	14
May	10.8	15	13
June	10.2	13	15
July	10.7	15	15
August	11.7	14	14
September	12.8	15	18
October	14.3	17	17
November	15.1	21	21
December	16.8	24	66

<sup>a</sup> Based on January 1953 to December 1960.  
Source: Clawson et al., 1989.

1

**Table 3-10 Storm Events in the Vicinity of the Proposed EREF Site**

County	Type and Number of Storm Event <sup>a,b</sup>								
	Thunderstorms and High Winds	Tornados	Precipitation <sup>c</sup>	Snow and Ice <sup>d</sup>	Lightning	Funnel Cloud	Flood	Hail	Fog
Bonneville	48 (5)	5 (4)	6	4	4	4	3	22	1
Bingham	87 (20)	15 (8)	4	0	5	5	5	28	1
Butte	52 (1)	7 (2)	0	0	0	3	1	23	0
Jefferson	49 (3)	13 (9)	0	0	0	0	0	19	0
Total	236 (29)	40 (23)	10	4	9	12	9	92	2

<sup>a</sup> Period of Record: January 1, 1950, to May 31, 2009.

<sup>b</sup> Numbers in parentheses are number of events associated with property damage.

<sup>c</sup> All events were heavy rains.

<sup>d</sup> All events were snow.

Source: NCDC, 2009b.

2  
3

1 **Dust Devils**

2  
3 Dust devils are small rotating updrafts over hot land surfaces. Dust devils are common in the  
4 summer at the proposed EREF site when intense solar heating of the ground makes dust devil  
5 formation possible. Because of their relatively weak wind speeds and short duration, they rarely  
6 damage people or property (Clawson et al., 1989).  
7

8 **Blowing Snow**

9  
10 Blowing snow occurs when snow is picked up from the ground and entrained in the air by high  
11 winds. Blowing snow can reduce visibility and accumulate into drifts on the downwind side of  
12 buildings and other obstacles. The flat terrain around the proposed EREF is not conducive to  
13 the formation of snowdrifts. However, at INL to the immediate west, drifts may occasionally  
14 render parking lots and roads impassable and cause traffic to be rerouted  
15 (Clawson et al., 1989).  
16

17 **Floods**

18  
19 Of the nine listed flood events listed in NCDC (2009b), one was an urban event, one was a  
20 small stream event, three were combined urban/small stream events, and four were flash flood  
21 events.  
22

23 **Lightning**

24  
25 Lightning strikes can cause injury, death, and property damage. Of the nine events listed in  
26 NCDC (2009b) for the four-county region, none caused injury or death and five resulted in  
27 property damage. NOAA (2009) gives a lightning strike density for this area of 0.1 to 1 per  
28 square kilometer per year, a value at the lower end of the strike density range. The analysis  
29 presented in AES (2010) uses a more conservative density of one flash per square kilometer  
30 per year to estimate a lightning strike frequency of 0.75 flashes per square kilometer per year  
31 for the proposed EREF industrial complex (including the Cylinder Storage Pad).  
32

33 **3.5.2.5 Mixing Heights**

34  
35 The mixing height is defined as the height above the surface through which relatively vigorous  
36 vertical mixing occurs, primarily through the action of atmospheric turbulence. When the mixing  
37 height is low (i.e., very little vertical motion), ground-level pollutant concentrations will be  
38 relatively high because the pollutants are prevented from dispersing upward. Mixing heights  
39 commonly go through large diurnal variations due to solar heating and surface cooling. Mixing  
40 heights are generally lowest late at night or early in the morning and highest during mid to late  
41 afternoon. Afternoon mixing heights display a large seasonal variation, and mixing heights in  
42 summer are typically higher than those in winter.  
43

44 Table 3-11 presents seasonal and annual mixing heights estimated at INL  
45 (Clawson et al., 1989). The mixing height is greatest on summer afternoons and least on  
46 summer mornings. The average annual mixing height is 370 meters (1210 feet) in the morning  
47 and 2090 meters (6860 feet) in the summer.  
48  
49

1 **3.5.3 Air Quality**

2  
3 There are several U.S. Environmental Protection Agency  
4 (EPA) programs authorized by the *Clean Air Act* and its  
5 amendments that define the regulatory environment for air  
6 emission sources at the proposed EREF property. The  
7 Idaho Department of Environmental Quality (IDEQ) has  
8 authority to administer these programs in the State. The  
9 major programs are summarized below.

10  
11 EPA's National Ambient Air Quality Standards (NAAQS)  
12 set maximum levels of air pollutants in the ambient air  
13 deemed to provide protection for human health and  
14 welfare. Areas where these standards are not being met  
15 are designated as nonattainment areas. When a  
16 nonattainment area attains the standard, it becomes a  
17 maintenance area. States must develop Federally  
18 approved plans specifying how the NAAQS will be attained  
19 and maintained. NAAQS are shown in Table 3-12.

20  
21 Sulfur dioxide (SO<sub>2</sub>) is a gas emitted largely by stationary internal or external combustion  
22 sources burning fossil fuels. Particulate matter (PM) includes solid matter and liquid droplets in  
23 the atmosphere. Particles with aerodynamic diameters below 10 micrometers (1 micrometer is  
24 about 0.000039 inch) constitute PM<sub>10</sub>. Smaller particles with diameters below 2.5 micrometers  
25 constitute PM<sub>2.5</sub>. Carbon monoxide (CO) is a gas produced primarily by the incomplete  
26 combustion of carbon in fuels; vehicles and stationary internal combustion engines emit most of  
27 the carbon monoxide. Nitrogen dioxide (NO<sub>2</sub>) is a gas formed primarily when using fuels  
28 containing nitrogen, or when the temperatures of combustion are high enough to thermally  
29 degrade the otherwise inert nitrogen molecules in the stream of ambient air used to support the  
30 combustion. In the presence of sunlight, NO<sub>2</sub> reacts with volatile organic compounds (VOCs) in  
31 the atmosphere to produce ozone (O<sub>3</sub>). Lead is a metal that can be emitted by some stationary  
32 combustion sources (as the stable oxide).<sup>5</sup>

33  
34 In areas with pollutant levels below the NAAQS, the Prevention of Significant Deterioration  
35 (PSD) Program (40 CFR 52.21) places limits on the total allowable increases in ambient  
36 pollutant levels above established baseline levels for SO<sub>2</sub>, NO<sub>2</sub>, and PM<sub>10</sub>. This prohibits  
37 "polluting up to the limits" specified in the NAAQS for these pollutants. Under these regulations,  
38 the allowable increases are smallest in Class I areas (e.g., national parks and wilderness areas)  
39 where the air quality value of visibility must be preserved. The rest of the country is subject to  
40 larger Class II increments.

41  

---

<sup>5</sup> Until 1976, a major source of lead in the atmosphere resulted from the combustion of leaded gasoline. Tetraethyl lead was used as an anti-knock and octane-boosting gasoline additive between the years 1930 and 1976.

**Table 3-11 Estimated Seasonal and Annual Mixing Heights in the Vicinity of the Proposed EREF Site**

Season	Estimated EREF Average Mixing Heights [m (ft)]	
	Morning	Afternoon
Spring	480 (1600)	2330 (7640)
Summer	260 (850)	2900 (9510)
Autumn	330 (1100)	1550 (5100)
Winter	400 (1300)	730 (2400)
Annual	370 (1210)	2090 (6860)

Source: Clawson et al., 1989.



**Table 3-12 National Ambient Air Quality Standards<sup>a</sup>**

<b>Pollutant<sup>b</sup></b>	<b>Averaging Time</b>	<b>Standard Value</b>		<b>Standard Type<sup>c</sup></b>
SO <sub>2</sub>	3 h	0.5 ppm	(1300 µg/m <sup>3</sup> )	S
	24 h	0.14 ppm	(365 µg/m <sup>3</sup> )	P
	Annual arithmetic mean	0.030 ppm	(80 µg/m <sup>3</sup> )	P
NO <sub>2</sub>	Annual arithmetic mean	0.053 ppm	(100 µg/m <sup>3</sup> )	P, S
CO	1 h	35 ppm	(40 mg/m <sup>3</sup> )	P
	8 h	9 ppm	(10 mg/m <sup>3</sup> )	P
O <sub>3</sub>	1 h	0.12 ppm <sup>d</sup>	(235 µg/m <sup>3</sup> )	P, S
	8 h	0.075 ppm	(157 µg/m <sup>3</sup> )	P, S
PM <sub>10</sub>	24 h	150 µg/m <sup>3</sup>		P, S
PM <sub>2.5</sub>	24 h	35 µg/m <sup>3e</sup>		P, S
	Annual	15.0 µg/m <sup>3</sup>		P, S
Lead	Calendar quarter <sup>f</sup>	1.5 µg/m <sup>3</sup>		P, S

<sup>a</sup> Refer to 40 CFR Part 50 for detailed information on attainment determination and reference method for monitoring (refer to <http://www.gpoaccess.gov/cfr/index.html>).

<sup>b</sup> CO = carbon monoxide; NO<sub>2</sub> = nitrogen dioxide; O<sub>3</sub> = ozone; PM<sub>2.5</sub> = particulate matter ≤ 2.5 µm; PM<sub>10</sub> = particulate matter ≤ 10 µm; and SO<sub>2</sub> = sulfur dioxide.

<sup>c</sup> P = primary standards, which set limits to protect public health; S = secondary standards, which set limits to protect welfare and quality of life.

<sup>d</sup> On June 15, 2005, the 1-hour O<sub>3</sub> standard was revoked for all areas except the 8-hour O<sub>3</sub> nonattainment Early Action Compact areas (those do not yet have an effective date for their 8-hour designations). The 1-hour standard will be revoked for these areas 1 year after the effective date of their designation as attainment or nonattainment for the 8-hour O<sub>3</sub> standard.

<sup>e</sup> Effective December 17, 2006, EPA revoked the annual PM<sub>10</sub> standard of the current 50 µg/m<sup>3</sup> and revised the 24-hour PM<sub>2.5</sub> standard from 65 µg/m<sup>3</sup> to 35 µg/m<sup>3</sup>.

<sup>f</sup> On October 15, 2008, the EPA revised the lead standard from a calendar-quarter average of 1.5 µg/m<sup>3</sup> to a rolling 3-month average of 0.15 µg/m<sup>3</sup>.

Source: 40 CFR Part 50; 40 CFR 52.21 (for PSD).

1  
2

1 Idaho has promulgated State Ambient Air Quality Standards (SAAQS) under analogous State  
2 authority (see *Idaho Administrative Procedures Act* [IDAPA] 58.01.01.577).<sup>6</sup> Standards for SO<sub>2</sub>,  
3 NO<sub>2</sub>, CO, 1-hour O<sub>3</sub>, PM<sub>10</sub>, and lead are substantively identical to the NAAQS. However, Idaho  
4 has not established standards for 8-hour O<sub>3</sub> or PM<sub>2.5</sub>. The State has also adopted standards for  
5 fluorides.<sup>7</sup> EPA has granted IDEQ authority to implement the Federal program.  
6

7 Section 112 of the *Clean Air Act* specifies a list of 188 air toxics. EPA has issued National  
8 Emission Standards for Hazardous Air Pollutants (NESHAP) requiring control of sources of  
9 these pollutants. These standards are based on an emission control technology, rather than  
10 being derived from a health-based approach; but an assessment of the health risk remaining  
11 after the emission controls are in place is still required.  
12

### 13 **3.5.3.1 Regional Air Quality**

14  
15 IDEQ (2007a) summarizes Idaho ambient air monitoring data through 2007: most areas of the  
16 State are well within the NAAQS. Isolated areas are nonattainment for PM<sub>10</sub> and are areas of  
17 concern for PM<sub>2.5</sub>. One area in the far western part of the State is a maintenance area for CO  
18 and PM<sub>10</sub>. The locations of the above noted areas, as well as the Class I areas, are shown on  
19 Figure 3-12.  
20

21 Ambient air quality data for Bonneville County for calendar year 2008 include the following: CO,  
22 35 ppm (1-hour average), 9 ppm (8-hour average); NO<sub>2</sub>, 0.053 ppm (annual mean).  
23

### 24 **3.5.3.2 Criteria Pollutant Emissions**

25  
26 Table 3-13 presents 2005 emissions of criteria pollutants from the four counties including and  
27 surrounding the proposed EREF site (Bingham, Bonneville, Butte, and Jefferson) (IDEQ, 2009).  
28 Emissions of all pollutants are dominated by nonpoint and mobile sources. There were  
29 11 facilities in the point emissions inventory in Bingham, Butte, and Jefferson Counties. (These  
30 are traditional stationary sources rather than mobile or area source like wind-blown dust.) Eight  
31 were associated with activities at INL located in Bingham, Butte, and Jefferson Counties, and  
32 the other three were food processing facilities.  
33

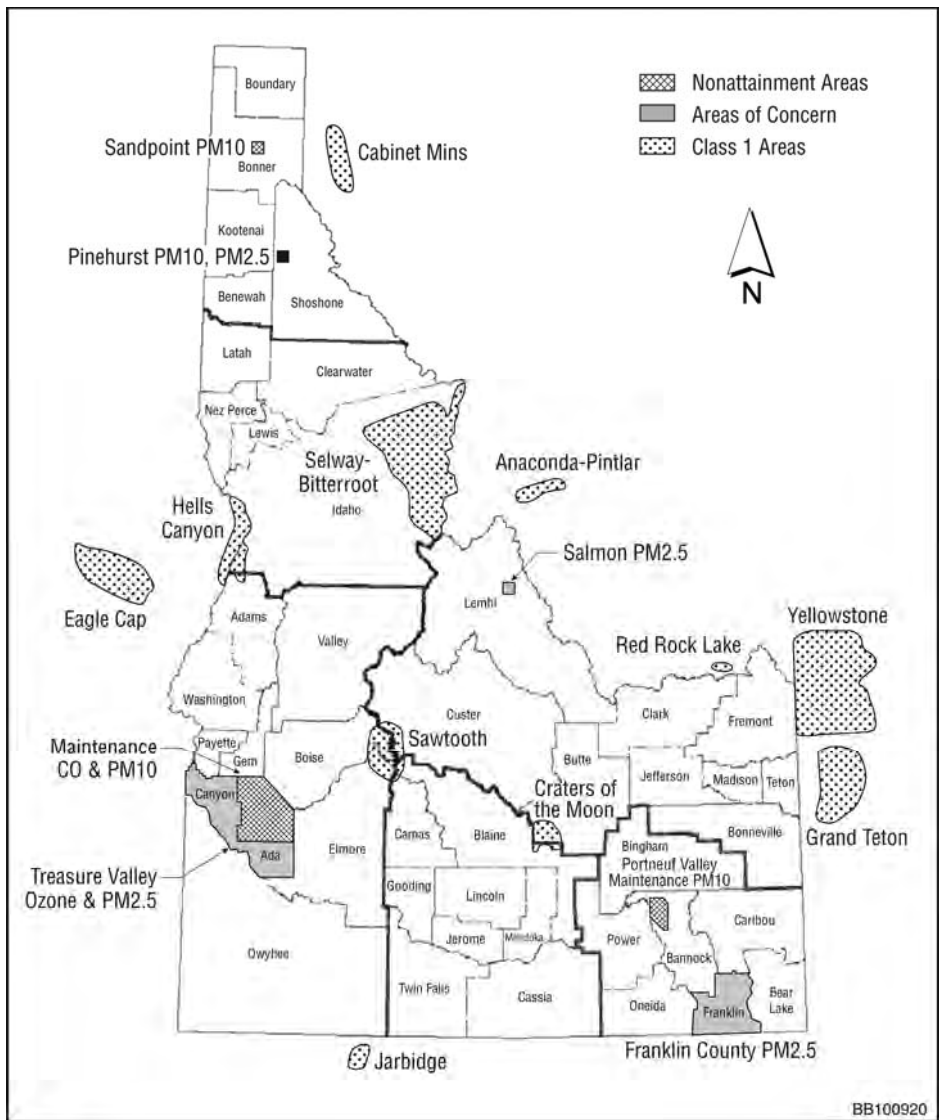
34 Table 3-14 presents 2005 emissions of air toxics in excess 9.1 metric tons per year  
35 (i.e., >10 tons per year) from the four counties surrounding the proposed EREF. (Single  
36 sources emitting 10 tons per year or more of an air toxic are defined as major and are subject to  
37 more stringent emission limits than smaller sources.) Other inventoried air toxics were emitted  
38 in lesser amounts.  
39

40 Idaho does not require sources to report emissions of greenhouse gases. In response to the  
41 *Consolidated Appropriations Action of 2008* (Public Law 110-161), EPA promulgated final  
42 mandatory greenhouse gas reporting regulations on October 30, 2009, that became effective in  
43 December 2009 (EPA, 2009a). The rules are applicable to major sources of CO<sub>2</sub>, defined as

---

<sup>6</sup> Idaho regulations, "Rules for the Control of Air Pollution in Idaho," can be accessed at [http://www.deq.idaho.gov/air/data\\_reports/monitoring/overview.cfm](http://www.deq.idaho.gov/air/data_reports/monitoring/overview.cfm).

<sup>7</sup> There is no Federal standard for fluorides. Idaho SAAQS for fluoride include 80 ppm monthly, 60 ppm bimonthly, and 40 ppm annual arithmetic mean. See IDAPA 58.01.01.577.06.



1

2 **Figure 3-12 Idaho Air Quality Planning Areas (IDEQ, 2007b; Richards, 2009a,b)**

3

**Table 3-13 Emissions from the Four Counties  
Closest to the Proposed EREF Site<sup>a</sup>**

2005 Annual Emissions [10 <sup>3</sup> metric tons/yr (10 <sup>3</sup> tons/yr)]					
PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC
69 (76)	0.58 (0.64)	1.3 (1.4)	7.1 (7.8)	65 (72)	12 (13)

<sup>a</sup> Bingham, Bonneville, Butte, and Jefferson Counties.  
Source: IDEQ, 2009.

4

**Table 3-14 Air Toxics Emissions from the Four Counties Closest to the Proposed EREF Site<sup>a,b</sup>**

<b>Pollutant</b>	<b>2005 Annual Emissions [metric tons/yr (tons/yr)]</b>
Formaldehyde	220 (240)
Methanol	56 (62)
Benzene	200 (220)
Methyl bromide	44 (49)
Chloromethane	1000 (1100)
Hydrogen cyanide	12 (14)
Acetaldehyde	110 (120)
Methyl ethyl ketone	17 (18)
Trichloroethylene	210 (231)
2,4-D	25 (28)
Styrene	14 (15)
1,3-Butadiene	38 (42)
Acrolein	49 (54)
Methyl isobutyl ketone	40 (44)
Toluene	170 (190)
Chlorobenzene	10 (11)
Hexane	53 (58)
Tetrachloroethylene	53 (58)
Carbonyl sulfide	27 (30)
1,3-Dichloropropene	160 (180)
Xylene (mixed isomers)	57 (63)
Trifluralin	9.5 (10)
Hydrochloric acid	11 (12)
Hydrofluoric acid	28 (31)
Chlorine	11 (12)

<sup>a</sup> Bingham, Bonneville, Butte, and Jefferson Counties.

<sup>b</sup> Only pollutants with total emissions above 9 metric tons/yr (10 tons/yr) are listed.

Source: IDEQ, 2009.

1 those emitting more than 25,000 tons per year, and require annual reporting of greenhouse gas  
2 emissions directly to EPA.

### 3 4 **3.5.3.3 Nonattainment and Maintenance Areas**

5  
6 Information in the section was compiled from IDEQ (2007a,b) and Richards (2009a,b). The  
7 areas discussed are shown in Figure 3-12.

8  
9 The proposed EREF site is not located in, or in close proximity to, a nonattainment or  
10 maintenance area for any NAAQS.

11  
12 There are no nonattainment or maintenance areas for lead, sulfur dioxide, or nitrogen dioxide.

13  
14 Idaho is in attainment for CO, while a portion of Ada County remains a maintenance area.

15  
16 The areas of Sandpoint and Pinehurst in far northern Idaho present PM issues. Idaho will  
17 submit a maintenance plan to EPA for Sandhurst this year. Pinehurst remains nonattainment  
18 for PM<sub>10</sub>. A portion of Ada County and Bannock County (the Portneuf Valley) are maintenance  
19 areas for PM<sub>10</sub>. Portneuf Valley, the closest nonattainment or maintenance area to the  
20 proposed EREF site, is located about 56 kilometers (35 miles) south. The Fort Hall area in  
21 Power County next to the Portneuf Valley is also designated as nonattainment for PM<sub>10</sub>.

22  
23 All of Idaho was designated attainment/unclassifiable for PM<sub>2.5</sub> in 2007. The State will probably  
24 recommend that EPA designate Pinehurst County and a portion of Franklin County as  
25 nonattainment for PM<sub>2.5</sub> (IDEQ, undated).

26  
27 There are no nonattainment or maintenance areas for ozone in Idaho. However, Treasure  
28 Valley is close to the new standard and may go into nonattainment when the 2008 monitoring  
29 data are analyzed.

30  
31 The U.S. Department of Energy (DOE) conducts ambient air monitoring for PM<sub>10</sub> and NO<sub>2</sub> at  
32 various locations within and surrounding its INL, which is located proximate to the proposed  
33 EREF site (DOE, 2005).<sup>8</sup> PM<sub>10</sub> monitoring is performed at the INL site boundary and in the  
34 surrounding communities of Rexburg, Blackfoot, and Atomic City. In 2003, 60 samples  
35 collected at Rexburg ranged from 0.42 to 153.9 micrograms per cubic meter, 60 samples  
36 collected at Blackfoot ranged from 1.3 to 173.7 micrograms per cubic meter, and 59 samples  
37 collected at Atomic City ranged from 0.7 to 73.0 micrograms per cubic meter. NO<sub>2</sub> monitoring is  
38 performed at two locations on INL. In 2003, both locations showed NO<sub>2</sub> levels well below the  
39 ambient standard of 0.053 ppm (53 parts per billion [ppb]). Quarterly mean concentrations at  
40 the first location ranged from 2.9 to 3.9 ppb with an annual mean of 3.5 ppb. Quarterly mean  
41 values at the second monitoring station ranged from 7.4 to 10.7 ppb with a mean annual  
42 concentration of 9.1 ppb (based on two quarters of data).

43  

---

<sup>8</sup> The INL monitoring sites are used to measure INL's impact on its local environment and to demonstrate INL's compliance with applicable regulations, DOE orders, standards, and permit conditions. They are not part of the official monitoring network maintained by the State of Idaho with which conformance to NAAQS is demonstrated and ambient air quality status is established.

1 In 2006, the last year for which full yearly data are available,<sup>9</sup> PM<sub>10</sub> 24-hour samples collected  
2 at the above three monitoring stations showed the following concentration ranges: Rexburg,  
3 0.0–44.8 micrograms per cubic meter; Blackfoot, 0.3–50.1 micrograms per cubic meter; and  
4 Atomic City, 0.0–66.1 micrograms per cubic meter (DOE, 2007). These data indicate that the  
5 counties surrounding the proposed EREF site were in attainment with all NAAQS over the  
6 period the monitoring was performed.

#### 7 8 **3.5.3.4 Prevention of Significant Deterioration (PSD)**

9  
10 Figure 3-12 shows the Class I areas in and around Idaho. These areas are of special concern  
11 because of the small air quality increments that apply in them and because sources impacting  
12 them may need to consider visibility impacts and “air quality-related values.” The following are  
13 the closest Class I areas to the proposed EREF site (NPS, 2007):

- 14 • Craters of the Moon National Monument and Preserve, about 75 kilometers (47 miles) to the  
15 west;
- 16 • Red Rock Lakes National Wildlife Refuge, about 95 kilometers (59 miles) to the north-  
17 northeast;
- 18 • Yellowstone National Park, about 105 kilometers (65 miles) to the northeast; and  
19
- 20 • Grand Teton National Park, about 105 kilometers (65 miles) to the east.  
21

22  
23 All areas are Class II unless they are one of the listed Class I areas; no areas have requested  
24 redesignation to Class III. The proposed EREF site is not one of these Class I areas and  
25 retains the PSD Class II designation.  
26  
27

#### 28 29 **3.5.3.5 Conformity**

30  
31 Actions involving major Federal involvement may need to demonstrate that they conform to the  
32 State’s implementation plan. Conformity applies only if the action will take place in a  
33 nonattainment or maintenance area. Since the proposed EREF site is not in such an area,  
34 conformity would not apply.  
35

### 36 **3.6 Geology, Minerals, and Soils**

37  
38 This section describes the regional and local geology and identifies the characteristics of the  
39 soil, mineral, and energy resources at the proposed EREF site. While the NRC staff’s process  
40 for reviewing the license application includes an examination of the applicant’s seismic and  
41 volcanic hazards assessment and the structural design of the proposed EREF, the discussion of  
42 geology in this section is not intended to support a detailed safety analysis. The NRC staff  
43 documented its analysis of seismic and volcanic hazards in its Safety Evaluation Report (SER)  
44 (NRC, 2010).  
45

---

<sup>9</sup> PM<sub>10</sub> monitoring was discontinued at these three locations in March 2007 because the results were no longer required to demonstrate INL compliance.



1 Figure 3-13 shows a geologic time scale to depict when different geologic units formed, as  
2 described in the following sections.

### 3 4 **3.6.1 Regional Geology**

5  
6 The proposed EREF site is located on the East Snake River Plain (ESRP), within the ESRP  
7 physiographic province (Figure 3-14). The ESRP is an east-northeast trending 600-kilometer  
8 (373-mile)-long and 100-kilometer (62-mile)-wide topographic depression extending from Twin  
9 Falls to Ashton, Idaho. The predominant physiographic features of the ESRP province are  
10 Quaternary-age volcanic landforms: basaltic lava flows, shield volcanoes, and rhyolitic domes.  
11 These landforms, along with other eruptive features (e.g., dikes and pyroclastic domes), are  
12 concentrated along a northeast-trending axial volcanic zone. That zone constitutes the  
13 topographically high central axis of the ESRP. The ESRP is bounded on the north and south by  
14 the north-to-northwest trending mountains of the northern Basin and Range physiographic  
15 province. The mountain peaks, reaching heights of 3660 meters (12,000 feet), are separated by  
16 basins filled with terrestrial sediments and volcanic rocks. The basins are 5 to 20 kilometers  
17 (3 to 12 miles) wide and grade onto the ESRP. The Yellowstone Plateau lies to the northeast of  
18 the ESRP (Hughes et al., 1999; DOE, 2005).

19  
20 The upper 1 to 2 kilometers (0.62 to 1.2 miles) of the ESRP is composed of numerous basaltic  
21 lava flows with intercalated sediment. Several volcanic rift zones, each with a northwestern  
22 trend, cut across the ESRP and have been identified as the source areas for these lava flows  
23 (Figure 3-15). The volcanic rift zone orientations are the result of basalt dikes that intruded  
24 perpendicular to the northeast-southwest direction of crustal extension associated with the  
25 Basin and Range province, located to the north and south of the ESRP. Widespread basaltic  
26 volcanic activity occurred intermittently on the ESRP throughout the Pleistocene and Holocene.  
27 The most recent episode of basaltic volcanism occurred about 2000 years ago in the Great Rift  
28 volcanic rift zone to the west. Volcanism on the ESRP is a result of the movement of the North  
29 American tectonic plate southwestwardly over the Yellowstone mantle plume or hotspot  
30 (Hughes et al., 1999; DOE, 2005; Anderson et al., 1996; Smith, 2004).

31  
32 Figure 3-16 shows the stratigraphy of the ESRP in the vicinity of the proposed EREF site. The  
33 ESRP is underlain by Quaternary and Tertiary age basaltic lava interbedded with poorly  
34 consolidated sedimentary materials to depths of 2 kilometers (1.2 miles). The thickness of most  
35 individual basalt flows in the upper part of the section ranges from 5 to 25 meters (16 to 82 feet),  
36 and their lengths extend up to 48 kilometers (30 miles). Sediments consist of materials  
37 deposited by streams (silts, sands, and gravels), lakes (clays, silts, and sands), and wind (silts  
38 and sands) that accumulated on the ESRP between volcanic events. During long periods of  
39 inactivity, sediments accumulated to thicknesses greater than 60 meters (197 feet). These  
40 interbedded sequences are collectively known as the Snake River Group. Underlying the  
41 Snake River Group is a thick sequence of Tertiary rhyolitic (silicic volcanic) rocks that erupted  
42 when the area was over the Yellowstone hotspot, more than 4 million years ago. The last 4  
43 million years have been a period of crustal subsidence within the ESRP as it isostatically adjusts  
44 to the mass of dense mantle-derived basalt (gabbro) that now comprises the middle crust.  
45 Because temperatures in the upper mantle below the ESRP remain relatively high, partial  
46 melting of mantle material continues to produce basaltic magmas that rise to the surface and  
47 erupt as lavas that fill the subsiding basin (Hughes et al., 1999; DOE, 2005;  
48 Ackerman et al., 2006; Smith, 2004).

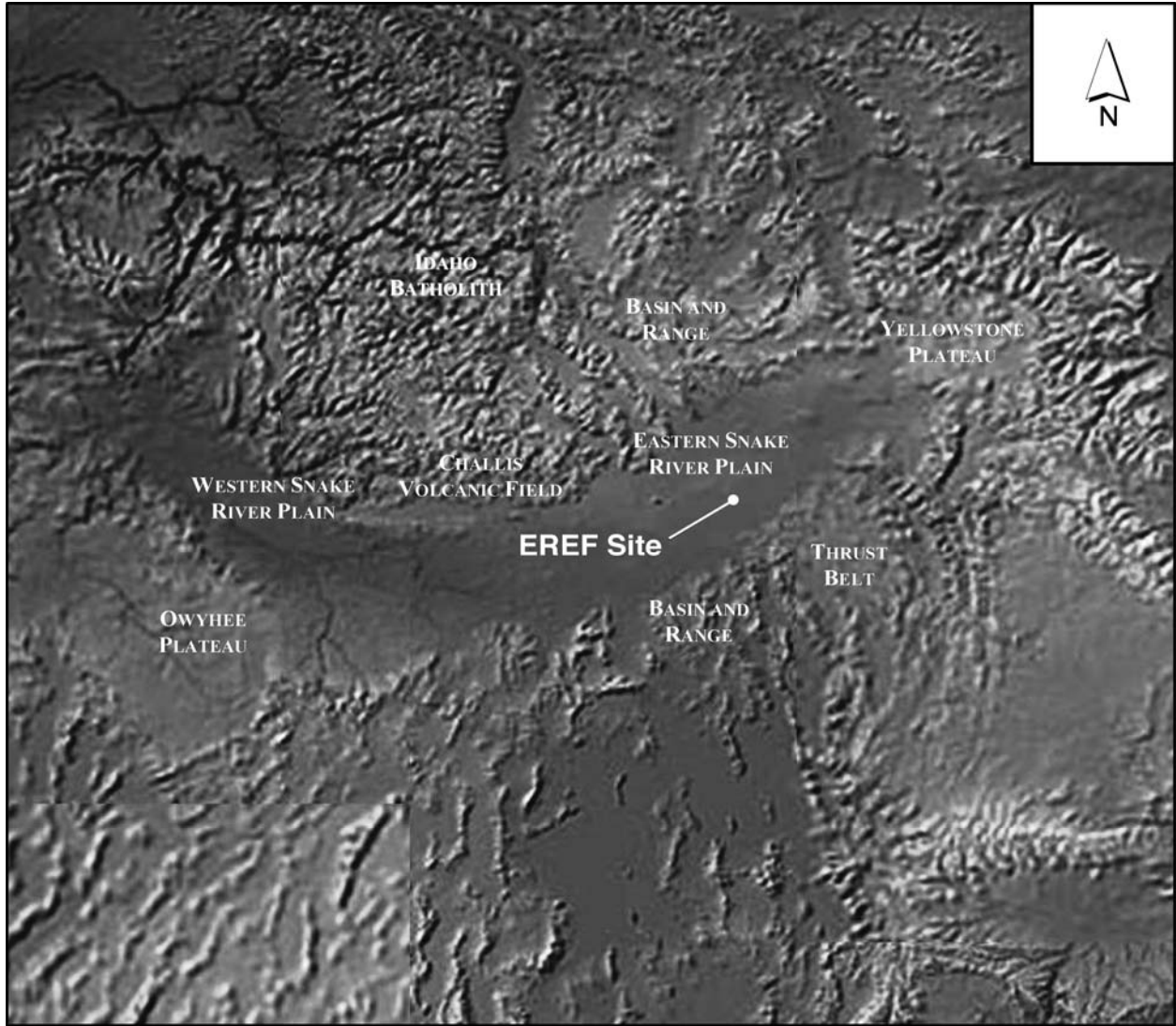
Eon	Era	Period	Epoch	Age in Millions of Years	
Phanerozoic	Cenozoic	Quaternary	Holocene	Present	
			Pleistocene	0.01	
		Tertiary	Neogene	Pliocene	1.6
				Miocene	5.3
				Oligocene	23.7
			Paleogene	Eocene	36.6
				Paleocene	57.8
					66.4
		Mesozoic	Cretaceous		144
			Jurassic		208
	Triassic			245	
	Paleozoic	Carboniferous	Permian	286	
			Pennsylvanian	320	
		Mississippian	360		
		Devonian	408		
		Silurian	438		
		Ordovician	505		
		Cambrian	570		
	Precambrian	Proterozoic		2500	
Archean		3800			
Hadean		4550			

Figure 3-13 Geologic Time Scale (USGS, 2009a)

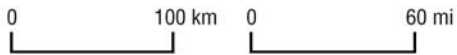
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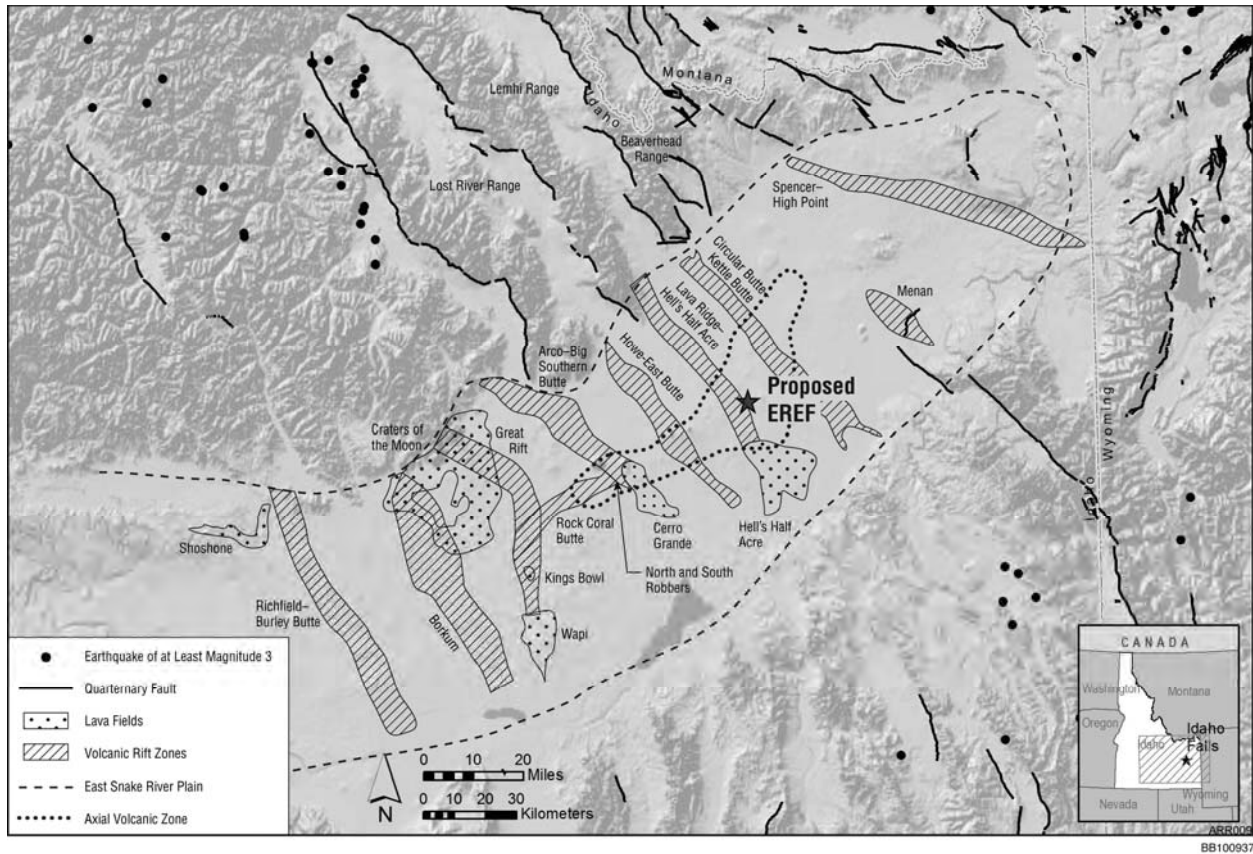
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5  
6  
7  
8  
9

**Figure 3-14 Regional Physiography (AES, 2010)**

During the late Pleistocene to late Holocene (recent), surficial processes such as glacial outburst flooding, range fires, and eolian erosion and deposition have contributed significantly to the appearance of the ESRP landscape. Extensive eolian deposition has produced thick blankets of loess across the ESRP and the areas to the southeast. These processes continue to modify the landscape today.



1  
2 **Figure 3-15 Lava Fields and Volcanic Rift Zones of the ESRP (modified from**  
3 **Payne, 2006; Quaternary fault and earthquake data from USGS and IGS, 2006)**

4  
5 **3.6.1.1 Seismic Setting, Earthquakes, and Volcanic Activity**

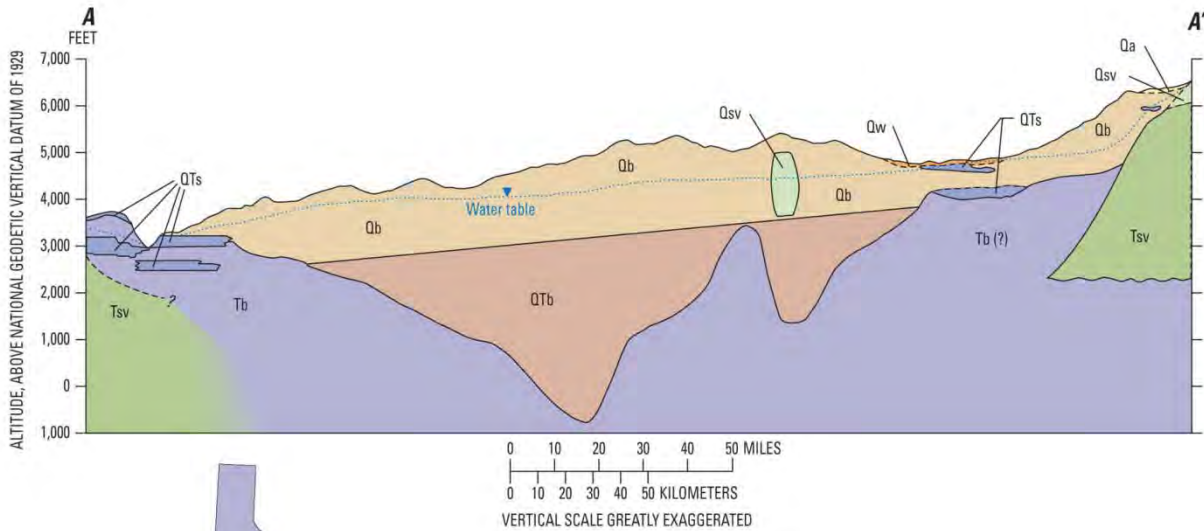
6  
7 **Seismic Setting**

8  
9 The proposed EREF site is situated on the axial volcanic zone, a northeast-to-southwest  
10 trending volcanic ridge that stretches across the middle of the ESRP (Figure 3-15). The ESRP  
11 is thought to mark the track of the Yellowstone hotspot, which is currently located beneath  
12 Yellowstone National Park in Wyoming. The hotspot was centered near the proposed EREF  
13 site about 4 to 10 million years ago (Smith, 2004).

14  
15 **Earthquakes**

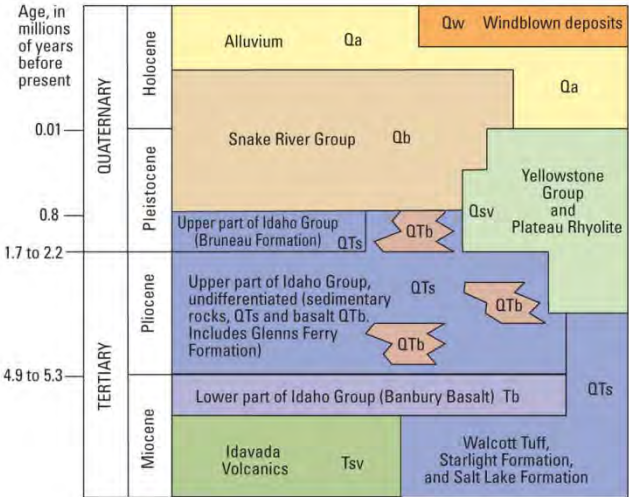
16  
17 Most earthquakes with the potential to affect the proposed EREF occur along the normal faults  
18 in the Basin and Range province north of the ESRP (Figure 3-15). These faults are capable of  
19 magnitudes of 7 or greater on the Richter scale and have recurrence intervals on the order of  
20 thousands or tens of thousands of years. Earthquakes within the Basin and Range province  
21 indicate extension in a predominantly northeast-southwest direction. Crustal extension began in  
22 this area in the Middle Miocene, about 16 million years ago. The ESRP itself is less seismically  
23 active, although very low level seismic activity is common. Seismic history and geologic  
24 conditions indicate that earthquakes with a magnitude of more than 5.5 and the associated





**EXPLANATION AND DESCRIPTION OF MAP UNITS**

- Qa** Chiefly flood-plain deposits. May contain some glacial deposits and colluvium in the uplands. Clay, silt, sand, gravel, and boulders.
- Qw** Chiefly windblown deposits. Includes some lake and glacial-flood deposits.
- Qb** Olivine basalt, dense to vesicular; irregular to columnar jointing; thickness of individual flows averages about 20-25 feet (Mundorff and others, 1964, p.143). Includes beds of basalt cinders, rubbly basalt, and interflow sedimentary rocks.
- Qsv** Rhyolitic ash-flow tuff, occurs as thick flows and blankets of welded tuff with associated fine- to coarse-grained ash and pumice beds.
- QTb** Olivine basalt similar to Qb above.
- QTs** Subaerial and lake deposits of clay, silt, sand, and gravel. Compacted to poorly consolidated.
- Tb** Flood-type basalt, dense; columnar jointing in many places. May include some rhyolitic and andesitic rocks. Queried where uncertain.
- Tsv** Rhyolitic, latitic, and andesitic rocks, massive and dense.



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1  
2  
3  
4

**Figure 3-16 General Stratigraphy of the ESRP (adapted from Ackerman et al., 2006)**

1 strong ground shaking and surface rupture would probably not occur within the ESRP; however,  
2 moderate to strong ground shaking from earthquakes in the Basin and Range province could be  
3 felt at the proposed EREF site (DOE, 1996; Hughes et al., 1999; Weston Geophysical  
4 Engineers, 2008).

5  
6 Figure 3-17 shows the peak horizontal acceleration in the ESRP region as a percentage of the  
7 acceleration of gravity, g, which has a 10 percent probability of being exceeded over a 50-year  
8 period. The peak horizontal acceleration ranges from 0 g (insignificant ground-shaking) to 1 g  
9 (strong ground-shaking). The highest ground-shaking hazard in the region occurs to the north  
10 of the ESRP and along the Intermountain Seismic Belt to the west, with the highest probable  
11 peak acceleration (greater than 0.30, or 30 percent of g) occurring in western Wyoming. In the  
12 region of the proposed EREF property on the ESRP, the probable peak acceleration is low, in  
13 the range of 0.05 g to 0.07 g (equal to or less than 7 percent of g), because the region is  
14 underlain by hard rock and seismically active areas are at some distance away.<sup>10</sup>

15  
16 A probabilistic seismic hazard study conducted by Weston Geophysical Engineers (2008)  
17 determined that the peak horizontal accelerations for annual probabilities of once in 1000 ( $10^{-3}$ ),  
18 10,000 ( $10^{-4}$ ), and 100,000 ( $10^{-5}$ ) years would be 0.063g, 0.15g, and 0.30g, respectively.<sup>11</sup>  
19 These estimates are in agreement with similar studies conducted at INL by DOE (1996) and  
20 Payne et al. (2000). Similar levels are now part of the seismic design criteria for new facilities at  
21 INL (Payne, 2008). Additional information on seismic hazards is provided in the SER (NRC,  
22 2010).

### 23 24 **Volcanic Activity**

25  
26 Early volcanism associated with the Yellowstone hotspot produced large-volume silicic  
27 eruptions that were followed by predominantly basaltic volcanism. Currently, basaltic volcanism  
28 occurs within the several northwest-trending volcanic rift zones and the axial volcanic zone  
29 (Figure 3-15). The most recent and closest volcanic eruption occurred at Craters of the Moon  
30 National Monument, 43.5 kilometers (27 miles) southwest of the proposed site, about  
31 2000 years ago (Payne, 2006).

32  
33 Using the probabilistic approach of Hackett et al. (2002), a recent volcanic hazard analysis  
34 determined that the major volcanic hazard at the site of the proposed EREF is the inundation  
35 and burning of facilities by basaltic lava flows in the event of an eruption within the volcanic rift  
36 zones of the ESRP (Figure 3-15). Hazards associated with basalt flows are listed in Table 3-15.  
37 The mean annual probability of a basaltic eruption that could impact the proposed EREF is

---

<sup>10</sup> Seismic waves during an earthquake cause ground-shaking that radiates outward from the rupturing fault. Shaking intensity is mainly a function of an earthquake's magnitude and the distance from the fault, but can be amplified by other factors, such as the softness of the ground (soft rocks and sediments versus hard rock) and the total thickness of sediments below the area. Shaking tends to be stronger in soft rocks and sediments and increases with increasing thickness of underlying sediments (Field et al., 2001).

<sup>11</sup> Peak horizontal acceleration is expressed as a percentage of gravity (g), a common value of acceleration equal to  $9.8 \text{ m/s}^2$ , the acceleration due to gravity at the earth's surface. Peak horizontal acceleration values range from 0 (insignificant ground shaking) to 1.0 (very strong ground shaking).



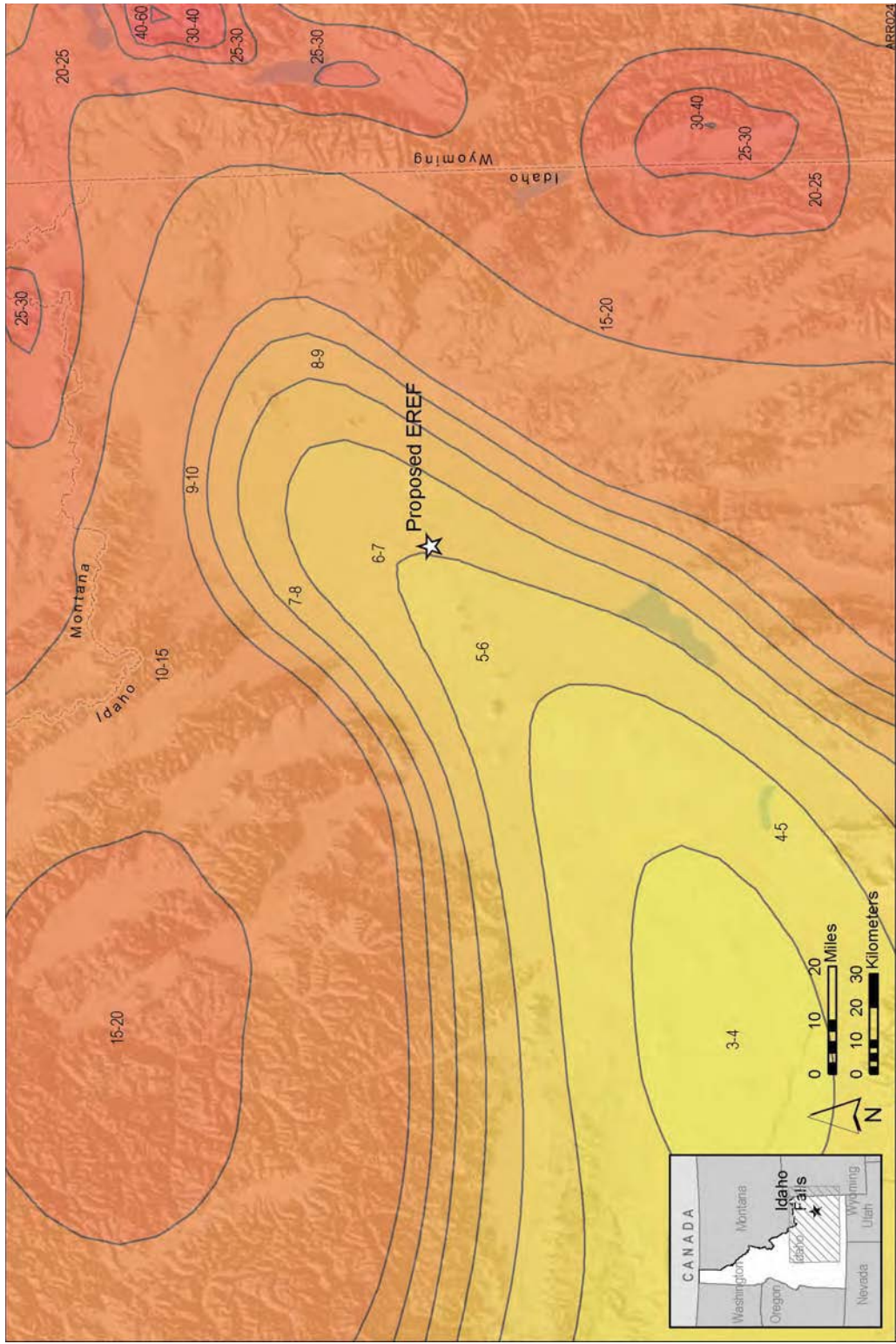


Figure 3-17 Peak Horizontal Acceleration (as a percent of g) near the ESRP (USGS, 2008a)

1 about  $3.7 \times 10^{-6}$  (with estimated upper and lower bounds ranging from  $10^{-5}$  to  $10^{-7}$ ). The  
2 proposed EREF site lies within a shallow topographic basin with an area of about 230 square  
3 kilometers (89 square miles). The basin is larger than the median and mean areas of lava flows  
4 measured within the INL site (to the northwest), and it is estimated that 70 percent of lava flows  
5 erupted from a vent within the basin would reach the proposed EREF site. Eruptions along the  
6 axial volcanic zone, however, would likely inundate the entire topographic basin, including the  
7 proposed EREF site (AES, 2010).

8  
9 Sources of more explosive silicic volcanism include: the potentially new or reactivated caldera  
10 volcanoes on the ESRP; the Yellowstone Plateau volcanic field, about 230 kilometers  
11 (143 miles) to the northeast; and ash-fall deposits from the volcanoes of the Cascade range,  
12 more than 700 kilometers (435 miles) west. The estimated recurrence of silicic volcanism within  
13 the volcanic axial zone is  $4.5 \times 10^{-6}$  per year. Hazards associated with silicic volcanism are  
14 considered to be less important than for basaltic volcanism in the area of the proposed EREF  
15 since the spatial distribution of Quaternary rhyolite flows in the area (e.g., at INL) generally  
16 impacts smaller areas than basalt flows. Pyroclastic flows and ash-fall deposits are also  
17 considered to pose no significant hazard in the area of the proposed EREF (AES, 2010). The  
18 annual probabilities calculated for the proposed EREF site are consistent with those made by  
19 Hackett et al. (2002) for facilities in the southwestern portion of INL. Additional information on  
20 volcanic hazards is provided in the SER (NRC, 2010).

### 21 22 **3.6.1.2 Mineral and Energy Resources**

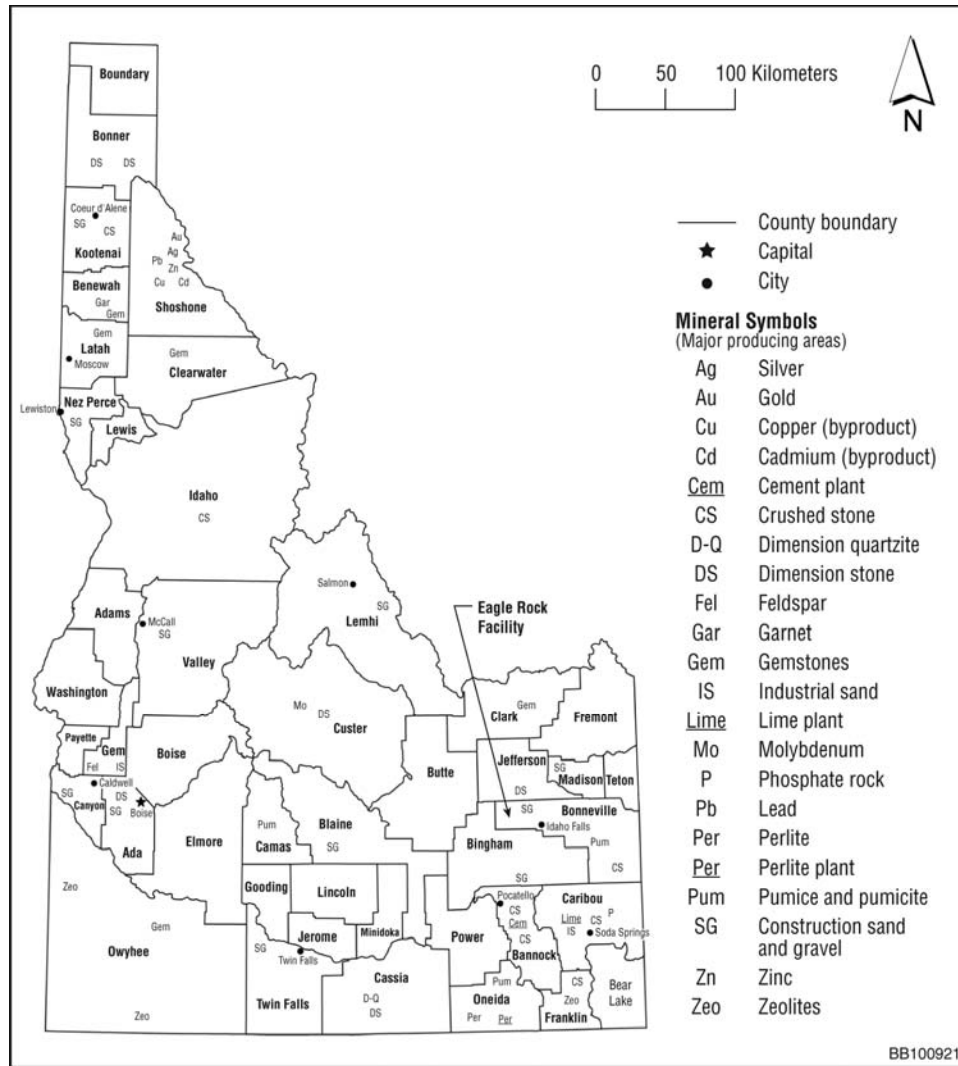
23  
24 AES has not found any abandoned drill holes or former or existing production wells to indicate  
25 petroleum was drilled for or produced within the site of the proposed EREF. The NRC staff  
26 verified during a site visit that there are no current mining operations at the proposed EREF site.  
27 According to information collected by the Idaho Geological Survey (IGS) and U.S. Geological  
28 Survey (USGS), the top nonfuel minerals in Idaho are, in descending order of value,  
29 molybdenum concentrates, construction sand and gravel, phosphate rock, silver, crushed stone,  
30 lead, and portland cement. These minerals accounted for more than 96 percent of the State's  
31 total nonfuel mineral production in 2006 (USGS, 2008b). Figure 3-18 shows the potential  
32 mineral resources in Idaho. According to the USGS survey (USGS, 2008b), suitable mineral  
33 resources exist in Bonneville County for the extraction of construction sand and gravel, pumice  
34 and pumicite, and crushed stone for aggregate. The nearest quarrying operations for sand and  
35 gravel, pumice, and crushed stone are those at INL.

36  
37 Idaho has limited petroleum resources; however, there is interest in the production potential of  
38 the Overthrust Belt in southeastern Idaho and the Tertiary basin sediments in the far western  
39 portion of the Snake River Plain. An oil and gas well was recently drilled on private land near  
40 Gray's Lake in southeastern Idaho, about 100 kilometers (62 miles) from the proposed EREF  
41 site. Geothermal potential is high in Idaho. The first geothermal power plant, located at the Raft  
42 River site about 150 kilometers (93 miles) southwest of the proposed EREF site, began  
43 commercial operation in November 2007, with a 25-year, 13-megawatt full output purchase  
44 agreement with Idaho Power. Further exploration at Raft River is planned (Gillerman and  
45 Bennett, 2008).

**Table 3-15 Hazards Associated with Basaltic Volcanism on the ESRP**

Phenomenon	Relative Frequency	Size or Area of Influence	Hazard Level
Lava flow	Common	0.1 to 400 km <sup>2</sup> (0.039 to 154 mi <sup>2</sup> ) in area; up to 32 km (20 mi) in length based on sizes of ESRP lava flows of the past 400,000 years	Significant hazard; typical basaltic phenomenon; lava from fissures or shield volcanoes may inundate large areas downslope of vents and burn structures in its path
Ground deformation: fissuring, faulting, and uplift	Common; associated with virtually all shallow magma intrusion and eruption	Fissuring could affect areas of 10 km <sup>2</sup> (3.9 mi <sup>2</sup> ); minor tilting and broad uplift in areas to 40 km <sup>2</sup> (15 mi <sup>2</sup> )	Significant hazard due to shallow dike intrusion; "dry" intrusion may occur without lava flows, affecting smaller areas than for lava inundation
Volcanic earthquakes	Common; associated with magma intrusion before and during eruption	Maximum Richter scale magnitude of 5.5, with most events less than 3.0; ground vibration may affect facilities within 25 km (16 mi)	Low to moderate hazard; swarms of shallow earthquakes (less than 4-km [2.5-mi] focal depth) occur as dikes propagate underground
Gas release (toxic and corrosive vapors)	Common; associated with fissuring and lava eruption	Restricted to near-vent areas; may affect areas of several square kilometers downwind	Low hazard; local plume of corrosive vapor downwind from eruptive vent or fissure; cooled vapor may collect in local topographic depressions
Tephra fall (volcanic ash and bombs)	Common	Restricted to near-vent areas; may affect areas of several square kilometers downwind	Low hazard; basaltic eruptions are inherently nonexplosive and may form small tephra cones but little fine ash to be carried downwind
Base surge (ground-hugging blast of steam and tephra)	Rare	Effects limited to radius of several kilometers from vent; less than 10 km <sup>2</sup> (3.9 mi <sup>2</sup> )	Low hazard due to depth of water table (greater than 200 m [656 ft]); steam explosions due to interaction between ascending magma and shallow groundwater
Pyroclastic flow (ground-hugging flow of hot, pyroclastic material)	Extremely rare	Near vent; affected area less than 1 km <sup>2</sup> (0.39 mi <sup>2</sup> )	Very low hazard; as per tephra fall but affecting even smaller areas

Source: modified from Hackett et al., 2002.



1  
2 **Figure 3-18 Idaho Mineral Resources (modified from USGS, 2008b)**

3  
4 **3.6.2 Site Geology**

5  
6 The proposed EREF site is located in a shallow topographic depression within the axial volcanic  
7 zone between the Lava Ridge-Hells Half Acre and the Circular Butte-Kettle Butte rift zones  
8 (Figure 3-15). The surface is relatively flat and gently sloping, with small ridges and areas of  
9 rock outcrop. Elevations range from about 1556 meters (5105 feet) to about 1600 meters  
10 (5250 feet).

11  
12 The axial volcanic zone is underlain by numerous basalt lava flows erupted from fissures and  
13 small shield volcanoes over the past 4 million years. Basaltic rock outcrops of the Quaternary  
14 age Snake River Group cover a portion of the proposed site (especially in the northwestern and  
15 southern parts) and occur as low irregular ridges, small areas of blocky rubble with thin soils,  
16 and erosional surfaces in intermittent stream drainages. The basalts are strongly vesicular and  
17 show a range of oxidation and secondary mineral formation; some show columnar jointing.



1 Geologic mapping in the area suggests that the basalt flows at the proposed site originated from  
2 the volcanic vent at Kettle Butte (AES, 2010; Kuntz et al., 1994).

3  
4 Rock cores drilled at the proposed site identify numerous basalt flows, ranging in thickness from  
5 less than 0.6 to 15 meters (less than 2 to 50 feet). Rock cores sampled across the proposed  
6 EREF site indicate the depth to bedrock (basalt) ranges from 0 (at outcrop locations) to  
7 6.6 meters (0 to 21.5 feet) (Figure 3-19). In one core (GW-1), thin, vesicular pahoehoe flows  
8 occur at depths of 95, 131, 152, 157, and 209 meters (310, 430, 500, 515, and 685 feet). The  
9 tops of these flows are generally characterized by the presence of black, fine-grained to glassy  
10 crusts a few centimeters thick, with stretched vesicles, pervasive matrix oxidation, and olivine  
11 phenocrysts. Within a few meters of the lava-flow tops is a highly vesicular zone with closely  
12 spaced, vertically oriented cooling fractures. In thicker flows, the fractured lava grades  
13 downward into finely vesicular and nonvesicular (massive) lava of the flow interior (AES, 2010).

### 14 15 **3.6.3 Site Soils**

16  
17 Figure 3-20 presents a soil map of the proposed EREF site. Unconsolidated surficial material at  
18 the proposed site consists mainly of Pleistocene age loess deposits rather than soil developed  
19 *in situ*. The loess, composed of silt and sandy silt, is massive or faintly bedded and moderately  
20 to well-sorted. Small angular to subrounded basalt gravel is sparsely present (Scott, 1982).

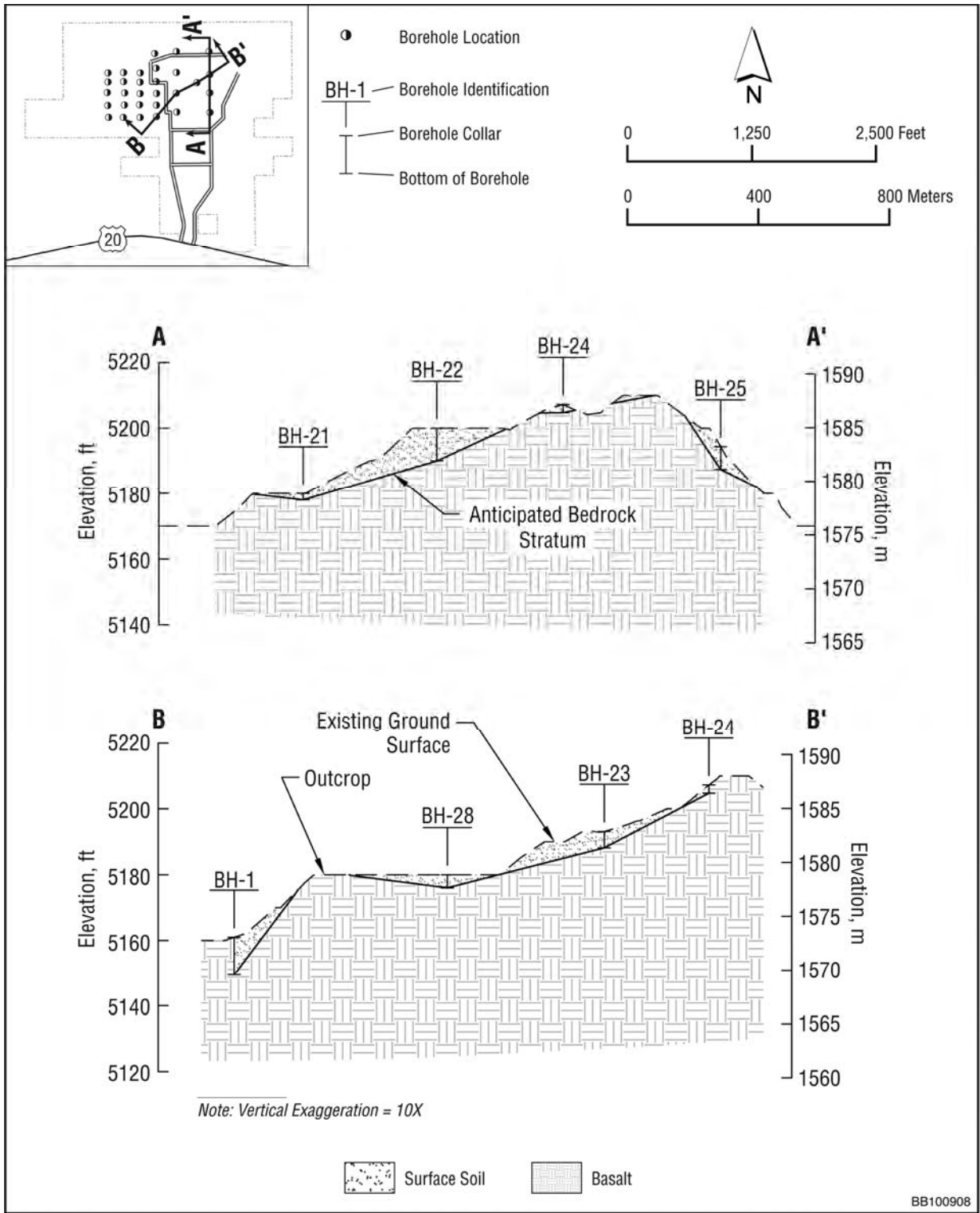
21  
22 The U.S. Department of Agriculture soil survey for Bonneville County categorizes most of the  
23 soils at the proposed EREF site as Pancheri silt loam, with slopes ranging from 0 to 8 percent.  
24 The Pancheri series consists of deep to very deep, well-drained soils that formed in loess-  
25 covered lava plains where the mean annual precipitation is about 25 centimeters (10 inches).  
26 Other soils at the proposed site include the Pancheri- and Polatis-rock outcrop complexes,  
27 which are moderately deep, well-drained, silt loams occurring on steeper slopes (up to  
28 25 percent) of basalt outcrops. Basalt outcrops occur as low irregular ridges of blocky rubble  
29 that cover about 28 percent of the total area of the proposed EREF site and as erosional  
30 surfaces within intermittent stream drainages (NRCS, 2009).

31  
32 Soils of the Pacheri silt loam (0 to 4 percent slope), which cover about 63 percent of the  
33 proposed EREF site, are classified as prime farmland (if irrigated) by the U.S. Natural  
34 Resources Conservation Service (NRCS) (NRCS, 2009).

### 35 36 **3.6.4 Soil Radiological and Chemical Characteristics**

#### 37 38 **3.6.4.1 Soil Radiological Characteristics**

39  
40 Ten surface soil samples were collected from various locations across the proposed EREF site  
41 as part of the initial characterization of soils (Figure 3-21). Samples were analyzed for uranium,  
42 thorium, and their daughter products. Potassium-40, a naturally occurring radionuclide, and  
43 cesium-137, produced by past weapons testing, were also measured. Table 3-16 presents the  
44 results of these measurements. The measured radionuclides are all naturally occurring, except  
45 for cesium-137, which is ubiquitous in the environment. Cesium-137 concentrations fall within  
46 the low end of the concentration range reported by the IDEQ for soil monitoring by *in situ*  
47 gamma spectrometry in and around the INL in 2006 and 2007 and well below the IDEQ action  
48 level of 6.8 picocuries per gram (IDEQ, 2006a, 2007c).



1

2

3

**Figure 3-19 Cross Sections Showing Depth to Basalt at the Proposed EREF Site (AES, 2010)**



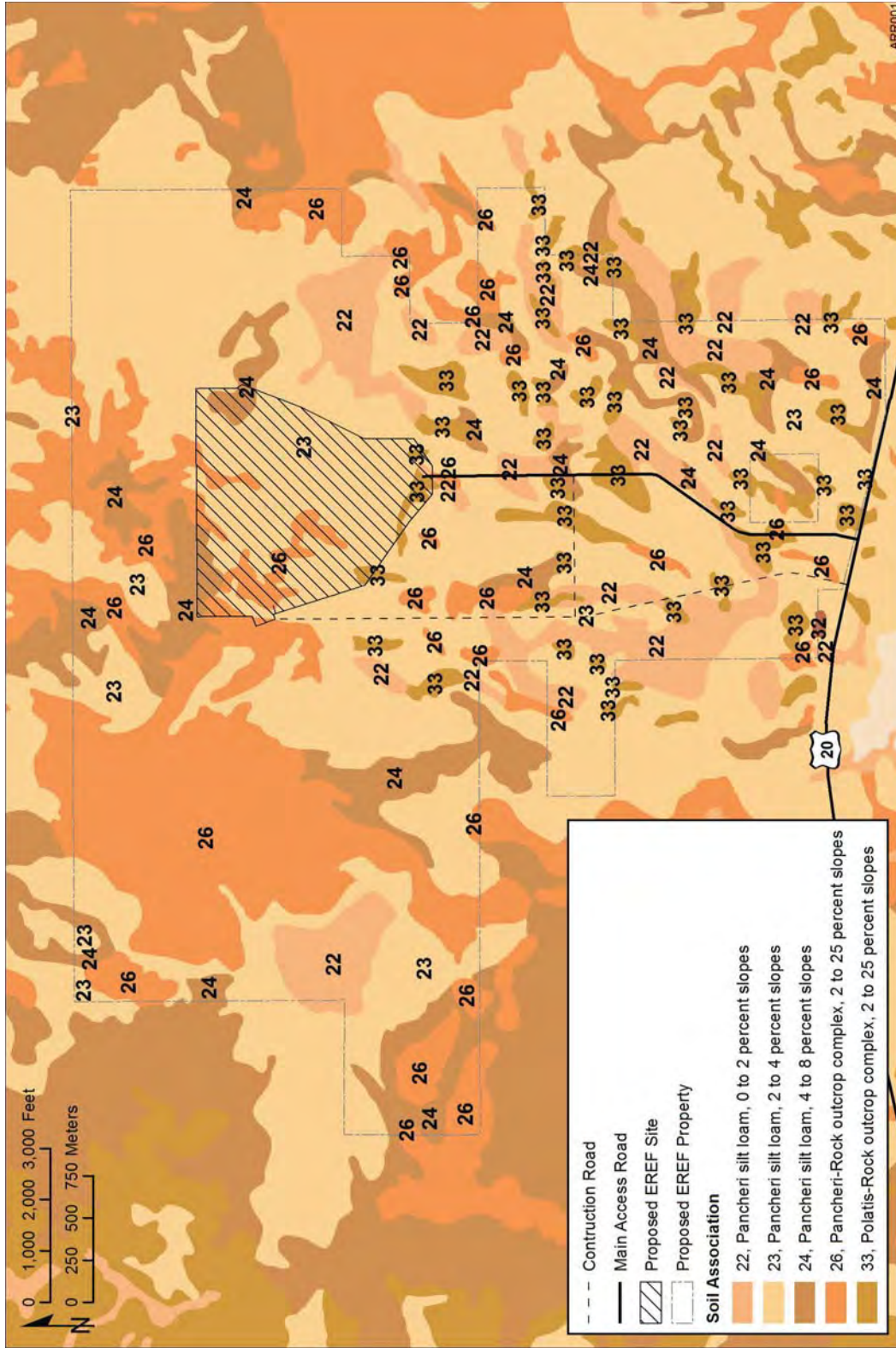


Figure 3-20 Soil Map of the Proposed EREF Site and Surrounding Area (based on data from NRCS, 2009)

1 **3.6.4.2 Soil Chemical Characteristics**

2  
3 The surface soil samples collected at the proposed EREF site were also analyzed for  
4 nonradiological constituents, including metals, pesticides, herbicides, phosphorous, fluoride,  
5 VOCs, and semivolatile organic compounds (SVOCs) (AES, 2010). Samples were also tested  
6 for percent moisture content. The results of the analyses for metals, fluoride, and moisture  
7 content in soils are summarized in Table 3-17. All metals fall within the range of background  
8 concentrations in surface soils reported for INL. Mercury was not detected in any of the  
9 samples. Moisture content varied from 9.1 to 16.5 percent.

10  
11 VOCs were detected in only one of the 10 samples analyzed. Sample SS1, located within one  
12 of the crop circles in the northeastern portion of the proposed EREF property (Figure 3-21), had  
13 detectable levels of three VOCs: 1,3,5-trimethylbenzene, 1,3-dichlorobenzene, and  
14 tetrachloroethene (Table 3-18). The compound 1,3-dichlorobenzene has applications as a  
15 fumigant and insecticide/pesticide; its presence is likely related to the farming activities at the  
16 proposed site. The compounds 1,3,5-trimethylbenzene and tetrachloroethene are typically used  
17 as solvents; the source of these two VOCs is not clear. All compounds were detected at levels  
18 well below EPA's regional screening levels for industrial soils (EPA, 2009a).

19  
20 Three SVOCs were detected in four soil samples (SS2, SS4, SS9, and SS10) from the  
21 north-central and south-central portions of the proposed property (Figure 3-21). These samples  
22 had detectable levels of benzo(a)pyrene, dibenzo(a,h)anthracene, and ideno(1,2,3-cd)pyrene  
23 (Table 3-18). These are a few of the many polycyclic aromatic hydrocarbons (PAHs) that are  
24 found in the environment, usually as a result of the incomplete combustion or pyrolysis of  
25 organic matter, such as fossil fuels (IPCS, 2009). All compounds were detected at levels well  
26 below EPA's regional screening levels for industrial soils (EPA, 2009a).

27  
28 Of all the pesticides and herbicides tested, only chlorpropham (a pesticide) was detected in four  
29 samples from the north-central portion of the proposed property (Table 3-18; Figure 3-21).  
30 Concentrations of chlorpropham were well below EPA's regional screening levels for industrial  
31 soils (EPA, 2009a).

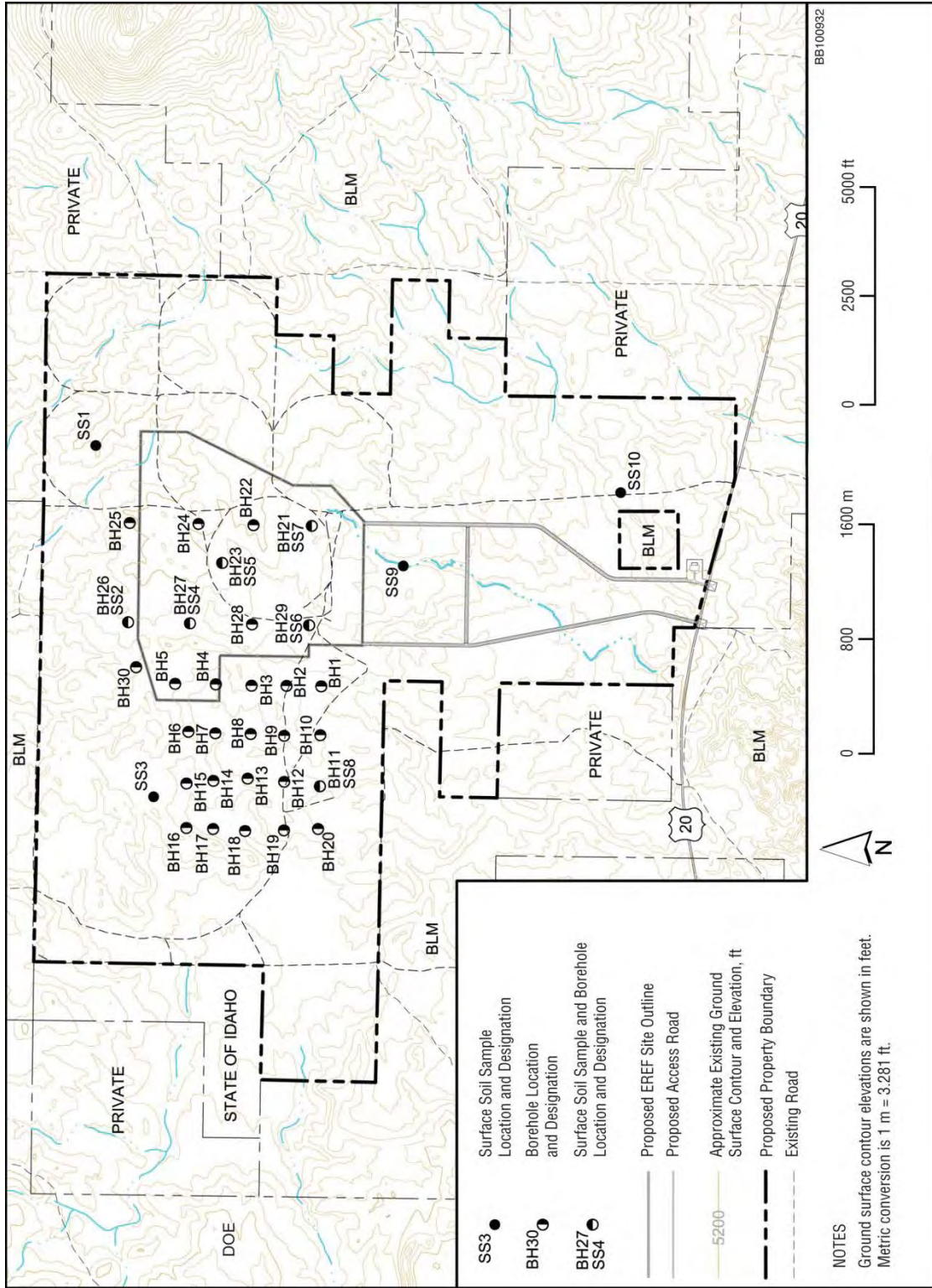
32  
33 **3.7 Water Resources**

34  
35 **3.7.1 Surface Water Features**

36  
37 **3.7.1.1 Rivers, Streams, and Lakes**

38  
39 The proposed EREF site is located in the American Falls sub-basin (HUC 17040206),  
40 immediately west of the Idaho Falls sub-basin (HUC 17040201), on the easternmost edge of the  
41 Snake River Plain in southeast Idaho (USGS, 2009b; IDEQ, 2006b; Shumar, 2004)  
42 (Figure 3-22). These sub-basins encompass a portion of the South Fork Snake River from  
43 Heise (about 32 kilometers [20 miles] northeast of Idaho Falls) to Henry's Fork and a section of  
44 the Snake River from the Henry's Fork confluence through the diversion dams south of Idaho  
45 Falls to the American Falls Reservoir. The Snake River is about 32 kilometers (20 miles) to the  
46 east of the proposed EREF site; it generally flows from the northeast to the southwest. The  
47 largest surface water bodies downgradient of the proposed site are on the Snake River – the  
48 American Falls Reservoir and Lake Wolcott, about 79 kilometers (49 miles) and 127 kilometers





**Figure 3-21 Surface Soil and Borehole Sample Locations (AES, 2010)**

**Table 3-16 Radiochemical Analyses of Proposed EREF Property Surface Soil**

Radionuclides	Measured Concentrations <sup>a</sup>		Representative Soil Concentrations <sup>b</sup>	
	Bq/kg	pCi/kg	Bq/kg	pCi/kg
Actinium-228 Thorium-228	38 ± 3.2	1020 ± 87.8	– <sup>c</sup>	–
Cesium-137	10 ± 4.4	288 ± 118	252 <sup>d</sup>	6800 <sup>d</sup>
Potassium-40	660 ± 57	17,900 ± 1540	400	10,800
Thorium-228	47 ± 4.8	1270 ± 131	–	–
Thorium-230	46 ± 5.0	1250 ± 136	–	–
Thorium-232	44 ± 3.5	1190 ± 92.0	37	999
Uranium-234	29 ± 2.5	784 ± 68.3	–	–
Uranium-235	3.3 ± 1.8	90.1 ± 48.9	–	–
Uranium-238	30 ± 2.7	805 ± 73.0	66	1782

<sup>a</sup> Concentrations noted as mean ± standard deviation; n=10 for all radionuclides but cesium-137 for which n=9. Source: AES, 2010.

<sup>b</sup> Representative soil concentrations are taken from Table 4.3 of the National Council on Radiation Protection (NCRP) Report No. 94 (NCRP, 1998).

<sup>c</sup> A dash indicates value is not available from NCRP, 1998.

<sup>d</sup> Value from the IDEQ INL Oversight Program (Jones, 2009).

1  
2 (79 miles), respectively, to the southwest of the proposed EREF site (Figure 3-22). There is an  
3 extensive network of canal systems that conveys water to agricultural areas near Idaho Falls.

4  
5 Major land uses within the American Falls sub-basin are dryland and irrigated agriculture and  
6 livestock grazing. All water bodies within the sub-basin support cold water aquatic life; water  
7 supplies for domestic, agricultural, and industrial use; wildlife habitat; and recreation. The  
8 American Falls Reservoir provides water for irrigation and electricity generation. The Snake  
9 River and the American Falls Reservoir are designated sources of domestic water supply  
10 (IDEQ, 2006b). The EPA has classified 17 waters within the sub-basin as impaired, mainly  
11 because of sedimentation and siltation problems (EPA, 2010a).

12  
13 There are no rivers, streams, or lakes within the proposed EREF property; however, a few small  
14 drainage features occur in the northeastern corner and in the southern portion of the proposed  
15 site (Figure 3-23). None of these features are regulated under Section 404 of the *Clean Water*  
16 *Act* (Joyner 2008). The drainage features in the northeastern corner are less visible in the field  
17 because they occur within the irrigated crop circles where the natural topography has been  
18 smoothed for crop production. Ephemeral drainage features in the southern portion of the  
19 proposed property were formed from natural erosional processes during snowmelt or episodic  
20 rain events, and they also drain water from irrigated agricultural areas. Most of these drainages  
21 lose water to infiltration and evapotranspiration; the potential for ponding of water is low

**Table 3-17 Metals, Soluble Fluoride, and Percent Moisture in Proposed EREF Property Surface Soil**

Analyte	Soil Concentrations (mg/kg) <sup>a</sup>										Detection Limit (mg/kg)	Background <sup>b</sup> (mg/kg)
	SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10		
Arsenic	5.5	7.7	5.5	7.1	6.6	7.3	6.7	7.1	6.9	6.5	1.3–1.8	3.7–24.4
Barium	160	180	180	200	170	170	200	170	170	190	0.50	87–255
Cadmium	0.56	0.61	ND <sup>c</sup>	0.69	0.59	0.58	0.74	0.57	0.6	0.55	0.50	1.3–2.8
Chromium (III)	21	20	20	25	23	21	23	21	22	25	0.50	14–27
Lead	15	16	14	18	16	16	17	16	16	18	0.60–0.81	9–28
Selenium	0.26	0.19	0.15	0.17	0.42	0.2	0.15	0.16	0.16	0.13	0.05	0.3–16.7
Silver	ND	ND	ND	0.7	ND	ND	ND	0.7	ND	ND	0.5–0.8	2.7–2.8
Total mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.05–0.06
Soluble fluoride	12	ND	ND	ND	10	ND	10	ND	ND	ND	5	– <sup>d</sup>
Percent moisture	15.9	12.2	9.1	12.2	15.7	11.1	15.7	11.8	16.5	10.5	0.1	–

<sup>a</sup> Source: AES, 2010.

<sup>b</sup> Background values from ranges of mean background levels compiled by Westinghouse Idaho Nuclear Company, Inc. (1994) for surface soils at INL.

<sup>c</sup> ND = not detected (the detection limit, i.e., the lowest measurable level, is reported in far right column).

<sup>d</sup> Dash indicates no data were reported.

1  
2 (NRCS, 2009). One drainage feature conveys water offsite. It starts in the south-central part of  
3 the proposed property within the footprint of the proposed EREF and runs southward toward  
4 US 20 (Figure 3-22). A series of small ponds to the north of US 20 were used at one time to  
5 collect and store water from this drainage for agricultural uses, but they are no longer in use and  
6 are currently dry. The NRC staff confirmed that a culvert at US 20 conveys water from this  
7 drainage to the south away from the roadway but does not connect to offsite resources or larger  
8 drainages.

9  
10 **3.7.1.2 Wetlands**

11  
12 There are no wetlands on the proposed EREF property (Joyner, 2008). The closest wetland is  
13 the Market Lake WMA, near Roberts, about 32 kilometers (20 miles) to the northeast. No  
14 commercial or sport fisheries are located on the proposed property; the nearest fisheries (trout)  
15 are on the Upper Snake River (Idaho Fish and Game Fisheries Region 7) along Henry's Fork  
16 (in Bonneville County) and the South Fork (IDFG, 2009c).

17  
18 **3.7.1.3 Floodplains**

19  
20 The proposed EREF property is not located within any 100-year or 500-year floodplains  
21 (FEMA, 2010). There are no reservoirs, levees, or surface water that could cause flooding of  
22 the proposed EREF. The Snake River is the closest river to the proposed EREF site. It is  
23 located about 32 kilometers (20 miles) to the east. Its headwater is a spring near the southern  
24 boundary of Yellowstone National Park in the northwestern corner of Wyoming. The USGS

Table 3-18 VOCs, SVOCs, and Pesticides Detected in Proposed EREF Property Surface Soil

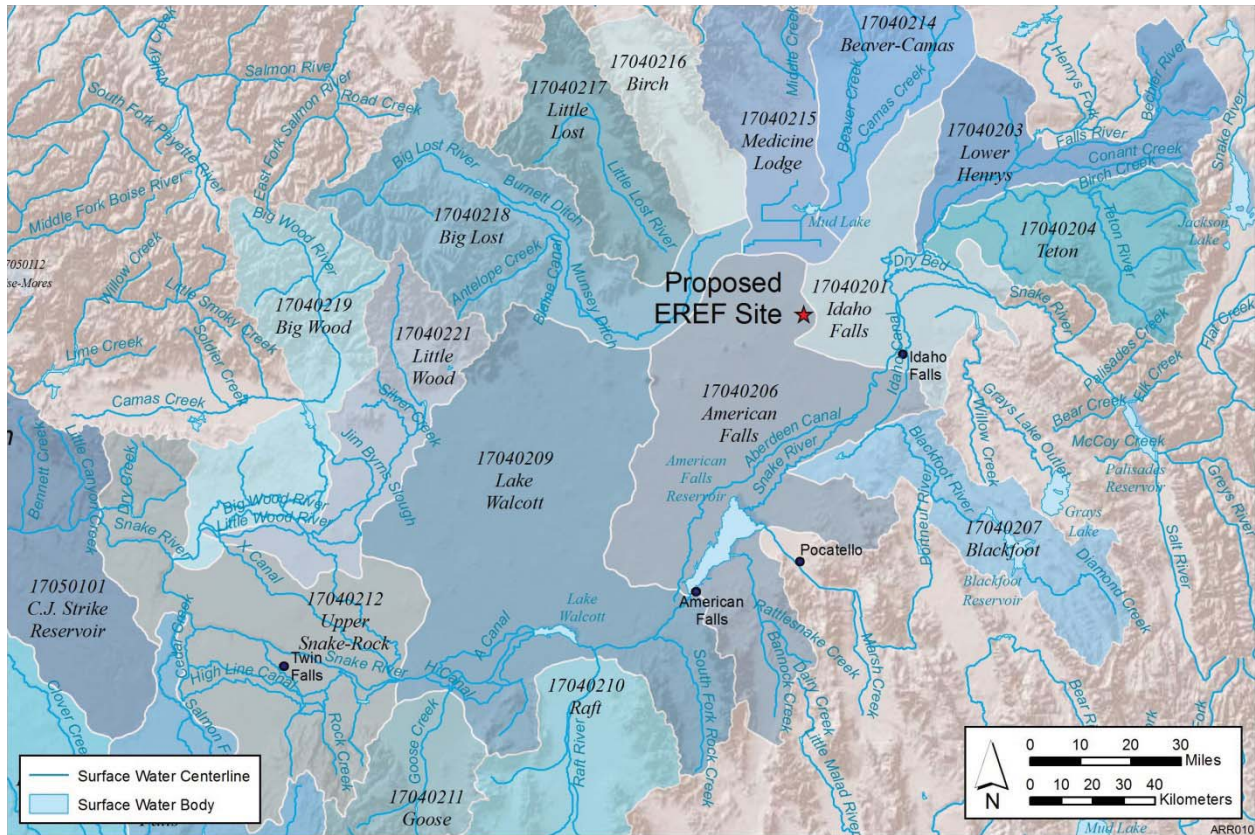
Analyte	Soil Concentrations (mg/kg)										Regional Screening Level (mg/kg) <sup>a</sup>	
	SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10		
<b>VOCs</b>												
1,3,5-Trimethylbenzene	0.0067	ND <sup>b</sup>	ND	ND	ND	ND	ND	ND	ND	ND	ND	200
1,3-Dichlorobenzene	0.0082	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10,000 <sup>c</sup>
Tetrachloroethene	0.0086	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.7
<b>SVOCs</b>												
Benzo(a)pyrene	ND	0.014	ND	0.035	ND	ND	ND	ND	0.059	0.014	0.21	
Dibenzo(a,h)anthracene	ND	0.012	ND	0.024	ND	ND	ND	ND	0.038	0.0099	0.21	
Ideno(1,2,3-cd)pyrene	ND	0.025	ND	0.081	ND	ND	ND	ND	0.146	0.024	2.1	
<b>Pesticide</b>												
Chlorpropham	ND	ND	ND	0.0074	ND	0.0055	ND	0.0110	ND	ND	ND	120,000

<sup>a</sup> Regional screening levels (RSLs) based on carcinogenic target risk for industrial soils, except for 1,3,5-trimethylbenzene and chlorpropham which are based on a noncancerous hazard index. Source: EPA, 2009a.

<sup>b</sup> ND = not detected.

<sup>c</sup> RSL not available for 1,3-dichlorobenzene; value provided is for 1,2-dichlorobenzene. Source: AES, 2010.

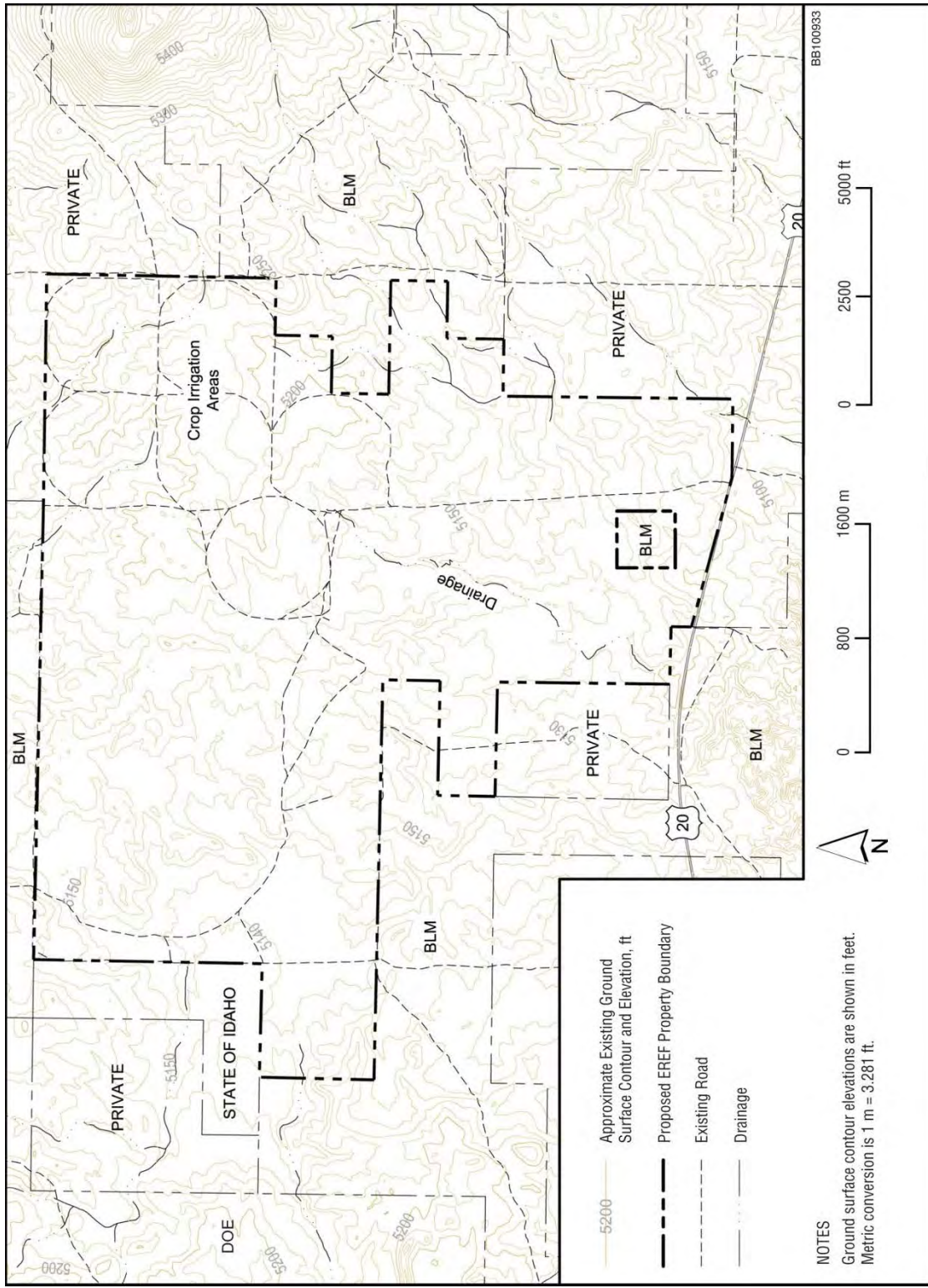




1  
2 **Figure 3-22 USGS-Designated Sub-basins within the Eastern Snake River Plain**  
3 **(adapted from Seaber et al., 2007)**

4  
5 station (13057155) on the Snake River above Eagle Rock (about 13 kilometers [8 miles]  
6 upstream of Idaho Falls) has an average daily flow of 162 cubic meters per second (5738 cubic  
7 feet per second), as measured between water years 1987 and 2008 (USGS, 2009c). During  
8 this period, monthly averages ranged from 87 cubic meters per second (3070 cubic feet per  
9 second) in December to 337 cubic meters per second (11,900 cubic feet per second) in June  
10 (USGS, 2009d). Annual average and peak flows at the Snake River above Eagle Rock station  
11 are shown in Figure 3-24. Annual peak flows tend to be about two to three times the average  
12 flow rates. The maximum flow rate at this site, 1376 cubic meters per second (48,600 cubic feet  
13 per second), occurred during a storm on June 16, 1997 (USGS, 2009e).

14  
15 According to the NCDC, southeastern Idaho has been in a drought since 2000. From 1988  
16 through 2000, the average annual flow recorded at the Snake River above Eagle Rock station  
17 was 164 cubic meters per second (5793 cubic feet per second); since 2000, the average annual  
18 flow at the station has been reduced to 127 cubic meters per second (4501 cubic feet per



**Figure 3-23 Drainage Features in the Vicinity of the Proposed EREF Site (AES, 2010)**



1 second) (USGS, 2009e). Recent data from NCDC (2009c) indicate some improvement in the  
2 region's drought conditions.<sup>12</sup>

### 3 4 **3.7.2 Groundwater Resources**

#### 5 6 **3.7.2.1 Regional Hydrogeology**

7  
8 Because the climate in southeastern Idaho is cold and semiarid, natural soil development due to  
9 the growth and decomposition of vegetation is minimal on the ESRP. Surface soils are  
10 predominantly of eolian (wind) origin; soil cover is variable, ranging from nonexistent in areas of  
11 recent volcanism to tens of meters thick in areas of loess (wind-blown silt) accumulation. Thin  
12 soils and basalt outcrops are common in many areas along ridge lines and wind-swept areas  
13 (Hughes et al., 1999; Lindholm, 1996; Whitehead, 1994).

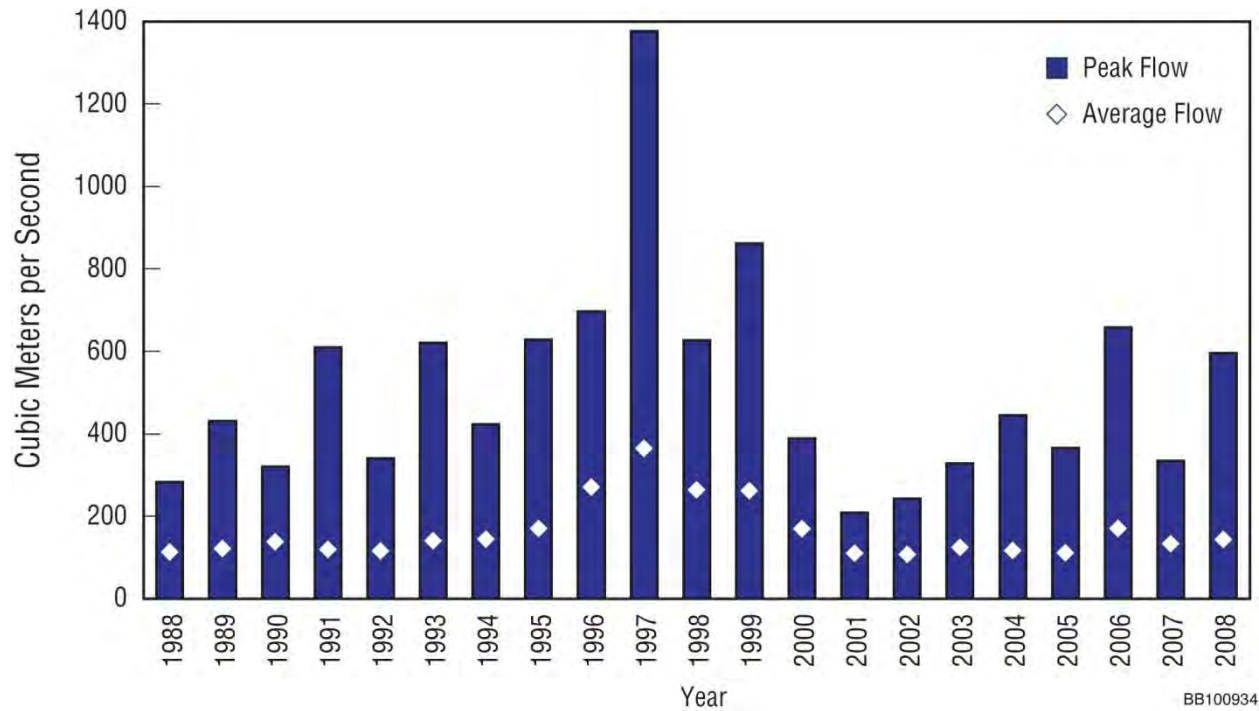
14  
15 Soil types on the ESRP fall into six orders of lightly weathered soils typical of arid climates:  
16 alfisols, aridisols, entisols, inceptisols, mollisols, and vertisols (based on the taxonomy of  
17 USDA, 2010a). Most of these soils fall into the silt-loam textural class: 0 to 27 percent clay,  
18 55 to 80 percent silt, and 10 to 35 percent sand. The mineralogy of soils at the INL reported by  
19 Nimmo et al. (2004) includes quartz, plagioclase, olivine, calcite, dolomite, and clay minerals;  
20 these are likely typical of the soils on the ESRP. Data summarized for INL by Nimmo et al.  
21 (2004) indicate that saturated hydraulic conductivities range from about  $5.0 \times 10^{-4}$  centimeters  
22 per second ( $1.6 \times 10^{-5}$  feet per second) to  $1.0 \times 10^{-2}$  centimeters per second ( $3.3 \times 10^{-4}$  feet per  
23 second), although reported ranges in the literature span over six orders of magnitude from  
24  $1.1 \times 10^{-8}$  centimeters per second ( $3.6 \times 10^{-10}$  feet per second) to  $1.2 \times 10^{-2}$  centimeters per  
25 second ( $3.9 \times 10^{-4}$  feet per second). Porosities ranged from 0.42 to 0.55, and moisture contents  
26 from about 5 percent to 30 percent were also reported.

27  
28 The vadose zone below the ESRP is spatially heterogeneous, ranging in thickness from  
29 60 meters (197 feet) to 300 meters (984 feet). It is made up of unconsolidated alluvium and  
30 basalts of the Snake River Group (Section 3.6.1). Perched water zones are common  
31 throughout the ESRP, especially near rivers, canals, or other sources of surface water. Water  
32 within the vadose zone moves (1) by diffusion that is predominantly vertical and driven by  
33 gravity and (2) by preferential flow that is both vertical and horizontal and influenced by the  
34 presence and orientation of pores and fractures within the basalts and by the interlayers of  
35 sediment between basalt flows (Nimmo et al., 2004; Smith, 2004).

36  
37 The groundwater system underlying the Snake River Plain in the vicinity of the proposed  
38 EREF site (and the source of its potable and process water supply) is the ESRP aquifer.  
39 The ESRP aquifer underlies an area of 26,000 square kilometers (10,040 square miles) and  
40 is up to 400 meters (1312 feet) thick, but it is most productive in the upper 90 to 150 meters  
41 (300 to 500 feet). Water volume in the ESRP aquifer is about 100 billion cubic meters  
42 (81 million acre-feet). The aquifer is largely unconfined; groundwater flows southwestwardly

---

<sup>12</sup> The NCDC uses the Palmer Drought Severity Index (PDSI) as a measure of long-term drought conditions. The PDSI takes into account precipitation, temperature, and soil moisture. Numbers range between -6.0 and +6.0, with negative numbers representing drier-than-normal conditions and positive numbers representing wetter-than-normal conditions (zero is normal). For the week ending February 20, 2010, the ESRP had a near-normal PDSI between -1.9 and +1.9 (NOAA, 2010).



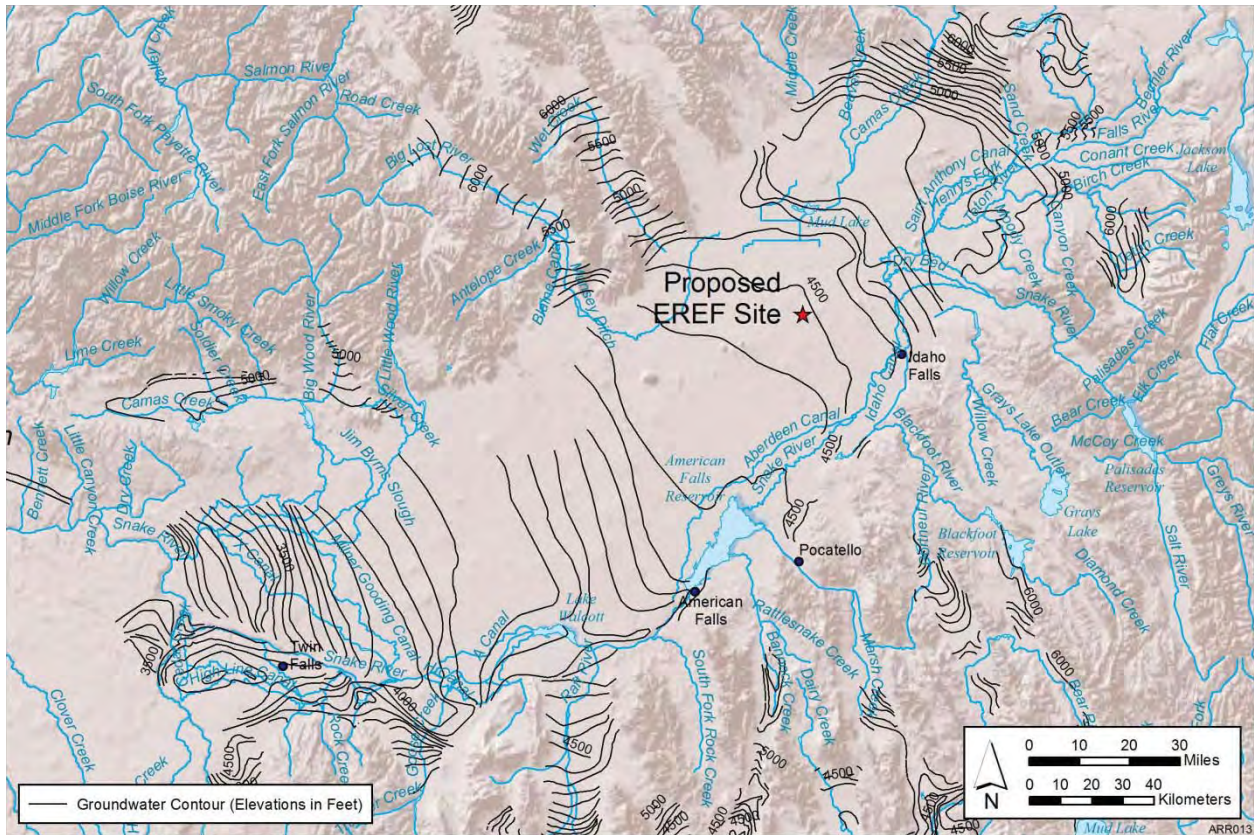
**Figure 3-24 Annual Average and Peak Flows at the Snake River above Eagle Rock Station (Source: based on data from USGS, 2009e,f)**

from recharge areas on the Yellowstone Plateau (and from precipitation- and surface-water-irrigated areas on the Snake River Plain) at an average gradient of 1.9 meters per kilometer (or 0.0019) and discharges to the Snake River through a series of springs between Twin Falls and King Hill. Flow velocities average about 3 meters per day (10 feet per day) (Smith, 2004; Wood and Low, 1988; Lindholm, 1996). Figure 3-25 shows groundwater flow contours for the ESRP aquifer based on data from the Idaho Department of Water Resources' (IDWR's) map service (IDWR, 2010).

### 3.7.2.2 Site Hydrogeology

Well logs show that most of the basalt bedrock below the proposed EREF site is fractured to some degree, although massive zones with few or no fractures (indicating basalt flow interiors) are also present. Flow interiors typically contain narrow vertical fractures; flow tops and bottoms have large vertical and horizontal fractures and are also marked by the presence of scoria, cinder, red oxidation, and increased vesicles. Massive zones in wells GW-1 and GW-4 (shown in Figure 3-26) are up to 3 meters (10 feet) in thickness. Three well-developed sedimentary interbeds, with thicknesses ranging from 1.2 to 2.4 meters (4.0 to 8.0 feet), were observed in GW-1 at depths of 18.3 meters, 59.4 meters, and 122.5 meters (60 feet, 195 feet, and 402 feet) (AES, 2010).

Field tests indicate that the aquifer is unconfined or semi-confined. Estimates of hydraulic conductivity (flow velocity) range from 0.007 meter per second (0.023 foot per second) to 0.015 meter per second (0.05 foot per second). Hydraulic conductivities are highest in the fractured basalt and lowest in sedimentary interbeds and massive zones within the basalt flow



**Figure 3-25 Groundwater Flow Contours for the ESRP Aquifer (IDWR, 2010)**

interiors. Sedimentary interbeds and massive basalt zones, therefore, significantly impede the downward movement of water and may cause perching above the water table or lateral flow (AES, 2010).

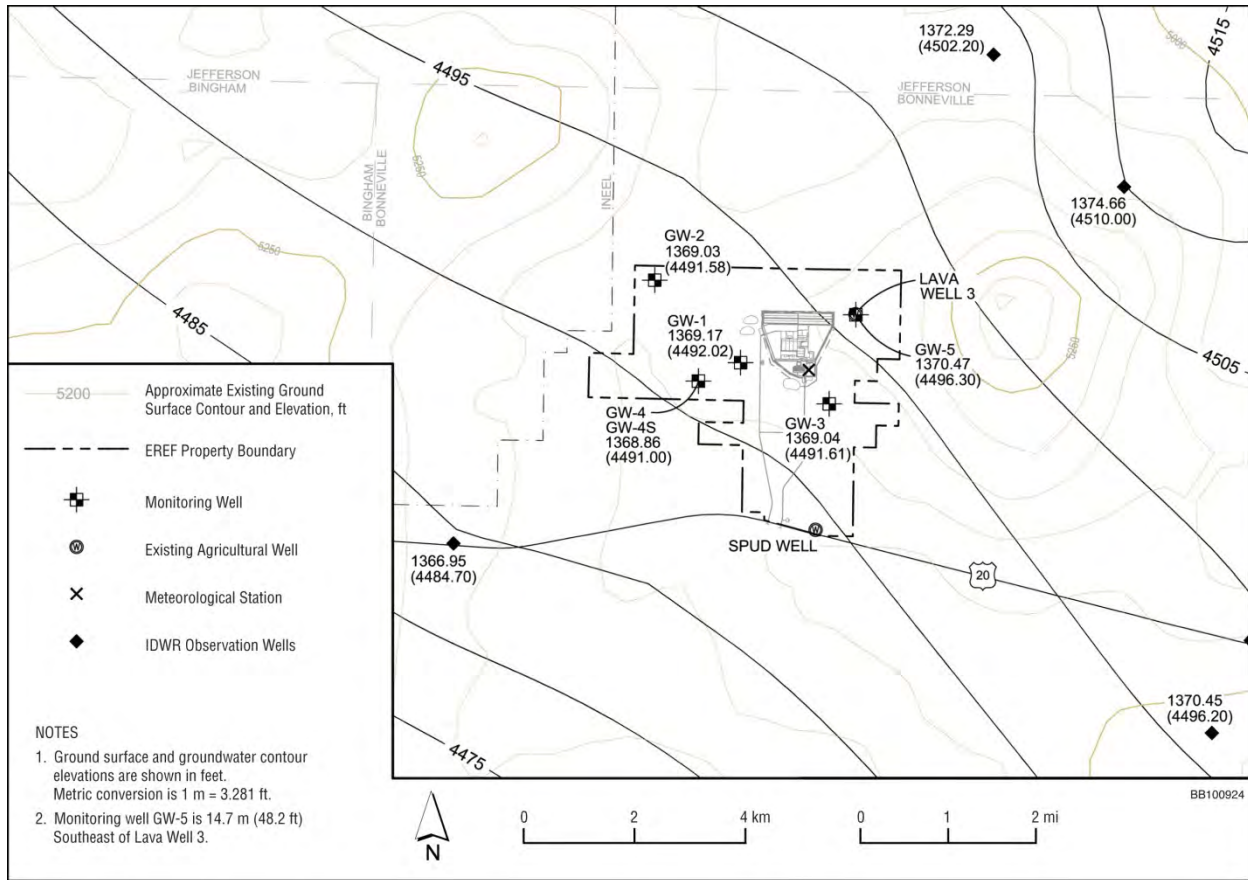
About 60 percent of the ESRP aquifer recharge comes from irrigation water; other sources of recharge include small aquifers in valleys along the plain's edge (about 18 percent), infiltration from rivers and canals (about 13 percent), and precipitation (rain and snow) (about 9 percent) (IWRB, 2009). Although low-permeability layers are present in the vadose zone, little or no perching of groundwater has been observed below the proposed site. Depth to groundwater in onsite wells ranges from 201.5 meters (661 feet) to 220.0 meters (722 feet) below the ground surface. Groundwater flow below the proposed EREF site is consistent with the regional groundwater flow, from the northeast to the southwest, with a hydraulic gradient that drops 1.3 meters (4.3 feet) over a distance of 2260 meters (7460 feet) between wells GW-5 and GW-1 (about 0.0006) (Figure 3-26).

### 3.7.2.3 Groundwater Use

#### Snake River Plain Aquifers

The aquifers of the Snake River Plain are located in the basalt flows that formed the 40,404-square-kilometer (15,600-square-mile), crescent-shaped lobe in southern Idaho





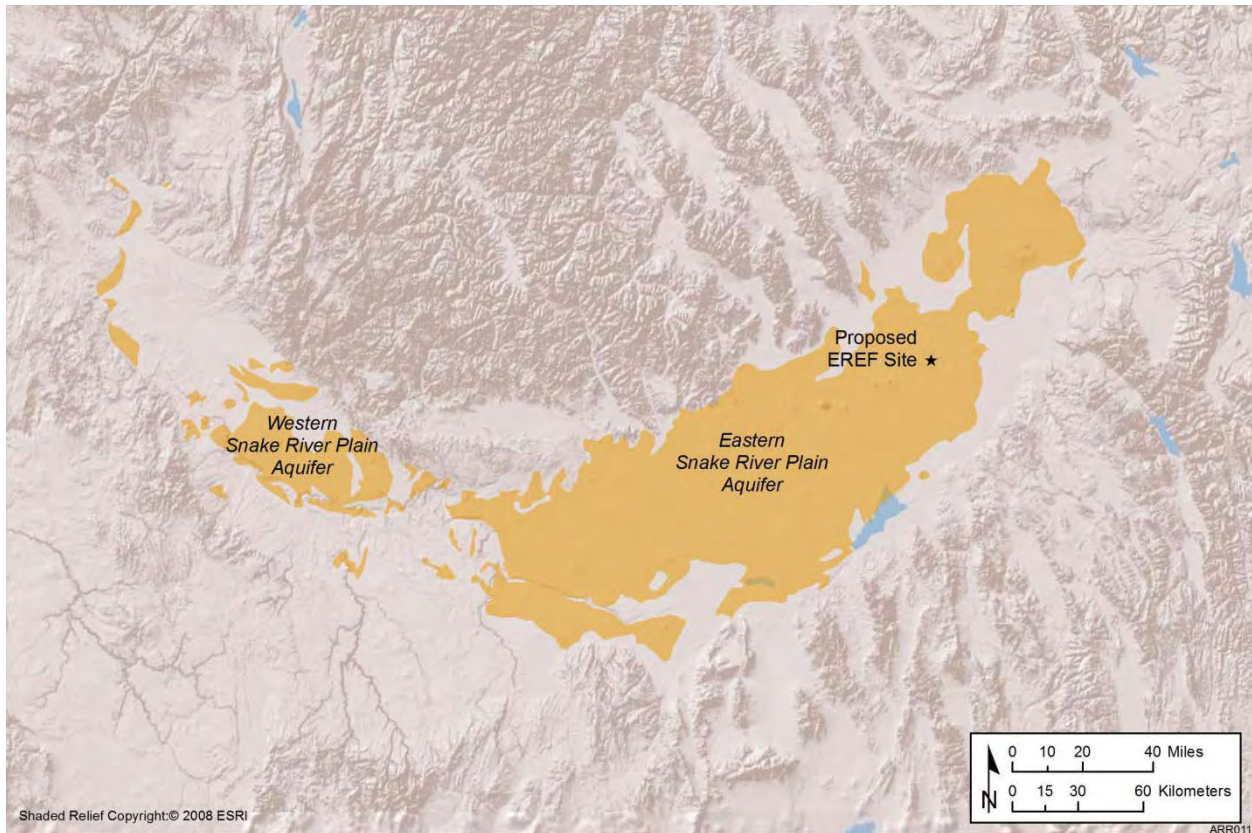
**Figure 3-26 Groundwater Potentiometric Surface Map for the Proposed EREF Property (AES, 2010)**

(Figure 3-27). The eastern half of the plain (the ESRP aquifer) consists of basalt flows with thicknesses up to 610 meters (2000 feet) that are overlain by and interbedded with unconsolidated sedimentary deposits. The western half is composed predominantly of unconsolidated sedimentary deposits with some basalt flows that are less thick than those making up the eastern half. The saturated thickness of the eastern half is much greater than that of the western half (Maupin and Barber, 2005). About 86 percent of the groundwater flowing through the Snake River Plain aquifers eventually discharges to the Snake River. The balance (about 14 percent) is withdrawn for irrigation, drinking water, and commercial and livestock use (IDEQ, 2005). In 2005, total water withdrawals – of both surface water and groundwater – in Bonneville County were 3.3 million cubic meters (882 million gallons per day or 988 thousand acre-feet per year). Groundwater withdrawn from the ESRP aquifer was about 19 percent of the total water withdrawn that year (USGS, 2010). The largest usage of groundwater in 2005 was for crop irrigation (at 96 percent). The second largest usage was for the public and domestic water supply (at 3.5 percent).

**Public Water Supply and Water Rights**

The ESRP aquifer was designated a sole source aquifer in 1991. A sole source aquifer is defined as one that supplies at least 50 percent of the drinking water in the petitioned area and





1  
2 **Figure 3-27 Snake River Plain Aquifers (modified from Maupin and Barber, 2005)**

3  
4 for which there is not a reasonably available alternative source to supply drinking water to all  
5 those who depend on the aquifer (EPA, 2009c). Currently, the ESRP aquifer is the sole  
6 source of drinking water for populations in southeast and south-central Idaho. The largest  
7 municipalities on the ESRP are Idaho Falls (Bonneville County) and Pocatello (Bannock  
8 County). The City of Idaho Falls operates a system of groundwater wells that meet an average  
9 daily usage of about 76,000 cubic meters (20 million gallons), with a maximum daily usage of  
10 about 220,000 cubic meters (58 million gallons). The City of Pocatello obtains its drinking water  
11 from the ESRP and Portneuf aquifers. Its municipal system meets an average daily usage of  
12 about 49,160 cubic meters (13 million gallons), with a maximum daily usage of about  
13 130,700 cubic meters (34 million gallons) (IDC, 2009).

14  
15 The proposed EREF would use groundwater appropriated by a 1961 water right that would  
16 transfer to AES with the purchase of the proposed EREF property. The transfer approval notice  
17 (for Water Right No. 35-2642) specifies an annual industrial diversion rate of 1713 cubic meters  
18 per day (452,527 gallons per day) and an annual irrigation diversion rate (from April 1 to  
19 October 31) of 147 cubic meters per day (38,833 gallons per day) (Carlsen, 2009). The primary  
20 point of diversion would be the existing onsite agricultural well (Lava Well; Figure 3-25) and an  
21 additional well installed to supply potable water.  
22  
23

#### 3.7.2.4 Groundwater Quality

The upper portion of the ESRP aquifer has a predominantly calcium bicarbonate composition and is of high quality when compared with drinking water standards. The concentrations of minor elements and metals in the aquifer are generally low due to its neutral to slightly alkaline pH and moderately reducing conditions (Lindholm, 1996; Wood and Low, 1988).

Currently, there are two agricultural wells (Lava Well 3 and Spud Well), five deep aquifer monitoring wells (GW-1 through GW-5), and one shallow perched water well (GW-4S) at the proposed EREF site (Figure 3-25). Well GW-4S has been dry since it was installed. Water from monitoring wells GW-1 through GW-5 were sampled following their completion in May and July 2008 and then again in October 2008. The agricultural wells were sampled in March, May, and October 2008. Samples from all wells were analyzed for metals (dissolved and total<sup>13</sup>), total organic carbon, VOCs, SVOCs, PCBs, total petroleum hydrocarbons, pesticides, and herbicides (AES, 2010). Analytes were compared to the EPA's maximum contaminant levels (MCLs) and secondary MCLs (SMCLs),<sup>14</sup> since these represent stringent limits for potable water supplies (EPA, 2010b).

Total dissolved solids in onsite well samples were found in the range of 200 to 260 milligrams per liter, less than the EPA MCL of 500 milligrams per liter. Dissolved metal concentrations were also detected at levels below their corresponding MCL. Except for aluminum and iron, which were found in samples from the agricultural wells, total metal concentrations were below the EPA MCLs. Aluminum and iron concentrations likely resulted from the presence of suspended particles, which do not dissolve in the slightly alkaline pH of the aquifer.

No VOCs, SVOCs, PCBs, pesticides, or herbicides were detected in groundwater samples collected in March, May, and July 2008. October 2008 samples from some monitoring wells contained low levels of plasticizers (bis[2-ethylhexyl]phthalate and diethylphthalate) and trace amounts of chloroform. Low levels of lubricating oil were also detected in samples from some wells. These concentrations likely resulted from contamination introduced by sample handling (e.g., collecting or laboratory analysis) and drilling (in the case of the lubricating oil) and do not represent contamination within the aquifer.

Radiological analyses (gamma spectroscopy, gross alpha and beta, and tritium) were also performed on groundwater samples collected in 2008. Radium-224 and -228 and uranium-234, -235, and -238 were detected in some monitoring wells. Radium-228 and uranium-234, -235, and -238 were all below their respective EPA MCLs (5 picocuries per liter and 20 picocuries per liter). Detectable levels of gross beta were found in some monitoring wells, but in each case, they were less than the EPA MCL of 15 picocuries per liter. Tritium was detected in one well (GW-3) at a concentration of 530 picocuries per liter in May 2008. The EPA MCL for beta particle and photon radioactivity from radionuclides (like tritium) in drinking water is 4 millirem

<sup>13</sup> Total metals in groundwater consist of those metals that are dissolved as free ions and metal complexes and those that are suspended (and filterable) as adsorbed or precipitated particles.

<sup>14</sup> The *Safe Drinking Water Act* defines primary drinking water standards or MCLs as the maximum permissible level of a contaminant in public drinking water. Secondary drinking water standards or SMCLs are for contaminants that are not threatening to health but could give rise to undesirable aesthetic (e.g., taste or odor), cosmetic (e.g., skin discoloration), or technical (e.g., corrosivity) effects.

1 per year; the average concentration of tritium that would yield this level of radioactivity is about  
2 20,000 picocuries per liter (EPA, 2002). The concentration of tritium (530 picocuries per liter)  
3 detected in well GW-3 represents about 3 percent of that concentration.  
4

### 5 **3.8 Ecological Resources**

6  
7 This section describes the ecological resources, including plant communities; wildlife; rare,  
8 threatened, and endangered species; wetlands; and environmentally sensitive areas, of the  
9 proposed EREF site and property and surrounding areas. Surveys were conducted by AES in  
10 June and October 2008 for vegetation on the property and in May, June, and October 2008,  
11 January and April 2009, and April 2010 for wildlife. Ecological surveys also have been  
12 conducted at INL, a 2305-square-kilometer (890-square-mile) DOE laboratory about  
13 1.6 kilometers (1 mile) west of the property, for more than 50 years.  
14

#### 15 **3.8.1 Plant Communities**

16  
17 The EPA through its Western Ecology Region has developed, in cooperation with the  
18 U.S. Forest Service and the National Resource Conservation Service (formerly the Soil  
19 Conservation Service), a common framework for describing, classifying, and mapping ecological  
20 regions of the United States. The ecological regions mapped are typically geographically large.  
21

22 These geographically distinct areas are associated with clearly observable groupings of plant  
23 and animals that live there under specific environmental conditions. The EREF property is  
24 located in what is called the Snake River Plain (Ecological Region 12), an area that covers  
25 about 51,023 square kilometers (19,700 square miles) (McGrath et al., 2002). The region is  
26 further divided into ten sub-regions, three of which are associated with the area ecology and/or  
27 the EREF property. These sub-regions are the: (1) 12b Lava Fields, (2) 12g East Snake River  
28 Basalt Plain, and (3) 12e Upper Snake River Plain. The approximate size of the sub-regions is  
29 1100, 6400 and 1500 square miles, respectively. The Snake River Plain is also referred to as  
30 the Sagebrush Steppe, and in its more native state (12g) is characterized by large expanses of  
31 sagebrush and a variety of native grasses with saltbush and shad scale found in the saltier  
32 soils. The major difference between the 12g and 12e types is that the latter typically has deeper  
33 soils and where irrigation is available is used for the production of pastures and small grains  
34 such as wheat, potatoes, sugar beets, beans, and alfalfa. Type 12b is the lava field and can be  
35 found at the Craters of the Moon National Monument and Preserve.  
36

37 A fairly large part of this ecological region is located in within the BLM's Upper Snake land unit  
38 managed out of its field office in Idaho Falls, Idaho. The boundaries of the Upper Snake unit  
39 total about 11,100 square miles or 7.1 million acres and roughly correspond to the same  
40 ecological sub-regions described under the EPA mapping system for the sagebrush steppe  
41 region. About 4000 square miles or 2.6 million acres (36.1 percent) are privately held lands,  
42 about 2800 square miles or 1.8 million acres (25.3 percent) are managed by BLM, about  
43 2600 square miles or 1.7 million acres (23.4 percent) are managed by the U.S. Forest Service,  
44 and about 600 square miles or 0.4 million acres (5.3 percent) are owned by the State of Idaho.  
45 The nearby INL contains about 900 square miles or 0.6 million acres (8.0 percent). Together  
46 these land groupings total over 90 percent of the 7.1-million-acre BLM land management unit.  
47



1 The BLM is tasked with the management of the rangeland under its control for multiple uses.  
2 Principal activities managed include grazing, wildlife habitat, hunting, and recreation, and this is  
3 performed under a comprehensive range management plan (RMP). Periodically the BLM  
4 reevaluates its current management plan and revises it. Revising an RMP is considered to be a  
5 major Federal action and requires that the BLM prepare an EIS. On February 28, 2008, the  
6 BLM published in the *Federal Register* a Notice of Intent to prepare an EIS to revise the Upper  
7 Snake RMP (73 FR 10802) and has completed a Final Public Scoping Report. The RMP  
8 planning process is a cooperative effort involving, in part, the DOE, EPA, U.S. Forest Service,  
9 the FWS, and a number of Idaho government agencies including the Department of Fish and  
10 Game, Department of Agriculture, and Department of Parks and Recreation.

11  
12 The BLM Field Office estimates that 98 percent of the RMP area consists of sagebrush steppe  
13 and that the largest single land use for the public lands is livestock grazing. The BLM received  
14 684 comments that were then grouped into seven planning issues. The seven planning issues  
15 identified are now being used to develop alternatives to be evaluated in the EIS. Two of the  
16 seven issues listed relate directly to the scope of the AES EIS and include impacts to the  
17 long-range health of the Sagebrush Steppe and its wildlife and plant communities and the  
18 resolution of conflicts over livestock grazing.

19  
20 In 1995, the National Biological Service listed the Sagebrush Steppe ecosystem as a critically  
21 endangered ecosystem across its entire range (BLM/DOE, 2004) and has experienced more  
22 than a 98 percent decline since European settlement. The INL Sagebrush Steppe Ecosystem  
23 Reserve was established in 1999. This reserve is significant in many respects, not the least of  
24 which is the fact that it is currently the largest non-grazed reserve of sagebrush steppe in the  
25 region with approximately 40 percent of the area not having been grazed for over 50 years, and  
26 is the closest example of what the sagebrush steppe looked like before European settlement.  
27 The site maintains a long-term management plan that is jointly implemented and administered  
28 by DOE and the BLM in consultation with the FWS and the Idaho Department of Fish and  
29 Game. The most recent management plan was finalized in May 2004 (Final Management Plan  
30 EA ID-074-02-067 Finding of No Significant Impact) with a preferred alternative of multiple land  
31 use with a continued emphasis on natural resource protection and controlled livestock grazing  
32 principally on the BLM land within the boundaries of INL.

33  
34 Large areas of the INL site support high-quality, relatively undisturbed sagebrush steppe  
35 habitat, and are included in the INL Sagebrush Steppe Ecosystem Reserve (BLM/DOE, 2004).  
36 Species diversity is high because of the reduced level of disturbances, such as grazing.  
37 Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and basin big sagebrush  
38 (*Artemisia tridentata* ssp. *tridentata*) are the dominant shrubs in this habitat; other frequently  
39 occurring shrubs include green rabbitbrush (*Chrysothamnus viscidiflorus*), winterfat  
40 (*Krascheninnikovia lanata*), prickly phlox (*Leptodactylon pungens*), and spiny hopsage (*Grayia*  
41 *spinosa*) (BLM/DOE, 2004). Perennial grasses commonly occurring in this habitat include thick-  
42 spiked wheatgrass (*Elymus lanceolatus*), Indian ricegrass (*Achnatherum hymenoides*), needle-  
43 and-thread (*Hesperostipa comata*), and Sandburg bluegrass (*Poa secunda*), while fernleaf  
44 biscuitroot (*Lomatium dissectum*), threadstock milkvetch (*Astragalus filipes*), Hoods phlox  
45 (*Phlox hoodii*), and hoary aster (*Machaeranthera canescens*) are commonly occurring forbs.  
46 Some areas of former sagebrush habitat on INL have been converted to grassland due to  
47 wildfire.

1 The EREF property is located within both the 12g East Snake River Basalt Plain and the  
2 12e Upper Snake River Plain or Sagebrush Steppe ecoregions. Figure 3-28 shows the land  
3 cover types in the region around the EREF property, while Figure 3-29 provides cover types on  
4 the EREF property and immediate vicinity (Landscape Dynamics Lab, 1999). The property is  
5 transitional in that the western part of the property (Figure 3-30); 429 hectares (1060 acres) is  
6 sagebrush steppe whereas the remainder of the property managed as either nonirrigated  
7 pasture (882 hectares [2180 acres]) or as irrigated cropland (389 hectares [962 acres])  
8 (AES, 2010). Immediately to the east of the property, the land is intensively managed as  
9 agricultural lands and falls within the 12g East Snake River Basalt Plain ecoregion.

10  
11 As shown in Table 3-19, 34 plant species were identified within the sagebrush steppe  
12 community. The dominant species in this community on the EREF property are the shrubs  
13 Wyoming big sagebrush (approximately 16 percent areal cover), dwarf goldenbush (*Ericameria*  
14 *nana*) (approximately 17 percent areal cover), and Sandberg bluegrass (*Poa secunda*), a native  
15 perennial bunchgrass (approximately 11 percent areal cover) (AES, 2010). Only 8 of the  
16 14 commonly occurring species in high-quality INL sagebrush steppe habitats were found on  
17 the EREF property. The total areal cover of all plants, excluding mosses, is about 60 percent.  
18 The total areal cover of shrubs is about 34 percent, of grasses about 20 percent, and forbs  
19 about 6 percent. The sagebrush steppe community has been impacted for many years by  
20 grazing, resulting in soil disturbance and reduced cover of herbaceous species. Four of the  
21 34 species (12 percent) identified in this community were non-native, including cheatgrass, a  
22 highly invasive annual species which currently covers about 4 percent of the sagebrush steppe  
23 habitat. The density of Wyoming big sagebrush ranges from 6000 plants per hectare (2428 per  
24 acre) for short shrubs, those less than 40 centimeters (15.7 inches) in height, to 6900 plants per  
25 hectare (2792 per acre) for taller shrubs, those at least 40 centimeters (15.7 inches) in height.

26  
27 The other predominant plant community type at the EREF property is nonirrigated pasture,  
28 which represents the remnant of sagebrush steppe that was mechanically modified to develop  
29 improved grazing (AES, 2010). Modification included the removal of shrubs from most of the  
30 area composing this community; grasses, such as crested wheatgrass (*Agropyron cristatum*), a  
31 non-native perennial bunchgrass, were planted. The remaining shrubs are primarily located at  
32 rock outcrops. The dominant species in the pasture community on the property are crested  
33 wheatgrass (about 34 percent areal cover) and cheatgrass (approximately 12 percent areal  
34 cover) (AES, 2010), both non-native species. This community has much lower species diversity  
35 than the native sagebrush steppe community. A total of only 17 plant species have been  
36 identified within this community. The total areal cover of all plants is about 55 percent. The  
37 total areal cover of grasses is about 47.5 percent, of forbs about 7 percent, and shrubs about  
38 0.5 percent. Seven of the 17 species (41 percent) identified in this community are non-native.  
39 Bur buttercup (*Ranunculus testiculatus*), a non-native forb, occurs frequently in this community  
40 (about 5 percent areal cover). Other non-native species include alfalfa (*Medicago sativa*),  
41 tansymustard (*Descurainia sophia*), goats beard (*Tragopogon dubius*), and Canada thistle  
42 (*Cirsium arvense*), all at less than 1 percent cover.

### 43 44 **3.8.2 Wildlife**

45  
46 The wildlife species observed or determined to be present, based on evidence observed, on the  
47 EREF property are presented in Table 3-20. A total of 27 wildlife species were identified in the  
48 sagebrush steppe community. Sagebrush obligate species, which depend on sagebrush during



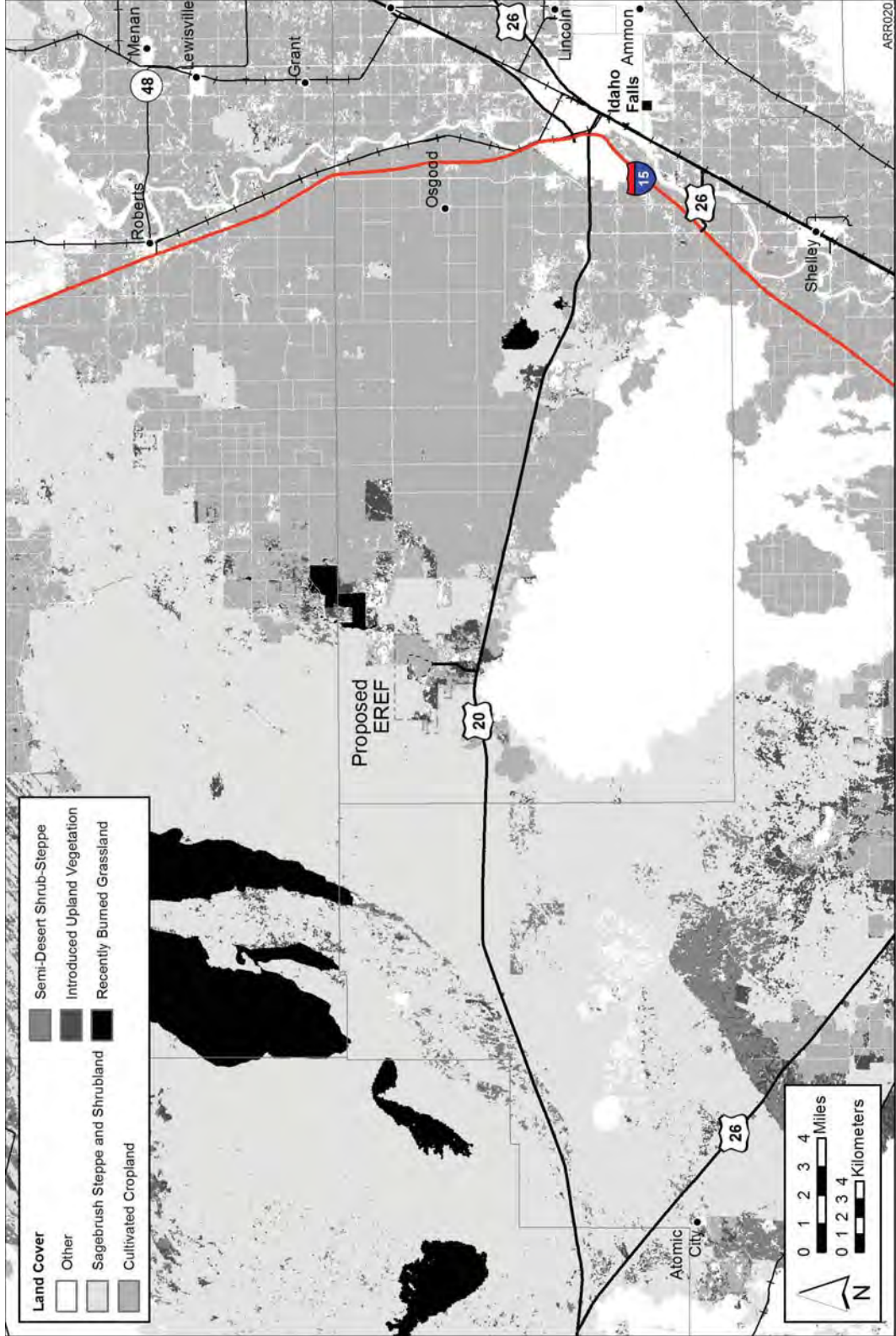


Figure 3-28 Land Cover Types of the Region (data from Landscape Dynamics Lab, 1999)

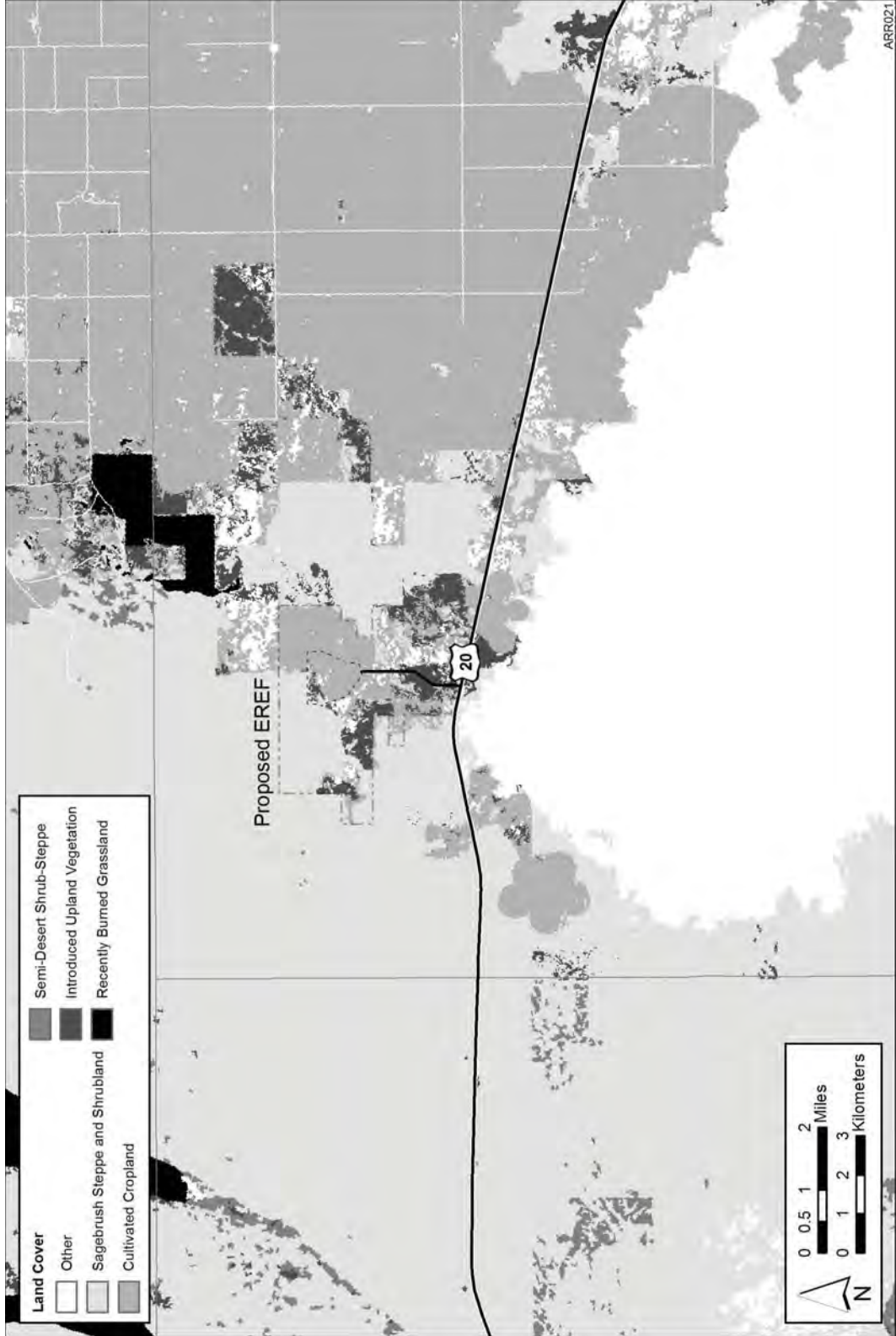


Figure 3-29 Land Cover Types of the Proposed EREF Property (data from Landscape Dynamics Lab, 1999)



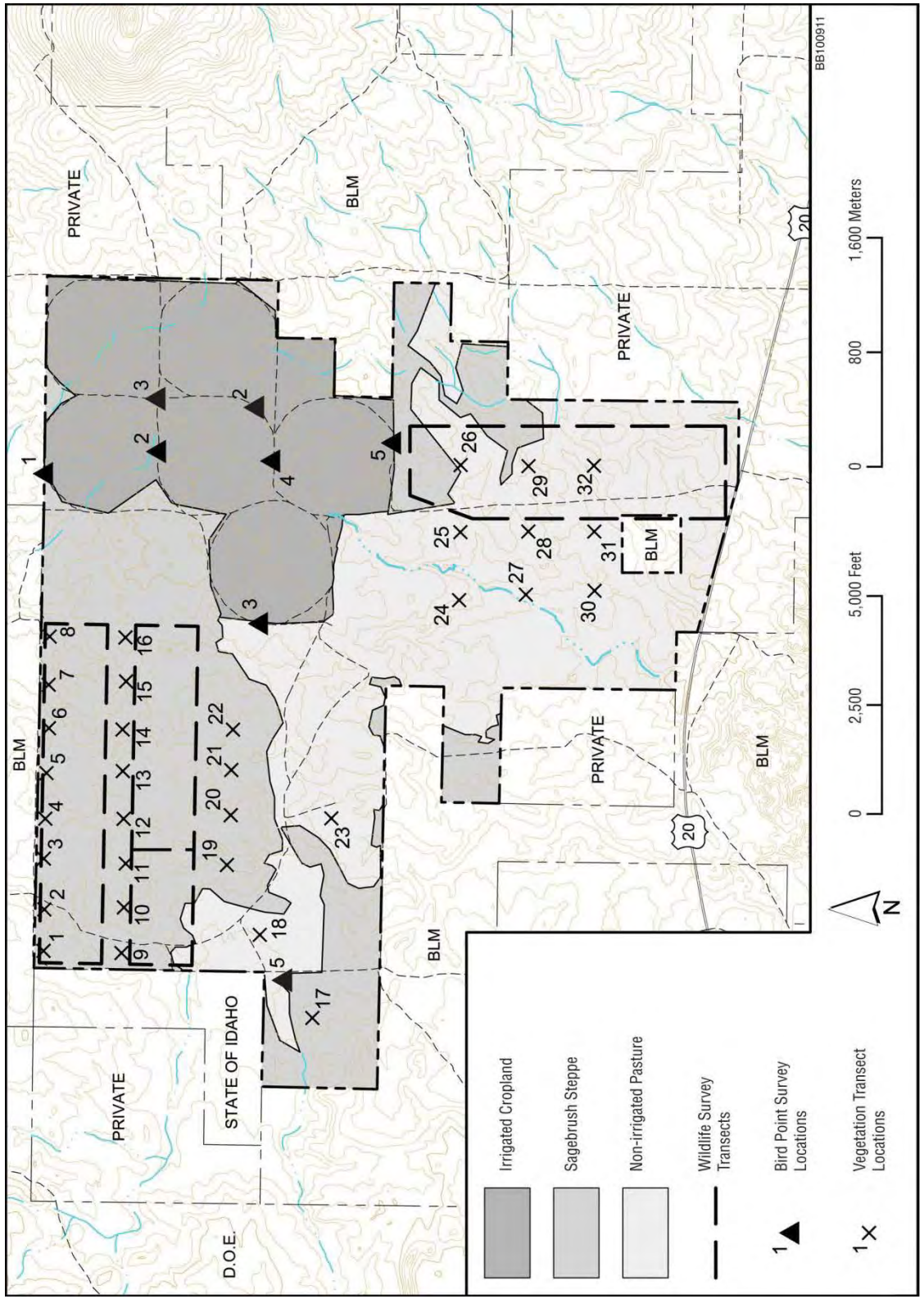


Figure 3-30 Vegetation Types of the Proposed EREF Property (AES, 2010)

**Table 3-19 Plant Species Identified on the Proposed EREF Property and Percent Areal Cover**

Scientific Name <sup>a</sup>	Common Name	Plant Community	
		Sagebrush Steppe	Nonirrigated Pasture
<b>Shrubs</b>			
<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	Wyoming big sagebrush	16.00	0.18
<i>Artemisia tripartita</i>	Threetip sagebrush	0.30	– <sup>b</sup>
<i>Atriplex nuttallii</i>	Nuttall's saltbush	0.10	–
<i>Ericameria nauseosa</i>	Rubber rabbitbrush	–	0.18
<i>Ericameria nana</i>	Dwarf goldenbush	17.00	0.18
<i>Krascheninnikovia lanata</i>	Winterfat	0.09	–
<b>Grasses</b>			
<i>Agropyron cristatum</i> *	Crested wheatgrass	0.60	33.60
<i>Bromus tectorum</i> *	Cheatgrass	4.00	11.90
<i>Elymus elymoides</i>	Squirreltail	0.09	–
<i>Elymus lanceolatus</i>	Thick-spike wheatgrass	1.00	–
<i>Hesperostipa comata</i>	Needle-and-thread	0.02	–
<i>Hordeum jubatum</i>	Foxtail barley	3.00	0.05
<i>Achnatherum hymenoides</i>	Indian ricegrass	0.04	–
<i>Poa secunda</i>	Sandberg bluegrass	11.00	1.90
<b>Forbs</b>			
<i>Agoseris glauca</i>	False dandelion	–	0.80
<i>Allium textile</i>	Textile onion	0.10	–
<i>Arabis lignifera</i>	Desert rockcress	0.20	–
<i>Astragalus curvicaupus</i>	Curvepod milkvetch	0.20	–
<i>Castilleja</i> sp.	Indian paintbrush	0.07	–
<i>Chenopodium leptophyllum</i>	Slimleaf goosefoot	0.04	–
<i>Cirsium arvense</i> *	Canada thistle	–	0.05
<i>Crepis acuminata</i>	Hawksbeard	0.10	–
<i>Cryptantha interrupta</i>	Bristly cryptantha	0.10	–
<i>Delphinium andersonii</i>	Anderson's larkspur	0.02	–
<i>Descurainia sophia</i> *	Tansymustard	1.00	0.14
<i>Erigeron pumilus</i>	Shaggy fleabane	0.40	0.41

**Table 3-19 Plant Species Identified on the Proposed EREF Property and Percent Areal Cover (Cont.)**

Scientific Name	Common Name	Plant Community	
		Sagebrush Steppe	Nonirrigated Pasture
<i>Lappula occidentalis</i>	Flatspine stickseed	0.50	0.05
<i>Lepidium</i> sp.	Pepperwort	0.09	–
<i>Lomatium dissectum</i>	Fernleaf biscuitroot	0.30	–
<i>Medicago sativa</i> <sup>a</sup>	Alfalfa	–	0.14
<i>Oenothera caespitosa</i>	Desert evening primrose	0.02	–
<i>Packera cana</i>	Woolly groundsel	0.02	0.05
<i>Phlox hoodii</i>	Hood's phlox	0.60	0.05
<i>Phlox longifolia</i>	Longleaf phlox	2.00	–
<i>Ranunculus testiculatus</i> <sup>a</sup>	Bur buttercup	0.02	5.00
<i>Schoenocrambe linifolia</i>	Flaxleaf plainsmustard	0.30	–
<i>Sphaeralcea munroana</i>	Orange globemallow	0.02	–
<i>Tragopogon dubius</i> <sup>a</sup>	Goat's beard	–	0.09
<b>Cacti</b>			
<i>Opuntia polyacantha</i>	Prickly pear	0.20	–

<sup>a</sup> Non-native species.

<sup>b</sup> Dash = not observed.

Source: AES, 2010; native status from USDA, 2010b.

1  
2 at least some portion of the year for survival, that are known to occur on the property include  
3 greater sage-grouse (*Centrocercus urophasianus*), sage thrasher (*Oreoscoptes montanus*),  
4 Brewer's sparrow (*Spizella breweri*), sage sparrow (*Amphispiza belli*), and pronghorn antelope  
5 (*Antilocapra americana*).  
6

7 Fifteen wildlife species were observed in the nonirrigated pasture habitat and 10 in the irrigated  
8 crops area. No small-mammal trapping was conducted on the property; however, small  
9 mammals common in similar habitats at INL include black-tailed jack rabbit (*Lepus californicus*),  
10 mountain cottontail (*Sylvilagus nattallii*), pygmy rabbit (*Brachylagus idahoensis*), Townsend's  
11 ground squirrel (*Spermophilus townsendii*), least chipmunk (*Tamias minimus*), Great Basin  
12 pocket mouse (*Perognathus parvus*), Ord's kangaroo rat (*Dipodomys ordii*), western harvest  
13 mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), bushy-tailed  
14 woodrat (*Neotoma cinerea*), and montane vole (*Microtus montanus*) (S.M. Stoller  
15 Corporation, 2001).  
16  
17



**Table 3-20 Wildlife Species Occurring on the Proposed EREF Property<sup>a</sup>**

Scientific Name	Common Name	Sagebrush Steppe	Nonirrigated Pasture	Irrigated Cropland
<b>Amphibians</b>				
<i>Ambystoma tigrinum</i>	Tiger salamander	– <sup>b</sup>	X	–
<b>Reptiles</b>				
<i>Phrynosoma douglassi</i>	Short-horned lizard	X	–	–
<b>Birds</b>				
<i>Ammodramus savannarum</i>	Grasshopper sparrow	X	–	–
<i>Amphispiza belli</i>	Sage sparrow	X	–	–
<i>Asio flammeus</i>	Short-eared owl	X	–	–
<i>Buteo jamaicensis</i>	Red-tailed hawk	–	–	–
<i>Centrocercus urophasianus</i>	Greater sage-grouse	X	–	–
<i>Charadrius vociferus</i>	Kildeer	–	X	–
<i>Circus cyaneus</i>	Northern harrier	X	X	X
<i>Corvus brachyrhynchos</i>	American crow	X	X	X
<i>Eremophila alpestris</i>	Horned lark	X	X	X
<i>Euphagus cyanocephalus</i>	Brewer's blackbird	X	–	–
<i>Falco mexicanus</i>	Prairie falcon	X	–	–
<i>Molothrus ater</i>	Brown-headed cowbird	X	X	–
<i>Numenius americanus</i>	Long-billed curlew	–	–	X
<i>Oreoscoptes montanus</i>	Sage thrasher	X	X	–
<i>Pica hudsonia</i>	Black-billed magpie	X	X	X
<i>Pooecetes gramineus</i>	Vesper sparrow	X	X	–
<i>Spizella breweri</i>	Brewer's sparrow	X	X	–
<i>Spizella passerina</i>	Chipping sparrow	–	–	–
<i>Sturnella neglecta</i>	Western meadowlark	X	X	X
<i>Zenaidura macroura</i>	Mourning dove	X	X	X
<b>Mammals</b>				
<i>Taxidea taxus</i>	Badger	X	–	–
<i>Canis latrans</i>	Coyote	X	X	–
<i>Antilocapra americana</i>	Pronghorn	X	X	–
<i>Microtus montanus</i>	Montane vole	X	–	–
<i>Odocoileus virginianus</i>	White-tailed deer	X	–	–
<i>Lepus californicus</i>	Black-tailed jack rabbit	X	–	–

**Table 3-20 Wildlife Species Occurring on the Proposed EREF Property<sup>a</sup> (Cont.)**

Scientific Name	Common Name	Sagebrush Steppe	Nonirrigated Pasture	Irrigated Cropland
<i>Spermophilus townsendii</i>	Townsend's ground squirrel	X	–	–
<i>Tamias minimus</i>	Least chipmunk	X	X	–
<i>Peromyscus maniculatus</i>	Deer mouse	X	–	–

<sup>a</sup> Species that were identified as present on the property based on visual observation, calls, or evidence of recent presence are indicated with an "X".

<sup>b</sup> Dash = not observed.

Source: AES, 2010; MWH, 2008a,b,c; MWH, 2009.

1  
2 Pronghorn have been observed on the EREF property. Pronghorn use the property throughout  
3 the year, and the property is located within important winter-spring pronghorn habitat. Mule  
4 deer (*Odocoileus hemionus*) and elk (*Cervus canadensis*) occur in the region during summer  
5 and winter and migrate through the INL area between summer and winter use areas  
6 (BLM/DOE, 2004). There are no indications that mule deer, elk, or pronghorn populations are  
7 declining in the region; elk and pronghorn populations may be slightly increasing (IDFG, 2009b).

8  
9 **3.8.3 Rare, Threatened, and Endangered Species**

10  
11 No Federally listed threatened or endangered species are known to occur, or are expected to  
12 occur, on the EREF property (FWS, 2009a), and none were identified on the property during  
13 field surveys. The following Federally listed species are known to occur in Bonneville County  
14 and adjacent Jefferson and Bingham Counties, and are found in stream, forest, wetland, and  
15 riparian habitats: the Utah valvata snail (*Valvata utahensis*), endangered; Canada lynx (*Lynx*  
16 *canadensis*), threatened; Ute ladies'-tresses (*Spiranthes diluvialis*), threatened; grizzly bear  
17 (*Ursus arctos*), threatened; and yellow-billed cuckoo (*Coccyzus americanus*), a candidate for  
18 listing (FWS, 2009b). None of their habitat types are found on the EREF property nor within an  
19 8-kilometer (5-mile) radius of the property.

20  
21 The Utah valvata snail is a freshwater aquatic snail that occurs in the mainstem of the Snake  
22 River (FWS, 2010a). The Snake River is about 32 kilometers (20 miles) from the property, and  
23 there are no freshwater habitats on or in the vicinity of the property. Therefore, this species  
24 would not occur on or near the property.

25  
26 The Canada lynx (*Lynx canadensis*) is typically associated with forested habitats and may use  
27 riparian habitat along rivers as travel corridors. Ute ladies'-tresses (*Spiranthes diluvialis*), a  
28 plant primarily of wetland and riparian habitats, occurs in the Snake River floodplain  
29 (IDFG, 2009a). The yellow-billed cuckoo (*Coccyzus americanus*) is typically associated with  
30 riparian woodlands and shrubs and occurs along the Snake River. The grizzly bear occurs in a  
31 variety of habitats within portions of the Greater Yellowstone Area (FWS, 2010b).

32

1 The bald eagle (*Haliaeetus leucocephalus*) is listed as a threatened species by the State of  
2 Idaho, but is no longer a Federally listed species. It nests in trees along the Snake River  
3 northeast and southeast of the proposed EREF site and winters near open water (IDFG, 2005;  
4 FWS, 2007). Foraging is generally near rivers, lakes, or other water bodies. Bald eagles do not  
5 nest in the vicinity of the proposed EREF, and winter habitat does not occur in the vicinity.  
6

7 Species of concern that were observed on the EREF property include the long-billed curlew  
8 (*Numenius americanus*), ranked as an imperiled breeding population in the State and BLM  
9 watch list; Brewer's sparrow (*Spizella breweri*), ranked as a vulnerable breeding population in  
10 the State and BLM regional/State imperiled; grasshopper sparrow (*Ammodramus savannarum*),  
11 ranked as an imperiled breeding population in the State and BLM watch list, which are all  
12 species of conservation concern (FWS, 2008) and BLM species of special concern.  
13

14 Greater sage-grouse (*Centrocercus urophasianus*) was added to the Federal list of candidate  
15 species by the U.S. Fish and Wildlife Service (FWS) on March 5, 2010. The FWS determined  
16 that listing the sage-grouse as a protected species under the *Endangered Species Act* was  
17 warranted but precluded by the need to list higher priority species. Sage-grouse is also a  
18 species of conservation concern in Idaho and ranked as imperiled in the State and BLM  
19 rangewide/globally imperiled. The proposed EREF property appears to be located within the  
20 annual range of a local sage-grouse population, and sage-grouse evidently use the site. Sage-  
21 grouse were observed, and male sage-grouse were heard just north of the EREF property  
22 during surveys in 2008 (MWH, 2008a), and evidence of the presence of sage-grouse was  
23 observed on the property in 2008 and 2009 (MWH, 2008b, 2009). In June 2008, sage-grouse  
24 pellets (droppings), feathers, and a roost used by sage-grouse were found in sagebrush habitat  
25 on the property (MWH, 2008b). In January 2009, sage-grouse tracks were found in the  
26 sagebrush habitat on the property and the irrigated crops area of the property; in April 2009,  
27 sage-grouse feathers were found at three locations in sagebrush habitat on the property (MWH,  
28 2009). In April 2010, old sage-grouse pellets were found in sagebrush habitat on the property  
29 (North Wind, 2010). No greater sage-grouse leks (breeding areas) were found during surveys  
30 of the proposed property on May 6–7, 2008 (MWH, 2008a) and April 28–29, 2010 (North  
31 Wind, 2010). Recommended survey dates are early March to early May (Connelly et al., 2003);  
32 specifically, lek surveys should be conducted March 25 through April 30 for low elevation areas  
33 and April 5 through May 10 for higher elevations (ISAC, 2006). At approximately 5200 feet  
34 (1600 meters) MSL, the EREF property could be considered a high elevation site. The nearest  
35 known breeding ground (lek) is 5.6 kilometers (3.5 miles) from the EREF site, and numerous  
36 leks are located within 16 kilometers (10 miles) (IDFG, 2009b). Key sage-grouse habitat occurs  
37 in the vicinity of the EREF property (IDFG, 2009b; ISAC, 2006).  
38

39 Sage-grouse have experienced long-term declines throughout their range, which includes much  
40 of the western United States. These declines are associated in large part with the loss and  
41 degradation of sagebrush habitat. Sagebrush is an important component of sage-grouse  
42 breeding, nesting, and winter habitat. The Idaho populations of sage-grouse declined at an  
43 average rate of 3.0 percent per year from 1965 to 1984, but declines from 1985 to 2003  
44 averaged only 0.1 percent per year (Connelly et al., 2004).  
45

46 The proposed EREF property is located within the Upper Snake Local Working Group Planning  
47 Area, which is within sage-grouse Management Zone IV. Since 1996, sage-grouse populations  
48 in the Upper Snake Local Working Group Planning Area appear to be stable (USSLWG, 2009).

1 Male lek attendance was up slightly in 2009 from 2008. In the Upper Snake Planning Area, the  
2 average males per lek in 2009 was 15, a drop from 19 in 2008 and 24 in 2007. Total males  
3 counted on leks in the Upper Snake Planning Area (on leks counted each year) was 1465 in  
4 2009, 1366 in 2008, and 2052 in 2007.

5  
6 Productivity measured as chicks per hen (chicks alive in September and October) is strongly  
7 influenced by weather. Idaho sage-grouse productivity in 2008 was 1.48 chicks per hen, which  
8 was slightly lower than the previous 5-year average of 1.93 (ISACTAT, 2010). However, in  
9 2009, productivity was 2.0, slightly higher than previous 5-year average of 1.88  
10 (ISACTAT, 2010). In the Upper Snake Planning Area, productivity is increasing with a chick/hen  
11 ratio of 2.17 in 2009, 1.84 in 2008, and 1.16 in 2007 (ISACTAT, 2010). A chicks/hen ratio of  
12 2.25 or more generally results in a stable to increasing population.

13  
14 The major threats to sage-grouse in Idaho are the loss, degradation, and fragmentation of  
15 sagebrush habitat (Connelly et al., 2004). Alteration of historical fire regimes, conversion of  
16 land to farming or intensive forage production for livestock, water developments, herbicide and  
17 pesticide use, establishment of invasive species, urbanization, energy development, mineral  
18 extraction, and recreation are all factors that contribute to sagebrush habitat degradation  
19 (Connelly et al., 2004). Restoration of disturbed areas should include sagebrush, native forbs  
20 (especially legumes), and native bunchgrasses to provide suitable breeding habitat for sage-  
21 grouse (USSLWG, 2009). Fences may be a source of sage-grouse mortality unless visibility is  
22 increased by flagging or other means (USSLWG, 2009). Noxious weeds invade sagebrush  
23 steppe plant communities and displace desirable species, change fire frequencies, and reduce  
24 the value of the habitat for sage-grouse (USSLWG, 2009).

25  
26 Many sage-grouse populations in Idaho are migratory. Sage-grouse occur year-round on the  
27 INL site and migrate between leks, nesting areas, late brood-rearing habitat (June to early  
28 November), and winter habitat (BLM/DOE, 2004). Nesting sites have been known to be up to  
29 18 kilometers (11 miles) from leks. Important characteristics for winter habitat include  
30 topographic diversity and a diversity of sagebrush heights. DOE, the BLM, and the Idaho  
31 Department of Fish and Game all participate in and follow the Idaho Sage-Grouse Advisory  
32 Committee's *Conservation Plan for the Greater Sage-Grouse in Idaho* (ISAC, 2006) and will  
33 continue to follow this document.

34  
35 Species of conservation concern that occur in the region and are likely to occur on the EREF  
36 property include Townsend's big-eared bat (*Corynorhinus townsendii*), ranked as vulnerable in  
37 the State and BLM regional/State imperiled. Lava tube caves approximately 8 kilometers  
38 (5 miles) from the property are used by Townsend's big-eared bat as roosts and hibernacula  
39 (IDFG, 2009c). The bats likely forage for insects above the sagebrush steppe habitat. The  
40 ferruginous hawk (*Buteo regalis*), a migratory species, is ranked as a vulnerable breeding  
41 population in the State and BLM regional/State imperiled. Ferruginous hawks, including a nest,  
42 have been observed within 8 kilometers (5 miles) of the proposed site (IDFG, 2009c). The prey  
43 species in western shrubsteppe habitats primarily include black-tailed jackrabbit, ground  
44 squirrels, and pocket gophers. Ferruginous hawk nests tend to be located on the ground or in  
45 relatively isolated trees (Dechant et al., 1999). The pygmy rabbit (*Brachylagus idahoensis*) is  
46 ranked as imperiled in the State and BLM rangewide/globally imperiled. This burrowing species  
47 has been frequently observed on the INL site (S.M. Stoller Corporation, 2001). The sharp-tailed  
48 grouse (*Tympanuchus phasianellus*) is known to occur in the vicinity of the proposed EREF site

1 (IDFG, 2010) and occupies shrub and grass habitats (IDFG, 2005). The sharp-tailed grouse  
2 does not occur throughout the Upper Snake River Plain, and its distribution in the proposed  
3 EREF site area is somewhat limited (IDFG, 2005).

#### 4 5 **3.8.4 Wetlands**

6  
7 Wetlands are “areas that are inundated or saturated by surface or ground water at a frequency  
8 and duration sufficient to support, and that under normal circumstances do support, a  
9 prevalence of vegetation typically adapted for life in saturated soil conditions” (USACE, 1987).  
10 No wetlands occur on or adjacent to the EREF property (FWS, undated; Joyner, 2008). No  
11 aquatic habitats, such as streams, rivers, lakes, or ponds, are present on or adjacent to the  
12 property. Surface water on and near the property consists of intermittent and ephemeral  
13 drainages that carry flows following storms and typically dissipate due to infiltration and  
14 evapotranspiration (USGS, 1964; NRCS, 2009). A drainage in the southwestern corner of the  
15 property may occasionally convey surface water off the property. A small impoundment on this  
16 drainage occasionally contains surface water following storms. Small wet areas in the irrigated  
17 cropland and near the potato shed occasionally receive water from agricultural operations and  
18 support such species as cattail (*Typha* sp.) and spikerush (*Eleocharis* sp.), as well as providing  
19 potential breeding areas for the tiger salamander (*Ambystoma trigrinum*). Permanent surface  
20 waters nearest to the property are the Snake River, about 32 kilometers (20 miles) to the east,  
21 Mud Lake and Market Lake, about 32 kilometers (20 miles) to the northeast, and the Big Lost  
22 River, about 32 kilometers (20 miles) to the west.

#### 23 24 **3.8.5 Environmentally Sensitive Areas**

25  
26 Three State wildlife management areas are located about 32 kilometers (20 miles) north-  
27 northeast of the EREF property. Market Lake State Wildlife Management Area is managed  
28 primarily to provide habitat for waterfowl; the North Lake State Wildlife Management Area and  
29 Mud Lake Wildlife Management Area are managed for fish and wildlife resources. Hell’s Half  
30 Acre WSA (BLM), immediately south of US 20, is a 26,790-hectare (66,200-acre) area of lava  
31 flows with sparse vegetation (BLM, 2008). Camas National Wildlife Refuge, about 32 kilometers  
32 (20 miles) north, includes lakes, ponds, and marshes.

#### 33 34 **3.9 Noise**

35  
36 This section describes the existing conditions at the proposed EREF site with respect to  
37 anthropogenic sources of noise, characterizes the geography and land cover with respect to  
38 noise propagation and attenuation, and identifies receptors that may be impacted by noise  
39 generated during preconstruction, construction, operation, or decommissioning of the proposed  
40 EREF. Existing noise regulatory controls and their respective enforcement authorities are also  
41 discussed.

42  
43 Sound is a physical phenomenon and form of energy that can be described and measured and  
44 represented with precise mathematical expressions. Noise, on the other hand, is defined  
45 generally as any unwanted sound. Recognition of sound is based on the receptor’s objective  
46 and reproducible response to sound’s primary physical attributes: intensity (perceived by a  
47 receptor as loudness), frequency (perceived as pitch), frequency distribution and variation over  
48 time, and duration (continuous, sporadic [rhythmic], or impulsive). Perception of sound,



1 however, is subjective and circumstantial. Sounds that are soothing to some are annoying to  
2 others, and sounds barely noticed and generally ignored in one circumstance may be  
3 considered highly objectionable in another. Sound levels that are acceptable during daytime  
4 hours are often unacceptable during nighttime hours.  
5

### 6 **3.9.1 Expected Sound Propagation Characteristics at the Proposed EREF Site**

7

8 Sound propagation follows the inverse square law: the intensity of a sound wave decreases  
9 inversely with the square of the distance between the source and the receptor. Thus, doubling  
10 the distance between a receptor and a sound source reduces the intensity of the sound to one-  
11 fourth of its initial value, and tripling the distance results in one-ninth the original intensity, etc.  
12

13 Throughout much of the continental United States, land cover results in attenuation of sound  
14 originating at or near ground level at a rate of 6 decibels for every doubling of distance between  
15 source and receptor. At a typical semiarid steppe with sparse vegetation and exposed, hard  
16 surface soils or rock, the ground surface would be expected to act primarily as a reflective  
17 surface rather than an absorptive surface, resulting in minimal attenuation of sound as it  
18 propagates from its source. However, the land surface composition around the proposed EREF  
19 does not represent a typical semiarid desert steppe. Native vegetation, primarily sage and  
20 cacti, exists in natural areas. However, crested wheatgrass, which had been introduced into the  
21 area some years ago, has spread throughout the area to a great extent, and, with the exception  
22 of small areas of basalt outcropping, the entire land surface of natural areas is now covered with  
23 a natural or introduced vegetative cover throughout the growing season. Other land areas  
24 surrounding the proposed EREF site that are currently in agricultural cultivation for potatoes or  
25 barley and that would continue to be used for those purposes after the proposed EREF  
26 becomes operational are also nearly fully covered with vegetation during much of the crop-  
27 growing cycle. Thus, given these circumstances and current and future surrounding land uses,  
28 it is reasonable to expect that the ground surface would be relatively sound-absorptive and that  
29 SPL attenuations would be at the average of 6 decibels with every doubling of distance from the  
30 source.  
31

### 32 **3.9.2 Existing Sound Sources and Potential Receptors at the Proposed EREF Property**

33

34 Current activities at the proposed EREF property and on the surrounding land parcels are  
35 primarily agricultural. Noise sources related to current land use include an irrigation pump  
36 located in the approximate center of the site, the only identified significant anthropogenic point  
37 source, and machinery and equipment used seasonally to prepare the fields and to plant and  
38 harvest the crops. Truck transport of harvested crops to area processing plants represents  
39 another seasonal source.  
40

41 The southern border of the proposed EREF property is defined by US 20, the only major  
42 transportation corridor in the immediate vicinity of the site. In addition to being used for  
43 commerce, US 20 is currently used by many employees of INL, located immediately west of the  
44 proposed EREF property, to commute between the laboratory and their homes in Idaho Falls. It  
45 is expected that US 20 will also be the primary route for the majority of employees of the  
46 proposed EREF once it becomes operational. Section 3.10 provides additional information  
47 about existing traffic patterns for US 20. No other significant anthropogenic sound sources exist  
48 in the immediate vicinity of the proposed EREF site.  
49

1 The nearest human receptors are farm workers who may periodically be in agricultural fields  
2 bordering the proposed property (presumably only during daylight hours), hikers who may  
3 frequent a trail located on the BLM WSA about 0.5 kilometer (0.3 mile) southwest of the  
4 proposed property, and residents; the nearest residence was estimated to be located  
5 7.7 kilometers (4.8 miles) east of the site on a parcel bordering US 20. No sensitive human  
6 receptors were identified. Individuals traveling on US 20 are not considered to be human  
7 receptors because of the short time during which they would be within a critical distance of any  
8 EREF sound source. The nearest community was identified as Idaho Falls, approximately  
9 32 kilometers (20 miles) east of the site. Archeological sites at the Wasden Complex were  
10 identified at a distance of 1 kilometer (0.6 mile) from the proposed property. It is also presumed  
11 that indigenous wildlife would use the site and the vicinity throughout construction and operation  
12 and that cattle grazing would continue to occur on adjacent land parcels that are not involved in  
13 crop production. Cattle grazing may also be allowed on fallow portions of the proposed EREF  
14 property (excluding the industrial portion of the site) once construction is completed. AES  
15 identified one irrigation pump as the only anthropogenic point source of any significance and  
16 identified traffic on US 20 (which borders the site on its south boundary) as the only  
17 anthropogenic line source of note within the vicinity of the proposed site. Once construction of  
18 the proposed facility starts, the irrigation pump's operation will be discontinued. However, that  
19 same groundwater source is likely to be fitted with a different pump to provide water for  
20 construction-related activities.

21

### 22 **3.9.3 Noise Regulatory Controls**

23

24 Regulations addressing sound, or more precisely what society considers noise, exist for noise  
25 sources that originate or propagate on or above the ground surface. Federal noise standards  
26 have been established under the *Noise Control Act of 1972* for transportation and construction  
27 activities as well as for a variety of products. The *Noise Control Act* and subsequent Federal  
28 legislation (*Quiet Communities Act of 1978*, 42 U.S.C. 2901-4918) delegate the authority to  
29 regulate noise to State and local governments. Although there has been no formal noise control  
30 program functional at the Federal level since 1981, Federal noise standards have served as the  
31 basis for State and local regulations and ordinances addressing noise. Such State and local  
32 controls initially focused on construction or industrial noise but have evolved to also include  
33 noise control strategies in building codes to protect occupants from both exterior noise and  
34 noise generated within the structure. State and local regulations are typically enforced at the  
35 municipal or county level under broadly written nuisance statutes.

36

37 In addition to technical standards, the EPA has also published numerous guidance manuals for  
38 conducting community noise surveys, establishing acceptable levels of noise control at the  
39 community level, and enforcing those noise limits (e.g., EPA, 1980). Because of the increased  
40 sensitivity of most individuals to sound at night, a 10-decibel weighting factor is often added to  
41 the measured nighttime sound level to establish an equivalent sound level, or  $L_{eq}$ , that is then  
42 compared with the established standards. A day-night maximum average sound level  
43 (represented as  $L_{dn}$  or DNL) of 55 A-weighted decibels has been established as sufficient to  
44 protect the public from the effects of broadband environmental noise in quiet settings and  
45 residential neighborhoods (EPA, 1974). EPA guidelines also recommend that the  $L_{eq}$  (a sound  
46 level maintained continuously over a 24-hour period) be limited to 70 dBA or less over a 40-year  
47 period to protect the general population against hearing loss from nonimpulsive noise.

48

1 In addition to the EPA, other Federal agencies have issued circumstantially specific noise  
2 standards. The Federal Aviation Administration, in conjunction with the Federal Interagency  
3 Committee on Urban Noise, has issued land-use compatibility guidelines indicating that a yearly  
4  $L_{dn}$  of less than 65 A-weighted decibels is compatible with residential land uses and that, if a  
5 community determines it is necessary, levels up to 75 dBA may be compatible with residential  
6 uses and transient lodgings if such structures also incorporate noise-reduction construction  
7 technologies (see 14 CFR Part 150, Appendix A). The U.S. Department of Housing and Urban  
8 Development (HUD) has also published noise guidance: levels of 65  $L_{dn}$  or less (measured at  
9 the outside of an occupied residence) are acceptable under all circumstances, levels between  
10 65 and 75 dBA are normally unacceptable but could become acceptable with the introduction of  
11 appropriate sound attenuation measures, and levels above 75 dBA are always unacceptable  
12 (Table 3-21). HUD has also promulgated standards (see 24 CFR Part 51, Subpart B) for  
13 residential noise that apply only to activities for which HUD provides assistance.<sup>15</sup> Finally,  
14 regulations governing the amount of noise to which workers can be exposed in the workplace  
15 are promulgated and enforced by the Occupational Safety and Health Administration (OSHA)  
16 (see 29 CFR Part 1910, Subpart G).

17  
18 Noise limits in the ordinances are generally applied at the exterior of the nearest resident or  
19 sensitive receptor, such as a school or hospital, within a minimum distance, typically less than  
20 2 kilometers (less than 1 mile). Limits on broadband noise in the various ordinances range from  
21 45 to 65 dBA, with levels of about 50 dBA being the most frequently cited. Separate limits on  
22 low-frequency noises, which range up to 75 decibels, are included in many of the ordinances.  
23 A number of penalties, usually 5 dBA, are applied to these basic values to reduce impacts from  
24 annoyances such as evening operations, steady pure tones, or repetitive impulse sounds.  
25 There are no quantitative noise-limit regulations at the city, county, or State levels in Idaho;  
26 however, complaints about obtrusive noise that are made to local law enforcement authorities  
27 can be addressed under general nuisance ordinances.

### 28 29 **3.9.4 Noise Analyses Performed for the Proposed EREF**

30  
31 Measurements of extant sound levels at various locations along the proposed property  
32 boundary of the proposed EREF site were performed by AES (AES, 2010). Background noise  
33 levels were established by using an A-weighted sound meter and data collected over six  
34 24-hour periods at six locations from June 1 through 7, 2008 (see Figure 3-31). Data were  
35 collected and managed in accordance with applicable American Society of Testing and  
36 Materials (ASTM) standards (see ASTM Standard E-1686-03; ASTM, 2003). Average  
37 background noise levels ranged from 30.4 to 78.2 dBA; they are displayed in Table 3-22. The  
38 majority of measured levels met both the HUD and EPA standards. Levels exceeding 50 dBA  
39 were measured near US 20 during periods of heavy truck traffic, within the vicinity of the  
40 irrigation pump, and in the northeast corner of the proposed property during a windy (more than  
41 40 kilometers or 25 miles per hour) period. As a contextual reference, Figure 3-32 presents  
42 levels representative of common everyday sounds.

43  
44 Measurements of background noise levels conducted by AES are consistent with previously  
45 published measurements and estimates for the nearby INL (DOE, 2005) and are therefore  
46 considered to be an accurate representation of extant conditions at the site. For the general

---

<sup>15</sup> For additional details, consult the HUD Web site: <http://www.hudnoise.com/>.

**Table 3-21 HUD Land Use Compatibility Guidelines**

Land Use Category	Day-Night Sound Pressure Level or L <sub>dn</sub> (dBA)			
	Clearly Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential	<60	60–65	65–75	>75
Livestock farming	<60	60–75	75–80	>80
Office buildings	<65	65–75	75–80	>80
Wholesale, industrial, manufacturing, and utilities	<70	70–80	80–85	>85

Source: HUD, 2009.

1  
2 area surrounding the INL site (which would include the proposed EREF property), the county-  
3 wide L<sub>dn</sub>, based on population density, was estimated to be the highest – at 39 dBA – in  
4 Bonneville County. It was estimated to be 35 dBA in Bingham and Jefferson Counties, a level  
5 representative of typical rural areas, and 30 dBA in Butte County, a level representative of the  
6 natural background noise level of a wilderness area. Noise measurement data obtained from  
7 locations within 15 meters (50 feet) of US 20 showed traffic noise ranged from 64 to 86 dBA,  
8 with buses identified as the primary source, contributing from 71 to 80 dBA.

9

10 **3.10 Transportation**

11  
12 This section describes the existing transportation infrastructure at and in the region of the  
13 proposed EREF site. The proposed EREF site is served directly and exclusively by road.  
14 There are no plans for rail access to the site. AES has stated that local roads and highways  
15 would be the sole means for conveying workers and materials to and from the site and region  
16 (AES, 2010). Nearby rail and air transportation routes also serve the region, but there are no  
17 viable water transportation routes. Figure 1-1 shows transportation routes near the proposed  
18 EREF site.

19

20 **3.10.1 Roads**

21  
22 The site lies immediately north of US 20, approximately 32 kilometers (20 miles) west of Idaho  
23 Falls (and the junction of US 20 and I-15). US 20 is predominantly a two-lane highway  
24 traversing east-west between Idaho Falls to the east and the junction with US 26 to the  
25 northwest of Atomic City. Access to the proposed EREF site would be from one or two planned  
26 access roads to US 20. Control and public access to the access road(s) have yet to be  
27 specified. All traffic traveling to and from the proposed EREF (construction workers, employees,  
28 and shipments) would use one of these access roads (AES, 2010).

29

30 US 20 intersects I-15 at Idaho Falls, and I-15 and US 20 (north of Idaho Falls) would serve as  
31 the main routes between the proposed EREF (via US 20 West) and population centers to the  
32 north and south of Idaho Falls. I-15 is the major north-south artery in the region and would  
33 serve as the primary route for all incoming and outgoing truck shipments. The nearest interstate  
34 access to the west is I-84, approximately 296 kilometers (184 miles) away at its closest point by  
35 way of US 20. Idaho Falls is also served by US 26 and US 91.



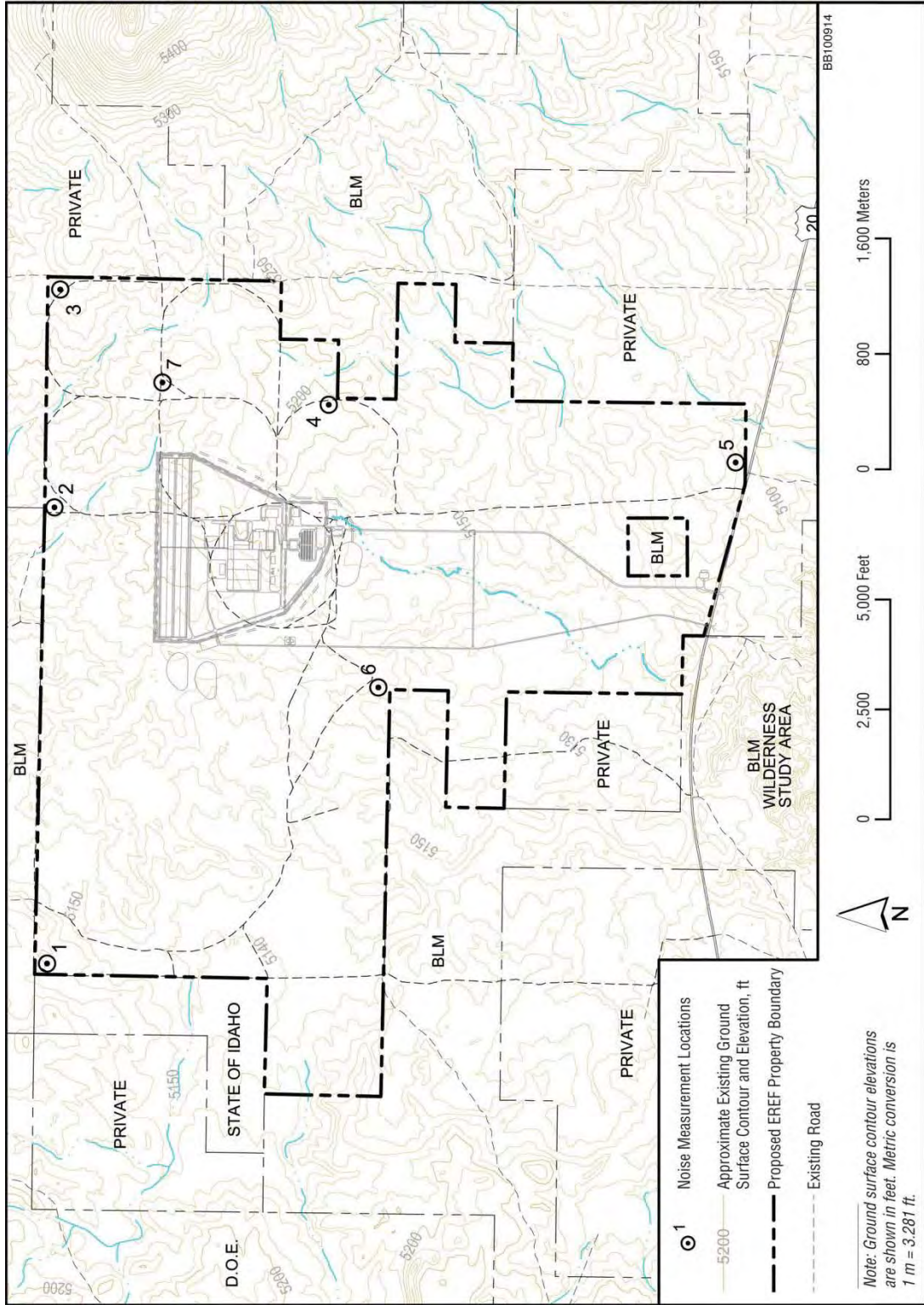


Figure 3-31 Noise Measurement Locations at the Proposed EREF Property (modified from AES, 2010)

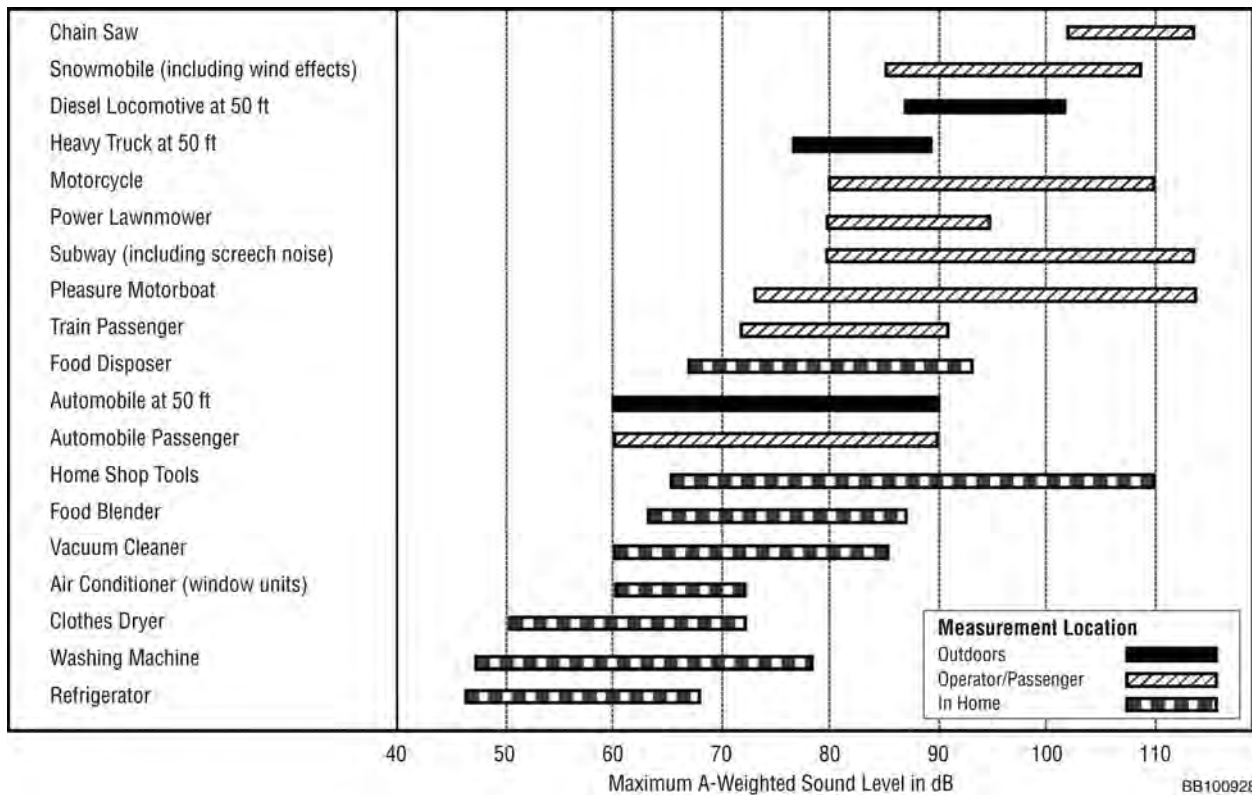


**Table 3-22 Extant Sound Levels at the Proposed EREF Property as Measured by AES**

Measurement Location	Location Description	Average Sound Level (L <sub>eq</sub> )
Location 1	Northwest corner of proposed property	30.4 dBA
Location 2	North-central boundary of proposed property	39.8 dBA
Location 3	Northeast corner of proposed property (high wind conditions)	54.7 dBA
Location 4	Southeast corner nearest to proposed facility	37.1 dBA
Location 5	South boundary of proposed property next to US 20	57.5 dBA
Location 6	Southwest corner nearest to proposed facility	31.1 dBA
Location 7	Irrigation well pump in northeast portion of proposed property	78.2 dBA

Source: AES, 2010.

1



2

**Figure 3-32 Sound Pressure Levels (dB) of Common Sources (All data reflect sound propagation in air and imply a human receptor.) (EPA, 1978)**

3  
4  
5  
6 As shown in Table 3-23, US 20 has an average daily traffic volume of 2210 vehicles in the  
7 vicinity of the proposed EREF site (mean monthly average from July 2008 to June 2009).  
8 A significant portion of this traffic is morning and afternoon commuting to and from INL  
9 (NRC, 2009; ITD, 2010e). This volume could increase if the INL park-and-ride bus system is

1 discontinued.<sup>16</sup> The speed limit on US 20 in the vicinity of the proposed EREF site is  
2 104.6 kilometers per hour (65 miles per hour); the average vehicle speed for all of 2009 was  
3 103.8 kilometers per hour (64.5 miles per hour) (ITD, 2010b).

4  
5 The relationship between the current/anticipated traffic volume on US 20 (in the vicinity of the  
6 proposed EREF site) and the road's design capacity is unknown, because the road was  
7 established before it became a major commuter route to INL. The Idaho Transportation  
8 Department (ITD) notes that the road was not designed for a specific level of service (LOS)<sup>17</sup>  
9 and is not engineered to accommodate the current traffic flow. However, the LOS is considered  
10 high for a two-lane road (NRC, 2009). Based on average traffic volumes, average traffic  
11 speeds, and the highly directional nature of peak flow (largely consisting of INL commuters), the  
12 LOS on US 20 is estimated to be high density but stable flow during peak periods and free flow  
13 at all other times (AASHTO, 1994; ITD, 2010b,c,e).

14  
15 There is a local perception that US 20 between Idaho Falls and INL is unsafe (likely due to a  
16 history of high-profile accidents) and would get worse if the proposed EREF is licensed  
17 (NRC, 2009). However, ITD notes that the accident rate on the affected stretch of US 20 is  
18 actually lower than the statewide average and base area rates (ITD, 2005; NRC, 2009). In  
19 2005, ITD performed an internal study of potential safety improvements for US 20 (i.e., widening  
20 and/or passing lanes) in the vicinity of the proposed EREF site (ITD, 2005, 2010c). At that time,  
21 funding was not available to implement the studied improvements (primarily selective passing  
22 lanes), and ITD does not anticipate a funding allocation in the foreseeable future (NRC, 2009).

23  
24 According to ITD, US 20 is overbuilt (i.e., engineered to accommodate a higher LOS than  
25 presented by current traffic levels) to a distance of 8 kilometers (5 miles) west of Idaho Falls to  
26 accommodate growth at INL that was anticipated but did not materialize (NRC, 2009). This  
27 likely improves capacity and LOS for approximately 25 percent of the segment between Idaho  
28 Falls and the proposed EREF site. There are currently no plans to expand US 20 between  
29 Idaho Falls and the proposed EREF site, and no large projects are anticipated near the  
30 proposed site (NRC, 2009). However, the 18-mile stretch of US 20 from Idaho Falls to the  
31 Bonneville-Butte county line (west of the proposed EREF site) was resurfaced during the  
32 summer of 2010. ITD also noted that the need to upgrade or rebuild the interchange of US 20  
33 and I-15 (through which all shipping to and from the proposed EREF would flow) may be  
34 accelerated by increased traffic from the proposed EREF, since the geometry of the interchange  
35 is not favorable and the right-of-way is limited (NRC, 2009). Currently, there are no funded  
36 plans for this work.

37  
38 US 20 between Idaho Falls and the proposed EREF site is subject to chronic weather-related  
39 closure, primarily in winter months because of unfavorable road conditions, snow drifts, and low  
40 visibility (NRC, 2009; ITD, 2010d). The section of US 20 subject to closure extends from  
41 approximately 5 miles west of Idaho Falls to the junction of US 20 and US 26 near INL

---

<sup>16</sup> During a consultation meeting in June 2009, the Idaho Transportation Department noted that INL has discussed discontinuing the bus system as a cost-saving measure, but that no decisions had been made (NRC, 2009).

<sup>17</sup> LOS is a measure used by traffic engineers to assess the service quality of road infrastructure, taking into account factors such as traffic volume, road capacity, traffic speed, freedom to pass, and driver comfort and convenience.

**Table 3-23 Annual Average Daily Traffic (AADT) on Major Roads near the Proposed EREF Site**

Road	Direction	Location	AADT
US 20	E-W	At US 26 near Atomic City	1900
US 20	E-W	Near proposed EREF site	2210 <sup>a</sup>
US 20	E-W	Idaho Falls west city limit	9900
US 20	E-W	Immediately east of I-15	29,733 <sup>a</sup>
US 20	N-S	Idaho Falls north city limit	16,000
I-15	N-S	North of Idaho Falls	5400
I-15	N-S	At US 20	18,000
I-15	N-S	South of Idaho Falls (65th Street)	20,000
US 26	E-W	Atomic City	1100

<sup>a</sup> Average July 2008–June 2009. Source: ITD, 2009b.

Source: ITD, 2009a.

1  
2 (mileposts 264 to 301), encompassing the proposed EREF site. These closure points are the  
3 most convenient for ITD, include the stretches of US 20 that are the most problematic, and  
4 include few access points via intersecting county roads. Road closures typically last from  
5 6 hours to 1 day, with the maximum closure occurring only once or twice in the last 5 years.  
6 About five closures of US 20 are anticipated in a typical snow year. ITD is currently working  
7 with INL to install snow fencing to the west of the proposed EREF site (and is considering  
8 locations east of the proposed site), but this work will be gradual, subject to private landowner  
9 approval, and dependent on the annual ITD District 6 operating budget. Where snow fencing is  
10 not an option (and landowners approve), trenching can be an effective method of snow drift  
11 reduction. ITD has worked with the local school system to provide a plow escort and maintain  
12 access (i.e., for school buses) during road closures; ITD would likely work with the proposed  
13 EREF to facilitate shift changes that occur during road closures (ITD, 2010c,d).

14  
15 Fire-related closures of US 20 are possible, but are less frequent and shorter in duration than  
16 weather-related closures. Most fire-related closures occur near INL; ITD has observed few fires  
17 to the east of the proposed EREF site. Dust storms occurring after fires (in the spring) can  
18 create localized drifting problems (ITD, 2010d).

19  
20 Load limits on US 20 (between Idaho Falls and the proposed EREF site) and I-15 are controlled  
21 by ITD. The three-axle gross vehicle weight limits are 29,257 kilograms (64,500 pounds) on  
22 US 20 and 31,979 kilograms (70,500 pounds) on I-15 (AES, 2010; ITD, 2010a). Overweight  
23 permits can be issued for vehicles and/or loads exceeding this limit (ITD, 2007).

24  
25 The current traffic volume on I-15 in the vicinity of Idaho Falls (and the junction with US 20) is  
26 approximately 18,000 vehicles per day (see Table 3-23). Design capacities for highways are  
27 not typically calculated, as capacities are considered high by default. However, the LOS on I-15  
28 in the vicinity of Idaho Falls has been described as free flow (typically), with the LOS south of

1 the city dropping to reasonably free flow or stable during peak periods (ITD, 2010c). Currently  
2 there are no plans to make any upgrades to I-15 in the vicinity of Idaho Falls.

3  
4 There is currently no road or parking infrastructure at the proposed EREF site.

### 5 6 **3.10.2 Rail**

7  
8 There is no direct rail access to the proposed EREF site, and there are no plans to perform any  
9 shipping operations by rail (AES, 2010). Nevertheless, Union Pacific provides three branches of  
10 freight rail service through Idaho Falls (Montana Main, Yellowstone, and Aberdeen), with the  
11 nearest access being approximately 32 kilometers (20 miles) to the east (AES, 2010;  
12 ITD, 1996).

13  
14 In addition, a DOE-owned spur that connects at the Scoville Siding provides active freight  
15 service to the nearby INL, approximately 40 kilometers (25 miles) to the west of the proposed  
16 EREF site. A regional short line carrier, Eastern Idaho Railroad, connects areas north and east  
17 of Idaho Falls to Union Pacific lines (AES, 2010).

### 18 19 **3.10.3 Air**

20  
21 Two airports serve the region of the proposed EREF site. The Idaho Falls Regional Airport,  
22 approximately 32 kilometers (20 miles) east of the proposed site, is operated by the City of  
23 Idaho Falls. It provides regularly scheduled regional passenger service to Denver, Salt Lake  
24 City, Boise, Seattle, and Las Vegas. The airport has two runways that are different sizes to  
25 accommodate commercial and private aviation. Approximately 32 kilometers (20 miles) to the  
26 west of the proposed EREF site is Midway Airport in Atomic City. This airport is used  
27 exclusively by private planes (AES, 2010).

28  
29 In addition to these small regional airports that serve eastern Idaho is the Salt Lake City  
30 International Airport, which is approximately 336 kilometers (210 miles) south of Idaho Falls.

### 31 32 **3.10.4 Water**

33  
34 Although the Snake River flows through Idaho Falls east of the proposed EREF site, there are  
35 no ports or viable water transportation routes that serve the region.

## 36 37 **3.11 Public and Occupational Health**

38  
39 This section describes background radiation exposure in general and potential local influences  
40 near the proposed EREF. Potential health effects from exposure to radiation and to chemicals  
41 relevant to the proposed EREF are discussed as well. Several different media in and around  
42 the proposed EREF site contain radionuclides and chemicals that are both naturally occurring  
43 and anthropogenic (i.e., human-made) from historical and current operations at the nearby INL  
44 and from atomic bomb testing fallout. These media include soil, surface water, sediment,  
45 groundwater, and air. This section describes these radiological and chemical background and  
46 anthropogenic levels in terms of public and occupational exposure and health. It also  
47 summarizes the cancer incidence and death rates in the region, which were sufficient to

1 establish baseline information for the analysis in Chapter 4 of the impacts on public and worker  
2 health that may be a result of preconstruction and the proposed action.

### 3 4 **3.11.1 Background Radiological Exposure**

5  
6 Section 3.11.1.1 discusses the exposure from general background radiation that includes  
7 naturally occurring sources and man-made sources, except the exposure from INL operations.  
8 Offsite radiological exposures from the operation of INL are discussed in Section 3.11.1.2.  
9

#### 10 **3.11.1.1 General Background Radiation**

11  
12 Humans are exposed to ionizing radiation from many sources in the environment, as shown  
13 below. Radioactivity from naturally occurring elements in the environment is present in soil,  
14 rocks, and living organisms. A major proportion (68 percent) of natural background radiation  
15 comes from naturally occurring radon. Together, these natural radiation sources contribute  
16 approximately 3.1 millisieverts (310 millirem) per year to the average total radiation dose that  
17 members of the general public annually receive (NCRP, 2009).  
18

19 Ubiquitous background radiation contributes 50 percent of the average total radiation doses  
20 members of the general public receive. The remaining 50 percent of the average total radiation  
21 dose is associated with medical (48 percent) and industrial (2 percent) sources. As shown in  
22 Figure 3-33, approximately 48 percent of the annual background radiation dose (corresponding  
23

#### ***Radiation Dose and Dose Equivalent***

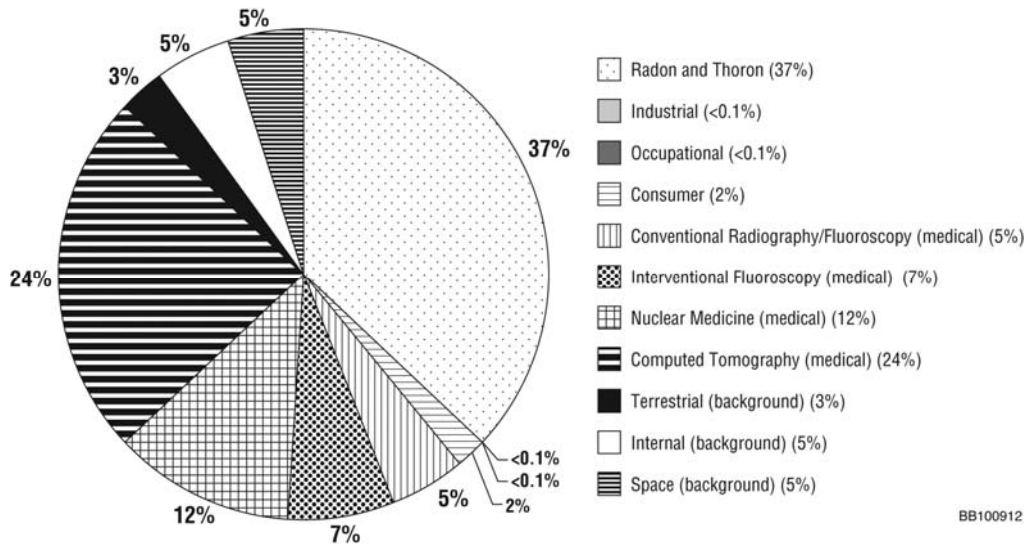
The exposure to radioactive material results in a radiation dose to the body. Radiation dose can result from external (outside the body) exposures such as gamma radiation emanating from the soil as well as internal exposures resulting from ingestion, such as potassium-40 (<sup>40</sup>K) that resides naturally in bananas. The amount of energy deposited in matter is called the radiation dose and has SI units of gray (Gy)

In order to account for the damage done by different types of radiation, the term “dose equivalent” was developed. This allows different radiation doses from different radiation types to be compared. The radiation dose equivalent has SI units of sieverts (Sv).

Depending on its chemical form, radioactive material may transport to different parts of the body and reside in different organs when it is either ingested or inhaled. Each of these organs has different sensitivity to radiation. In addition, the radioactive material may reside in the body for many years. Therefore, to derive a whole body radiation dose equivalent, one must combine the effects of different radiation types with different organ sensitivities and consider the amount of time the radioactive material remains in the body. The term committed dose equivalent is used to describe the radiation dose equivalent a person will receive due to the radioactive material residing in the body after inhaling or ingesting radioactive material. This whole body dose equivalent has SI units of sieverts (Sv).

For brevity, it is common to refer to the whole body radiation dose equivalent as just the radiation dose. When the term radiation dose is used in this EIS, it refers to the total whole body committed radiation dose equivalent and will be expressed in SI units of Sv and parenthetically in conventional units of rem where 100 rem = 1 Sv.





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**Figure 3-33 Percentage Contribution to the Effective Dose from All Sources of Radiation in the U.S. Population for 2006 (NCRP, 2009) (Reprinted with permission of the NCRP, <http://NCRPonline.org>.)**

to 3.0 millisieverts [300 millirem]) is associated with medical sources, including computer tomography (24 percent), nuclear medicine (12 percent), interventional fluoroscopy (7 percent), and conventional radiograph/ fluoroscopy (5 percent). Consumer products and industrial and occupational sources of radiation comprise the remaining 2 percent (0.1 millisievert [10 millirem]) (NCRP, 2009).

### 3.11.1.2 Idaho National Laboratory

The location of the proposed EREF is within 8 kilometers (5 miles) of INL, a DOE laboratory in eastern Idaho. INL prepares an annual site environmental report for DOE summarizing environmental monitoring programs and other environmental activities at INL (DOE, 2007). Since the INL site is in such close proximity, the routine release of radioactive material from the INL would be considered part of the affected environment.

The radiological dose to the public surrounding the INL site is too small to be measured by available monitoring techniques. To show compliance with Federal regulations established to ensure public safety, the dose from INL site operations was calculated by using the amounts of radionuclides released during the year from INL site facilities that were reported and appropriate air dispersion computer codes. The noble gas krypton-85 ( $^{85}\text{Kr}$ ) accounted for approximately 58 percent of the total release, followed by tritium ( $^3\text{H}$ ) with 25 percent and argon-41 ( $^{41}\text{Ar}$ ) with 16 percent of the total. The noble gas xenon-135 ( $^{135}\text{Xe}$ ) contributed 1 percent. However, because these are noble gases, they contribute very little to the cumulative dose (affecting immersion only). Other than  $^{41}\text{Ar}$  and  $^3\text{H}$ , the radionuclides contributing to the overall dose were 0.01 percent of the total radionuclides released (DOE, 2007).

According to the 2007 INL site environmental report (DOE, 2007), the calculated maximum individual dose was 0.93 microsievert (0.093 millirem). The radionuclides contributing the most to this calculated dose were strontium-90 ( $^{90}\text{Sr}$ ), which contributed 47 percent; isotopes of

1 plutonium (plutonium-238 [<sup>238</sup>Pu], plutonium-239 [<sup>239</sup>Pu], and plutonium-240 [<sup>240</sup>Pu]), which  
2 contributed 27 percent; isotopes of americium (americium-241 [<sup>241</sup>Am] and americium-243  
3 [<sup>243</sup>Am]), which contributed 15 percent; cesium-137 (<sup>137</sup>Cs), which contributed 9 percent; and  
4 iodine-129 (<sup>129</sup>I), which contributed 1 percent. For comparison, the calculated maximum  
5 individual doses for 2003, 2004, 2005, and 2006 were 0.04, 0.04, 0.08, 0.04 millirem,  
6 respectively (DOE, 2007).

7  
8 As part of an oversight program for the INL, the State of Idaho maintains 12 high-pressure ion  
9 chambers (HPICs) that provide real-time radiation exposure rates. Data are collected by the  
10 Idaho Department of Environmental Quality via radiotelemetry and are available to the public  
11 on the World Wide Web. The HPIC closest to the proposed EREF site (Rover Met Tower)  
12 has recorded an average exposure rate of  $3.55 \times 10^{-9} \pm 0.24 \times 10^{-9}$  coulombs per kilogram per  
13 hour ( $13.75 \pm 0.92$  microrentgen per hour) over the last 3.5 years (AES, 2010). These  
14 recorded values are comparable with exposure measurements obtained from background  
15 locations (IDEQ, 2008).

### 17 **3.11.2 Background Chemical Exposure**

18  
19 The location for the proposed EREF is on a site currently operated as a farm in an area  
20 characterized by farming and public lands. There are no known major sources of chemical  
21 exposure at this site that might impact the public. From the fall of 2007 to spring 2008, as part  
22 of soil characterization, AES collected 10 surface soil samples across the proposed site. The  
23 results of this sampling are presented in Section 3.6.4.2 and are summarized here. The  
24 samples were analyzed for metals, fluoride, pesticides, VOCs, and SVOCs (AES, 2010). All  
25 eight metals analyzed were within the range of local background areas. Only sporadic hits of  
26 trace levels of a few VOCs and SVOCs were found; they were mainly polycyclic aromatic  
27 hydrocarbons (PAHs) attributable to vehicle exhaust and other combustion sources. The only  
28 detection of a pesticide or herbicide compound in the samples was of trace levels (maximum  
29 0.0110 milligram per kilogram) of the substance chlorpropham, which is used to inhibit sprouting  
30 of potatoes in storage.

31  
32 Regarding other media, regional air quality in Bonneville County is classified as “good”  
33 95.7 percent of the time and “moderate” 4.3 percent of the time, as discussed in Section 3.5.3.  
34 No surface water resources exist on the proposed site, as indicated in Section 3.7.1.1. Site  
35 groundwater has been tested for and found to be unimpacted by chemical contamination,  
36 including organic compounds, PCBs, pesticides, and metals, as discussed in Section 3.7.2.4.

### 38 **3.11.3 Public Health Studies**

#### 40 **3.11.3.1 Regulatory Requirements for Public and Occupational Exposure**

41  
42 NRC regulations in 10 CFR Part 20 identify maximum allowable concentrations of radionuclides  
43 in air and water above background at the boundary of unrestricted areas to control radiation  
44 exposures of the public and releases of radioactivity. The most restrictive maximum allowable  
45 concentration in air and water for uranium isotopes is  $5 \times 10^{-14}$  and  $3 \times 10^{-7}$  microcuries per cubic  
46 centimeter, respectively. Other 10 CFR Part 20 requirements are that the sum of the external  
47 and internal doses (Total Effective Dose Equivalent [TEDE]) for a member of the public may not  
48 exceed 1 millisievert per year (100 millirem per year), and the radiation levels at any

1 unrestricted area should not exceed 0.02 millisievert (2 millirem) in any 1 hour and  
2 0.5 millisievert (50 millirem) in a single year.

3  
4 In addition to keeping within NRC requirements, releases to the environment must comply with  
5 EPA standards in 40 CFR Part 190, Subpart B. These standards specify limits on the annual  
6 dose equivalent from normal operations of uranium fuel-cycle facilities (except mining, waste  
7 disposal operations, transportation, and reuse of recovered special nuclear and byproduct  
8 materials). The public dose limit for annual whole body and any organ is 0.25 millisievert  
9 (25 millirem), and for the thyroid it is 0.75 millisievert (75 millirem).

10  
11 10 CFR 20.1201 limits the TEDE of workers to ionizing radiation. Table 3-24 provides  
12 occupational dose limits for radiation workers who work at nuclear facilities.

### 14 **3.11.3.2 Health Effects from Radiological Exposure**

15  
16 Radiation interacts with the atoms that form cells. There are two mechanisms by which  
17 radiation affects cells: direct action and indirect action. In a direct action, the radiation interacts  
18 directly with the atoms of the DNA molecule or some other component critical to the survival of  
19 the cell. Since the DNA molecules make up a small part of the cell, the probability of direct  
20 action is small. Because most of the cell is made up of water, there is a much higher probability  
21 that radiation would interact with water. In an indirect action, radiation interacts with water and  
22 breaks the bonds that hold water molecules together and produces reactive free radicals that  
23 are chemically toxic and destroy the cell. The body has mechanisms to repair damage caused  
24 by radiation. Consequently, the biological effects of radiation on living cells may result in one  
25 of three outcomes: (1) injured or damaged cells repair themselves, resulting in no residual  
26 damage; (2) cells die, much like millions of body cells do every day, being replaced through  
27 normal biological processes and causing no health effects; or (3) cells incorrectly repair  
28 themselves, which results in damaging or changing the genetic code (DNA) of the irradiated  
29 cell. Stochastic effects, that is, effects that may or may not occur based on chance, may occur  
30 when an irradiated cell is modified rather than killed. The most significant stochastic effect of  
31 radiation exposure is that a modified cell may, after a prolonged delay, develop into a cancer  
32 cell.

33  
34 The biological effects on the whole body from exposure to radiation depend on many factors,  
35 such as the type of radiation, total dose, time interval over which the dose is received, and part  
36 of the body that is exposed. Not all organs are equally sensitive to radiation. The blood-forming  
37 organs are most sensitive to radiation; muscle and nerve cells are relatively insensitive to  
38 radiation. Health effects may be characterized according to two types of radiation exposure:  
39 (1) a single accidental exposure to high doses of radiation for a short period of time (acute  
40 exposure), which may produce biological effects within a short time after exposure, and (2) long-  
41 term, low-level overexposure, commonly called continuous or chronic exposure. High doses of  
42 radiation can cause death. Other possible effects of a high radiation dose include erythema,  
43 dry desquamation, moist desquamation, hair loss, sterility, cataracts, and acute radiation  
44 syndromes. Currently there are no data to unequivocally establish the occurrence of cancer  
45 following exposure to low doses and dose rates – below about 100 millisieverts  
46 (10,000 millirem) (NRC, 2004).

**Table 3-24 Occupational Dose Limits for Adults Established by 10 CFR Part 20**

Tissue	Dose Limit
Whole body or any individual organ or tissue other than the lens of the eye	More limiting of 0.05 Sv/yr (5 rem/yr) TEDE to whole body or 0.5 Sv/yr (50 rem/yr) sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye
Lens of the eye	0.15 Sv/yr (15 rem/yr) dose equivalent
Extremities, including skin	0.50 Sv/yr (50 rem/yr) shallow dose equivalent

1  
2 In estimating the health impacts from low dose or low dose rate exposure to occupational  
3 workers and the general public, the probability of a fatal cancer per unit of radiation exposure  
4 recommended by the EPA was used. The estimated probability for both workers and the public  
5 is  $6 \times 10^{-2}$  sievert<sup>-1</sup> (EPA, 1999).  
6

7 The National Program of Cancer Registries (NPCR) is the Centers of Disease Control and  
8 Prevention (CDC) State-based cancer control program. Under this program, States collect,  
9 manage, and analyze data about cancer incidence and mortality. The CDC and the National  
10 Cancer Institute release U.S. cancer statistics annually. Table 3-25 lists the cancer incidence  
11 and death rates for all cancers for 2002 to 2006 for Idaho and the United States.  
12

13 **3.11.3.3 Health Effects from Chemical Exposure**

14  
15 The primary hazardous chemicals of interest associated with the proposed EREF are uranium  
16 and hydrofluoric acid (HF). The latter is produced in the reaction of UF<sub>6</sub>, the form of uranium  
17 used in the enrichment process, with moisture in air. HF is an irritant gas that causes eye,  
18 nose, and skin irritation. Breathing high levels can also harm the lungs and heart  
19 (ATSDR, 2003). Irritant effects in humans, including respiratory track inflammation, begin to be  
20 observed in the 1 to 10 ppm range, similar to occupational exposure limits. Low-level exposure  
21 effects are reversible once the exposure is terminated. Members of the public are generally not  
22 exposed to levels that have observable health effects from routine industrial emissions. There  
23 are no known background sources of HF exposure in the vicinity of the proposed EREF.  
24

25 Uranium in various chemical forms exerts heavy metal toxicity, primarily to the kidneys  
26 (ATSDR, 1999). Exposure to UF<sub>6</sub> or any other uranium compounds that might be released from  
27 the proposed EREF or present within the proposed facility may be via inhalation or ingestion.  
28 The degree of absorption of inhaled uranium from the lung or ingested uranium into the  
29 bloodstream is greater for more soluble forms of uranium, such as UO<sub>2</sub>F<sub>2</sub>, which is formed from  
30 the reaction of UF<sub>6</sub> and water along with HF. Little direct toxicological data are available on  
31 chemical toxicity in humans at low inhalation exposures. Standards are based mainly on tests  
32 in mammals, which show low-level systemic health effects beginning at inhalation exposures in  
33 the 0.1 to 1 milligram per cubic meter range for chronic exposures. As for HF, there are no  
34 known background sources of uranium exposure in the vicinity of the proposed EREF, except  
35 from the very low levels occurring naturally in soils.  
36

**Table 3-25 Cancer Incidence and Death Rates for All Cancers for 2002 to 2006<sup>a</sup>**

Area	All Cancer Incidence Rate	All Cancer Death Rate
United States	471.3	186.9
Idaho	461.7	171.6

<sup>a</sup> Per 100,000 persons and are age adjusted to the 2000 U.S. standard population.  
Source: CDC, 2010.

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**3.12 Socioeconomics**

This section describes current socioeconomic conditions and local community services within the region of influence (ROI) surrounding the site of the proposed EREF. Although the data used (BEA 2010) to estimate the impacts of the proposed EREF project comprised an 11-county ROI in Idaho – including Bannock, Bingham, Blaine, Bonneville, Butte, Caribou, Clark, Fremont, Jefferson, Madison, and Power Counties – the majority of the economic impacts of the proposed facility are expected to occur in two of these counties, Bingham and Bonneville Counties. These two counties (i.e., the two-county ROI) are expected to encompass the area in which the majority of EREF workers are expected to spend most of their wages and salaries, and which are expected to be the primary source of labor for each phase of the proposed EREF. It is also the area in which a significant portion of site purchases and non-payroll expenditures from the construction, manufacturing, operation, and decommissioning phases of the proposed facility are expected to occur. As it is anticipated that a number of workers will move into the area during each phase of the proposed project, with the majority of the demographic and social impacts associated with population in-migration likely to occur in Bingham and Bonneville Counties, the impacts of the proposed EREF on population, housing, and community services are assessed for a two-county ROI, consisting of Bingham and Bonneville Counties.

**3.12.1 Population Characteristics**

The population in the two-county ROI is characterized in terms of the major population centers around the proposed site, population growth trends, and significant transient and special populations. Minority and low-income populations are discussed in the environmental justice discussion in Section 3.13.

**3.12.1.1 Major Population Centers**

One city, Idaho Falls (estimated 2006 population 52,786), is located in Bonneville County, and several small towns are located in the remainder of the ROI, including Pocatello (53,932 residents in 2006), Blackfoot (11,007) and Shelley (4195) (U.S. Census Bureau, 2009a).

Estimated population density in the two-county ROI is highest in Bingham County, with 34.4 persons per square kilometer (89.1 per square mile) in 2008. Bonneville County has more



1 land area than Bingham County and has a smaller population, with a population density of  
2 9.1 persons per square kilometer (23.5 per square mile) (U.S. Census Bureau, 2009b).

### 3 4 **3.12.1.2 Population Growth Trends**

5  
6 Table 3-26 presents recent and projected populations for the two-county ROI and Idaho. As  
7 shown, estimated population in the ROI stood at 143,038 in 2008, having grown at an average  
8 annual rate of 1.8 percent since 2000. This growth was lower than the 2.1 percent annual  
9 average growth rate for Idaho as a whole of over the same period.

10  
11 The population has grown in both counties in the two-county ROI since 2000. Bonneville  
12 County recorded an annual average population growth of 2.3 percent between 2000 and 2008,  
13 while Bingham County grew by 0.6 percent during the same period. The estimated ROI  
14 population is expected to increase to 156,491 by 2013 and to 168,331 by 2017. Both counties  
15 in the ROI are projected to experience positive population growth between 2008 and 2017.

### 16 17 **3.12.1.3 Transient and Special Populations**

18  
19 In addition to the residential population, institutional, transient, and seasonal populations occur  
20 in the two-county ROI. Institutional populations include school populations, which are described  
21 in Section 3.12.3.2. The transient population consists of visitors participating in various  
22 seasonal, social, and recreational activities within the local area. The region also has a large  
23 number of seasonal farm workers, as well as a number of seasonal workers in the construction  
24 and hospitality industries. Although U.S. Census and other Federal data may include transient  
25 and special population groups that were present when the Census was taken, data on the  
26 education level, ethnicity, and income characteristics of specific transient and special  
27 populations are not available.

## 28 29 **3.12.2 Economic Trends and Characteristics**

### 30 31 **3.12.2.1 Employment**

32  
33 Employment in the two-county ROI stood at 62,608 in 2006 (Table 3-27). Over the past  
34 decade, employment within the two-county ROI has shifted slightly from government,  
35 construction, and farm sectors toward service, wholesale and retail trade, and manufacturing  
36 sectors. Currently, the service sector provides the highest percentage of employment in the  
37 region at 51.2 percent, followed by the wholesale and retail trade at 19.2 percent. Smaller  
38 employment shares are held by transportation and public utilities (10.4 percent) and agriculture  
39 (9.2 percent). The distribution of employment across sectors within the ROI is similar to that of  
40 the ROI as a whole, with a slightly higher percentage of employment in agriculture  
41 (12.6 percent), manufacturing (18.7 percent), and transportation and public utilities  
42 (21.1 percent) in Bonneville County. At 32.4 percent of total employment, Bonneville has less  
43 service employment than in the ROI as a whole.

### 44 45 **3.12.2.2 Unemployment**

46  
47 Unemployment rates have varied across the two counties in the ROI (Table 3-28). Over the  
48 10-year period 1999–2008, the average rate in Bingham County was 4.0 percent, with a lower

**Table 3-26 Population in the Two-County ROI and Idaho**

Location	2000	2008	Average Annual Growth (%) 2000–2008	2013	2017
Bingham County	41,735	43,903	0.6	45,315	46,477
Bonneville County	82,522	99,135	2.3	111,176	121,854
ROI	124,257	143,038	1.8	156,491	168,331
Idaho	1,293,953	1,523,816	2.1	1,687,782	1,831,569

Source: U.S. Census Bureau, 2009a; Argonne, 2010.

1  
 2 rate of 3.1 percent in Bonneville County. The average rate in the ROI as a whole over this  
 3 period was 3.4 percent, which was lower than the average rate for the State of 4.4 percent.  
 4 Unemployment rates for the first three months of 2009 contrast markedly with rates for 2008 as  
 5 a whole; in Bonneville County, the unemployment rate increased to 6.1 percent, while in  
 6 Bingham County the rate reached 5.6 percent. The average rate for the two-county ROI  
 7 (5.7 percent) and the State (7.0 percent) during this period were also higher than the  
 8 corresponding average rates for 2008.

9  
 10 **3.12.2.3 Income**

11  
 12 Total personal income in the two-county ROI stood at \$4.5 billion in 2007 and had grown at an  
 13 annual average rate of 3.1 percent over the period 1998 to 2007 (Table 3-29). ROI personal  
 14 income per capita also rose over the same period, but at a slower rate of 1.7 percent, increasing  
 15 from \$27,023 to \$31,973. Per capita incomes were higher in Bonneville County (\$34,630) in  
 16 2007 than in Bingham County (\$26,068). Although personal income and per capita income  
 17 growth rates in the two-county ROI have been higher than for the State as a whole, personal  
 18 income per capita was slightly higher in the State (\$32,908) in 2007 than in the ROI. Although  
 19 no corresponding data are available for Bingham and Bonneville Counties, in Idaho as a whole  
 20 in 2007, there were 74,152 single-parent families, 18.7 percent of the total number of families in  
 21 the State (U.S. Census Bureau, 2009b). The median annual family income of a single female  
 22 parent with children under the age of 18 was \$22,369.

23  
 24 Median household income in the two-county ROI over the period 2006–2008 ranged from  
 25 \$44,232 in Bingham County to \$51,232 in Bonneville County (Table 3-29). The average in the  
 26 ROI as a whole was \$47,732, slightly higher than the State average of \$47,331.

27  
 28 **3.12.3 Housing Resources and Community and Social Services**

29  
 30 This section describes housing and social services in the two-county ROI, including schools, law  
 31 enforcement, and firefighting.

32

**Table 3-27 Two-County ROI Employment in 2006<sup>a</sup>**

Industry	Bingham County	% of Total	Bonneville County	% of Total	ROI	% of Total	Idaho	% of Total
Agriculture <sup>a</sup>	4324	8.5	1456	12.6	5780	9.2	50,540	8.5
Mining	0	0.0	0	0.0	0	0.0	2202	0.4
Construction	3409	6.7	1093	9.4	4502	7.2	52,804	8.9
Manufacturing	2728	5.3	2173	18.7	4901	7.8	64,212	10.8
Transportation and public utilities	4079	8.0	2448	21.1	6527	10.4	80,257	13.5
Wholesale and retail trade	9461	18.5	2540	21.9	12,001	19.2	104,604	17.6
Finance, insurance, and real estate	1686	3.3	310	2.7	1996	3.7	30,576	5.2
Services	28,286	55.0	3759	32.4	32,045	51.2	268,527	45.3
Other	24	0.0	1	0.0	25	0.0	184	0.0
Total	51,007		11,601		62,608		593,185	

<sup>a</sup> Agricultural employment includes 2007 data for hired farm workers.

Source: U.S. Census Bureau, 2009c; USDA, 2009.

**Table 3-28 Two-County ROI Unemployment Rates (percent)**

Location	1999–2008	2008	2009 <sup>a</sup>
Bingham County	4.0	3.9	5.6
Bonneville County	3.1	3.4	6.1
ROI	3.4	3.5	5.7
Idaho	4.4	4.9	7.0

<sup>a</sup> Rates for 2009 are the average for January through March.

Source: DOL, 2009a–d.

1

**Table 3-29 Two-County ROI and State Personal Income**

Location	1998	2007	Annual Average Growth, 1998–2007 (%)
<b>Bingham County</b>			
Total income (billion 2008 \$)	1.0	1.1	1.6
Per capita income (\$)	23,303	26,068	1.1
Median household income <sup>a</sup>		44,232	
<b>Bonneville County</b>			
Total income (billion 2008 \$)	2.3	3.3	3.6
Per capita income (\$)	28,925	34,630	1.8
Median household income <sup>a</sup>		51,232	
<b>Two-County ROI</b>			
Total income (billion 2008 \$)	3.3	4.5	3.1
Per capita income (\$)	27,023	31,973	1.7
Median household income <sup>a</sup>		47,732	
<b>Idaho</b>			
Total income (billion 2008 \$)	36.5	49.2	3.0
Per capita income (\$)	29,120	32,908	1.2
Median household income <sup>a</sup>		47,331	

<sup>a</sup> 2006–2008, 3-year average.

Source: DOC, 2009; U.S. Census Bureau, 2009d.

2  
3

1 **3.12.3.1 Housing**  
2

3 Nearly 196,000 housing units were located in the two counties in 2007, with more than  
4 70 percent of these located in Bonneville County (Table 3-30). The majority of housing units in  
5 the region are single-family structures (75 percent), but the number of multi-family structures is  
6 increasing as the region develops (U.S. Census Bureau, 2009b). Vacancy rates do not vary  
7 significantly between the two counties, with 9.2 percent of units vacant in Bingham County and  
8 9.0 percent in Bonneville County. Owner-occupied units comprise 81 percent of the occupied  
9 units in Bingham County, but only 73 percent of the occupied units in Bonneville County. At the  
10 time of the 2000 Census, 480 seasonal-, recreational-, or occasional-use units were vacant.

11  
12 Housing density in the two-county ROI was 6.8 units per square kilometer (17.7 per square  
13 mile), compared to 2.9 units per square kilometer (7.6 per square mile) for the State as a whole.  
14 There were 7.7 units per square kilometer (19.9 per square mile) in Bonneville County and  
15 5.4 units per square kilometer (13.9 per square mile) in Bingham County (U.S. Census  
16 Bureau, 2009a).

17  
18 Housing stock in the two-county ROI as a whole grew at an annual rate of 2.3 percent over the  
19 period 2000–2007, with 7872 new units added to the existing housing stock in the ROI  
20 (Table 3-30). With an overall vacancy rate of 9.1 percent, there were 4770 vacant housing units  
21 in the two-county ROI in 2007, of which 1073 (251 in Bingham County, 822 in Bonneville  
22 County) are expected to be rental units available to construction workers at the proposed EREF.

23  
24 The median value of a home in Bonneville County of \$93,500 was about 10.7 percent greater  
25 than the \$84,400 in Bingham County. The median value of homes in both counties was  
26 somewhat lower than the \$106,300 median value for the State of Idaho (U.S. Census  
27 Bureau, 2009a).

28  
29 **3.12.3.2 Schools**  
30

31 Seventy-four public and private elementary, middle, and high schools are located in the  
32 two-county ROI (NCES, 2009). Table 3-31 provides summary statistics for the school districts  
33 in the ROI, including enrollment, educational staffing, and two indices of educational quality –  
34 student-teacher ratios and levels of service (number of teachers per 1000 population). The  
35 student-teacher ratio in Bonneville County schools (19.8) is slightly higher than for schools in  
36 Bingham County (18.0), while the level of service is slightly higher in Bingham County. Five  
37 colleges and adult learning centers are located within 80.5 kilometers (50 miles) of the proposed  
38 EREF site, with a combined enrollment of 27,820 (NCES, 2009). The closest schools to the  
39 proposed EREF site are about 32 kilometers (20 miles) east in Idaho Falls.

40  
41 **3.12.3.3 Public Safety**  
42

43 Several State, county, and local police departments provide law enforcement in the two-county  
44 ROI. Bonneville County has 57 officers and would provide law enforcement services to the  
45 proposed EREF (Table 3-32); Bingham County has 30 officers (Table 3-32) (FBI, 2009).  
46 Currently there are 95 professional firefighters in Bonneville County and 39 in Bingham County  
47 (Table 3-32). The Idaho Falls Fire Department, the Ucon Volunteer Fire Department, and the  
48 Shelley Firth Rural Fire District all are located about 32 kilometers (20 miles) from the site of the



**Table 3-30 Two-County ROI Housing Characteristics**

<b>Parameter</b>	<b>2000</b>	<b>2007<sup>a</sup></b>
<b>Bingham County</b>		
Owner occupied	10,564	11,290
Rental	2753	2735
Vacant units	986	1415
Seasonal and recreational use	103	NA <sup>b</sup>
Total units	14,303	15,540
<b>Median value of owner-occupied units</b>	<b>\$84,400</b>	<b>\$121,400</b>
<b>Bonneville County</b>		
Owner occupied	21,467	24,742
Rental	7286	9122
Vacant units	1731	3355
Seasonal and recreational use	377	NA
Total units	30,484	37,219
<b>Median value of owner-occupied units</b>	<b>\$93,500</b>	<b>\$148,300</b>
<b>Two-County ROI Total</b>		
Owner occupied	32,031	36,034
Rental	10,039	11,857
Vacant units	2717	4770
Seasonal and recreational use	480	NA
Total units	44,787	52,659
<b>Median value of owner-occupied units</b>	<b>\$88,950</b>	<b>\$134,850</b>

<sup>a</sup> 2006–2008, 3-year average.

<sup>b</sup> NA = not available.

Source: U.S. Census Bureau, 2009a,b,d.

**Table 3-31 School District Data for the Two-County  
ROI in 2007**

Location	Number of Students	Number of Teachers	Student-Teacher Ratio	Level of Service <sup>a</sup>
Bingham County	9902	550	18.0	12.7
Bonneville County	19,557	988	19.8	10.2
ROI	29,459	1538	19.2	11.0

<sup>a</sup> Number of teachers per 1000 population.  
Source: NCES, 2009.

1

**Table 3-32 Public Safety Employment in the Two-County  
ROI in 2009**

Location	Number of Police Officers	Level of Service <sup>a</sup>	Number of Firefighters <sup>b</sup>	Level of Service <sup>a</sup>
Bingham County	30	0.7	39	0.9
Bonneville County	57	0.6	95	1.0
ROI	87	0.6	134	0.9

<sup>a</sup> Number per 1000 population.  
<sup>b</sup> Number does not include volunteers.  
Source: FBI, 2009; FireDepartments.Net, 2009.

2

3 proposed facility. Levels of service in police and fire protection in each county are similar to  
4 those for the two-county ROI as a whole (Table 3-32).

5

#### 6 **3.12.4 Tax Structure and Distribution**

7

8 Tax revenue in Idaho comes from primarily personal and corporate income taxes, sales and use  
9 taxes, and property taxes. Personal income taxes range from 1.6 percent on the first \$1198 of  
10 taxable income to 7.8 percent of taxable income above \$23,963 for single filers and \$47,926 for  
11 married couples filing jointly (ISTC, 2009). A 6 percent sales tax is applied to the sale, rental, or  
12 lease of tangible personal property, while rates on some services, including food, hotel, motel,  
13 and campground accommodations, vary from 8 percent to 12 percent. A use tax is applied to  
14 stored goods if sales taxes have not already been paid (ISTC, 2009). Property taxes are  
15 collected by the county in which the proposed EREF property is located. The property tax rates  
16 for Bonneville County were 1.6 percent on average for urban property and 1.01 percent on  
17 average in rural areas. In Bingham County, the average 2007 rates were 2.1 percent for urban  
18 property and 1.2 percent for rural property (ISTC, 2009).

19

#### 20 **3.13 Environmental Justice**

21

22 On February 11, 1994, the President signed *Executive Order* 12898, "Federal Actions to  
23 Address Environmental Justice in Minority Populations and Low-Income Populations," which  
24 directs all Federal agencies to develop strategies for considering environmental justice in their

1 programs, policies, and activities. Environmental justice is described in the *Executive Order* as  
2 “identifying and addressing, as appropriate, disproportionately high and adverse human health  
3 or environmental effects of its programs, policies, and activities on minority populations and  
4 low-income populations.”  
5

6 On December 10, 1997, the Council on Environmental Quality (CEQ) issued *Environmental*  
7 *Justice Guidance under the National Environmental Policy Act* (CEQ, 1997). In addition to  
8 following general guidelines on the evaluation of environmental analyses set forth in the  
9 document *Environmental Review Guidance for Licensing Actions Associated with NMSS*  
10 *[Nuclear Material Safety and Safeguards] Programs* (NUREG-1748) (NRC, 2003a), the NRC  
11 has issued a final policy statement on the *Treatment of Environmental Justice Matters in NRC*  
12 *Regulatory and Licensing Actions* (69 FR 52040) and environmental justice procedures to be  
13 followed in NEPA documents prepared by the NRC’s Office of Nuclear Material Safety and  
14 Safeguards (NRC, 2003b).  
15

16 Consistent with NRC guidelines and procedures set forth in Appendix C to NUREG-1748  
17 (NRC, 2003a) and the NRC’s *Policy Statement on the Treatment of Environmental Justice*  
18 *Matters in NRC Regulatory and Licensing Actions* (NRC, 2004), this section describes data from  
19 the 2000 U.S. Census on minority and low-income populations within a 6.4-kilometer (4-mile)  
20 radius of the proposed EREF site (see Appendix G). This area includes a total of four Census  
21 block groups, including two in Bonneville County, the location of the proposed EREF, and one  
22 each in Bingham and Jefferson Counties (U.S. Census Bureau, 2009a).  
23

### 24 **3.13.1 Minority Populations**

25  
26 The CEQ guidelines define “minority” to include members of American Indian or Alaska Native,  
27 Asian or Pacific Islander, Black non-Hispanic, and Hispanic populations (CEQ, 1997).  
28

29 Minority individuals are persons who identify themselves as members of the following population  
30 groups: Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or  
31 other Pacific Islander, some other race, two or more races (meaning individuals who identified  
32 themselves on the 2000 Census form as being a member of two or more races, for example,  
33 White and Hispanic), and Hispanic or Latino. The 2000 Census allowed individuals the option  
34 of identifying themselves in one or more race categories, thereby creating the multiracial  
35 Census category of “two or more races.” They are generally counted as part of the minority  
36 group they identified.  
37

38 Minority populations can be determined by subtracting White, Not Hispanic or Latino  
39 populations from the total population.  
40

41 There are no Census block groups in which the minority population either exceeds 50 percent of  
42 the total population and/or is more than 20 percentage points higher than the State or county  
43 percentage. Table 3-33 presents data for minority populations for the 6.4-kilometer (4-mile)  
44 area, for each county, and for the State.  
45

**Table 3-33 Minority and Low-Income Populations within a 6.4-kilometer (4-mile) Radius of the Proposed EREF Site**

County	4-mile Radius			County Percent Minority	State Percent Minority
	Total Population <sup>a</sup>	Minority Population	Percent Minority		
Bingham County	1438	234	16.3	17.6	
Bonneville County	1777	244	13.7	7.2	9.0
Jefferson County	957	202	21.1	9.1	

County	4-mile Radius			County Percent Low-Income	State Percent Low-Income
	Total Population <sup>b</sup>	Low-Income Population	Percent Low-Income		
Bingham County	1384	162	11.7	12.4	
Bonneville County	1745	178	10.2	10.1	11.8
Jefferson County	957	223	23.3	10.4	

<sup>a</sup> 2000 data.

<sup>b</sup> 1999 data.

Source: U.S. Census Bureau, 2009a.

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**3.13.2 Low-Income Populations**

Low-income populations are those that fall below the poverty level identified by the U.S. Census Bureau, including variations by family size and composition. If the total income for a family or unrelated individual falls below the relevant poverty threshold, then the family or unrelated individual is classified as being “below the poverty level.” For example, in 1999, the most recent year for which Census block group data on poverty are available, the poverty threshold for a family of five with three children below the age of 18 was \$19,882. For any given family below the poverty line, all family members are considered as being below the poverty line for the purposes of analysis.

There are no Census block groups in which the low-income population either exceeds 50 percent of the total population and/or is more than 20 percentage points higher than the State or county percentage. Table 3-33 presents data for low-income populations for the 6.4-kilometer (4-mile) area, for each county, and for the State.

**3.13.3 Resource Dependencies and Vulnerabilities of Minority and Low-Income Populations**

In some cases, minority and low-income groups may rely on natural resources for their subsistence and to support unique cultural practices. Differential patterns of consumption of natural resources should be considered (i.e., differences in rates and/or patterns of fish, vegetable, water, and/or wildlife consumption among groups defined by demographic factors such as socioeconomic status, race, ethnicity, and/or cultural attributes). In some

1 circumstances, these groups could be unusually vulnerable to impacts from the proposed  
 2 action. In particular, higher participation in outdoor recreation, home gardening, and  
 3 subsistence fishing may increase exposure risk to low-income and minority groups through  
 4 inhalation or ingestion through various environmental pathways.

5  
 6 Potential resource dependencies were sought in the course of public meetings and other  
 7 information supplied by the Hispanic/Latino and African American/Black communities in  
 8 meetings with the NRC staff. Letters were also sent to the Federally recognized Shoshone-  
 9 Bannock Tribes to determine any potential resource dependencies. These letters solicited their  
 10 concerns on the proposed project and inquired about whether they desired to participate in the  
 11 Section 106 consultation process (see Appendix B). Currently, very few Native Americans live  
 12 in the vicinity of the proposed EREF site (U.S. Census Bureau, 2009a).

13  
 14 In addition, the NRC staff examined data provided by the State of Idaho concerning the health  
 15 status of the general population in Bingham and Bonneville Counties (Table 3-34). No  
 16 exceptional health problems were found among residents in the two counties. It was not  
 17 possible to identify any unusual incidences of birth defects, chronic diseases, or cancer clusters  
 18 at the district level, the smallest area for which published health information is available. Age-  
 19 adjusted cancer deaths are slightly lower in District 6, which includes Bingham County, than in  
 20 District 7, which includes Bonneville County; rates in Districts 6 and 7 are lower than in Idaho as  
 21 a whole. The income and ethnicity of individuals with chronic diseases are not available.  
 22

**Table 3-34 Selected Health Statistics for Counties near the  
 Proposed EREF, 2005–2007 (per 100,000 population)**

	<b>District 6 (includes Bingham County)</b>	<b>District 7 (includes Bonneville County)</b>	<b>Idaho</b>
Annual average age-adjusted major causes of death			
Cancer	148.0	145.7	166.5
Heart disease	198.2	196.6	169.8
Lung cancer	32.0	30.0	42.7
Cerebrovascular disease	57.1	49.7	48.8
Chronic lower respiratory diseases	46.1	48.6	48.9

Source: Idaho Department of Health and Welfare, 2009.

23  
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## 4 ENVIRONMENTAL IMPACTS

This chapter presents the potential environmental impacts associated with preconstruction, construction, operation, and decommissioning of the proposed AREVA Enrichment Services, LLC (AES) Eagle Rock Enrichment Facility (EREF).

### 4.1 Introduction

For the proposed action, this Environmental Impact Statement (EIS) considers impacts from construction activities, normal operations, credible accidents, terrorism, and decommissioning, as well as cumulative impacts and resource commitments. The impacts associated with preconstruction activities are also discussed, although, as discussed in Sections 1.2 and 4.2 of this EIS, preconstruction is not part of the proposed action. The chapter is organized by environmentally affected areas (i.e., land use, historic and cultural resources, visual and scenic resources, air quality, geology and soils, water resources, ecological resources, noise, transportation, public and occupational health, waste management, socioeconomics, and environmental justice) based on the descriptions of the preconstruction activities and the proposed action that are included in Section 2.1. The discussion of impacts on each environmentally affected area is divided into three categories – (1) preconstruction and construction, (2) operation, and (3) decontamination and decommissioning. Impacts from the intermediate time period during which both construction and operations take place are included in the sections on operations.

Within each resource area, those mitigation measures proposed by AES, including additional mitigation measures identified by the U.S. Nuclear Regulatory Commission (NRC) staff, are disclosed in this EIS. While the NRC cannot impose mitigation outside its regulatory authority under the *Atomic Energy Act*, mitigation measures have been identified within this chapter and in Chapter 5 that could potentially reduce the impacts of preconstruction and the proposed action. For the purposes of the *National Environmental Policy Act* of 1969, as amended (NEPA), per Title 10, “Energy,” of the U.S. *Code of Federal Regulations* (10 CFR) Part 51, the NRC is disclosing measures that could potentially reduce or avoid environmental impacts of preconstruction, construction, and operation of the proposed EREF. Any mitigation measures identified by the applicant (AES) and proposed for implementation within the Environmental Report (ER) (AES, 2010a) are listed in Tables 5-1 and 5-2 in Chapter 5

#### ***Determination of the Significance of Potential Environmental Impacts***

*A standard of significance has been established for assessing environmental impacts. Based on the Council on Environmental Quality’s regulations, each impact is to be assigned one of the following three significance levels:*

- **Small:** *The environmental effects are not detectable or are so minor that they would neither destabilize nor noticeably alter any important attribute of the resource.*
- **Moderate:** *The environmental effects are sufficient to noticeably alter but not destabilize important attributes of the resource.*
- **Large:** *The environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.*

*Source: NRC, 2003a.*

1 and have been factored into the NRC staff's environmental impact analysis in Chapter 4. The  
2 additional mitigation measures identified by the NRC staff, which are listed in Tables 5-3 and  
3 5-4 of Chapter 5, are not requirements being imposed upon the applicant.  
4

5 Section 4.2 discusses potential environmental impacts of preconstruction and the proposed  
6 action under consideration in this EIS, namely the preconstruction, construction, and operation  
7 of the proposed EREF in Bonneville County, Idaho. The decontamination and decommissioning  
8 impacts discussed in Section 4.2.16 are preliminary, or estimated, for the proposed EREF.  
9 Detailed impacts from decontamination and decommissioning will be assessed by the staff at  
10 the end of the proposed EREF's operations and prior to NRC approval to begin such activities.  
11 Under 10 CFR 70.38, the NRC requires that AES file an application for decommissioning of the  
12 proposed EREF to be filed 12 months prior to the expiration of the license. This application  
13 would include a detailed Decommissioning Plan that would take into account the extent of  
14 radiological contamination at the site and would require a separate environmental review and  
15 NEPA document. Because decontamination and decommissioning would take place well in the  
16 future, advanced technology improving the decontamination and decommissioning process may  
17 be available. In addition, this chapter discusses the potential cumulative impacts (Section 4.3)  
18 and impacts of the no-action alternative (Section 4.4).  
19

20 The proposed EREF, if licensed, will possess and use special nuclear material, source material,  
21 and byproduct material. Environmental impacts from the proposed EREF may be radiological or  
22 nonradiological. Radiological impacts from the proposed EREF could include radiation doses to  
23 workers and members of the public from the routine operations, transportation, potential  
24 accidents, potential terrorist activities, and decommissioning and environmental impacts from  
25 potential releases to the air, soil, or water. Nonradiological impacts could include chemical  
26 hazards, emissions (e.g., vehicle fumes), occupational accidents and injuries (e.g., vehicle  
27 collisions), and workplace accidents that could occur during preconstruction, construction,  
28 operation, and decommissioning.  
29

## 30 **4.2 Potential Impacts of Preconstruction and the Proposed Action**

31  
32 As described in Section 2.1 of this EIS, the proposed action is the construction, operation, and  
33 decommissioning of the proposed EREF near Idaho Falls in Bonneville County, Idaho. Under  
34 the proposed action, the NRC would issue a license to AES in accordance with the  
35 requirements of 10 CFR Parts 70, 40, and 30 to possess and use source, byproduct, and  
36 special nuclear material.  
37

38 As described in Sections 1.4.1 and 2.1.4.1, the NRC has granted an exemption (NRC, 2010a)  
39 for AES to conduct certain preconstruction (e.g., site preparation) activities prior to granting the  
40 license for the proposed EREF. The NRC staff concluded that the request by AES to perform  
41 these activities is authorized by law, will not endanger life or property or common defense and  
42 security, and is in the public interest. No core production facilities would be constructed as part  
43 of the preconstruction activities. Because preconstruction and construction activities are closely  
44 related and their respective impacts are difficult to separate, Section 4.2 discusses the impacts  
45 of preconstruction and construction together for each resource area, in addition to the impacts  
46 of operation and decommissioning, although preconstruction activities are not part of the  
47 proposed action. Section 4.2.14 provides a summary of estimates regarding the apportionment

1 of impacts between preconstruction (authorized under the exemption) and construction as  
2 defined by NRC (NRC, 2009a).

3  
4 The potential environmental impacts are evaluated below for each of the potentially affected  
5 environmental resources. Sections 4.2.1 through 4.2.13 discuss impacts of preconstruction,  
6 construction, and operation. Section 4.2.14 discusses the relative contributions of  
7 preconstruction and construction activities to the impacts assessed in each environmentally  
8 affected area. Potential accident impacts are covered in Section 4.2.15. Section 4.2.16  
9 discusses the decontamination and decommissioning impacts. Section 4.2.17 discusses the  
10 impacts of carbon dioxide and greenhouse gases. Potential terrorist activities are considered in  
11 Section 4.2.18.

#### 12 13 **4.2.1 Land Use Impacts**

14  
15 This section describes the potential impacts on land use during preconstruction, construction,  
16 and operation of the proposed EREF. Construction of a uranium enrichment facility such as the  
17 proposed EREF would alter the current land use, which consists primarily of agricultural and  
18 undeveloped rangeland. Land use impacts would result when project activities restrict future  
19 land use activities from occurring on or near the proposed facility or when the land use for the  
20 proposed project is not compatible with local, State, or Federal land use plans. Land use  
21 impacts could also occur if the activity restricts current or planned mineral resources  
22 exploitation. The proposed 240-hectare (592-acre) EREF site would be located entirely on  
23 private land. Proposed land uses on the property must comply with the zoning requirements of  
24 Bonneville County; and the county has zoned the location as G-1 Grazing, which allows for  
25 industrial development. This zoning is intended to allow certain activities that should be  
26 removed from population centers in the county (Serr, 2009). The operation of a uranium  
27 enrichment facility is consistent with the county's zoning. It is not anticipated that the proposed  
28 EREF preconstruction, construction, and operation would have any effect on the current land  
29 uses found on the surrounding Federal lands administered by the U.S. Bureau of Land  
30 Management (BLM) (Ennes, 2010). Land use impacts resulting from preconstruction,  
31 construction, and operation would be SMALL.

##### 32 33 **4.2.1.1 Preconstruction and Construction**

34  
35 Preconstruction and facility construction would result in the alteration of 240 hectares  
36 (592 acres) of land. Access to the 1700-hectare (4200-acre) property to be purchased by AES  
37 would be restricted beginning with preconstruction activities. It is probable that once  
38 preconstruction begins, all agricultural use on the proposed EREF property, including grazing  
39 and cultivation, would cease. However, similar land uses on surrounding lands would continue.  
40 As mentioned in Chapter 3, about 202 hectares (500 acres) on the proposed property are under  
41 cultivation. This area would no longer be used for agriculture, but this impact is not considered  
42 major due to the approximately 81,747 hectares (202,000 acres) of cultivated cropland found in  
43 Bonneville County (USGS, 2009). No other land uses could occur on the proposed property  
44 once preconstruction begins, other than those associated with the proposed EREF.

45  
46 There is a potential for ongoing agricultural activities in surrounding areas to be temporarily  
47 affected by fugitive dust generated during preconstruction and construction. These offsite land  
48 use impacts could be lessened through the application of measures for fugitive dust control,

1 which are discussed in Section 4.2.4.3. There is also the potential for preconstruction and  
2 construction activities to drive away some game species due to the increased activity on the  
3 proposed EREF site. This could affect successful hunting on surrounding lands because the  
4 preconstruction and construction activities would temporarily disturb game species such as  
5 pronghorn antelope, mule deer, and elk. However, these impacts on surrounding agriculture  
6 and local game would be temporary and would be SMALL.

7  
8 The impacts of alteration of current land uses and the potential for temporary offsite land use  
9 impacts to agriculture and hunting resulting from preconstruction and construction would be  
10 SMALL. The alteration of land use would begin with preconstruction of the proposed EREF,  
11 and would continue through completion of construction. The majority (about 90 percent) of  
12 impacts to land use would occur during preconstruction when most of the land disturbance  
13 would occur.

#### 14 15 **4.2.1.2 Facility Operation**

16  
17 Operation of the proposed EREF would restrict land use on the proposed EREF property to the  
18 production of enriched uranium (AES, 2010a). The 1700-hectare (4200-acre) property would no  
19 longer be open to grazing and cultivation and would remain vacant (AES, 2010a). Operation of  
20 the proposed EREF is not expected to affect land use on adjacent public lands  
21 (Reynolds, 2010). Land use impacts from operation would be SMALL.

#### 22 23 **4.2.1.3 Mitigation Measures**

24  
25 Mitigation measures would be employed to minimize any potential impacts on offsite land use  
26 from erosion or fugitive dust. The following best management practices (BMPs), which have  
27 been identified by AES, would mitigate short-term increases in soil erosion or fugitive dust  
28 (additional discussion is provided in Section 4.2.5.3, Geology and Soils) (AES, 2010a):

- 29 • minimize the construction footprint to the extent practicable
- 30
- 31 • limit site slopes to a horizontal-vertical ratio of four to one, or less
- 32
- 33 • use a sedimentation detention basin
- 34
- 35 • protect undisturbed areas with silt fencing and straw bales, as appropriate
- 36
- 37 • use site stabilization practices such as placing crushed stone on disturbed soil in areas of  
38 concentrated runoff
- 39
- 40 • water onsite construction roads at least twice daily, when needed, to control fugitive dust  
41 emissions and, after construction is complete, stabilize the site with natural low-water-  
42 consumption, low-maintenance landscaping and pavement
- 43
- 44

#### 45 **4.2.2 Historic and Cultural Resources Impacts**

46  
47 This section describes the potential environmental impacts on historic and cultural resources  
48 resulting from preconstruction, construction, and operation of the proposed EREF. Historic and



1 cultural resources include archaeological sites, historic structures, and places of cultural  
2 importance to groups for maintaining their heritage. Cultural resources are nonrenewable; that  
3 is, once altered, the information contained in cultural resources cannot be recovered. Impacts  
4 to cultural resources at the proposed EREF site would occur primarily during initial ground-  
5 disturbing activities. Some cultural resources could also be impacted by visual intrusions, in  
6 which case they are expected to occur primarily during construction and operation, as these are  
7 the actions that would most significantly affect the visual landscape through increased traffic  
8 and construction activities and the presence of an industrial complex. Impacts on historical and  
9 cultural resources from preconstruction, construction, and operation of the proposed EREF  
10 would range from SMALL to LARGE, although with the appropriate mitigation discussed below,  
11 the impacts would range from SMALL to MODERATE.

12  
13 The *National Historic Preservation Act of 1966*, as amended (NHPA), requires that all adverse  
14 effects to *National Register of Historic Places* (NRHP)-eligible historic and cultural resources be  
15 considered during Federal undertakings, such as the NRC licensing activity for the proposed  
16 EREF. A resource is considered eligible for listing on the NRHP by meeting at least one of the  
17 following four criteria (36 CFR 60.4): (1) association with an historic person, (2) association with  
18 an historic event, (3) representation of the work of a master, or (4) potential to provide  
19 information on the history or prehistory of the United States.

20  
21 Section 106 of the NHPA identifies the process for considering whether a project would affect  
22 significant cultural resources. The Area of Potential Effect for the Section 106 review for the  
23 proposed EREF project is the 240 hectares (592 acres) that would be directly affected by  
24 preconstruction and construction of the proposed EREF. The Section 106 process requires  
25 consultation between the lead Federal agency and the State Historic Preservation Office  
26 (SHPO), which is the custodian of information on cultural resources for the State. The  
27 Section 106 process also requires that Federally recognized Native American groups who have  
28 ancestral interest in the property should be consulted to determine if resources important to the  
29 tribe are present (36 CFR 800.2(4)(c)(ii)). For the proposed EREF project, Section 106  
30 consultations are currently in progress between NRC and the Idaho SHPO and between the  
31 NRC and the Shoshone-Bannock Tribes. The NRC has contacted the Idaho SHPO and the  
32 Shoshone-Bannock Tribes concerning the presence of historic and cultural resources in the  
33 areas of the proposed EREF site and of the route of the proposed electrical transmission line  
34 needed to power the proposed EREF (see Section 1.5.6.2 and Appendix B).

#### 35 36 **4.2.2.1 Preconstruction and Construction**

37  
38 The greatest potential for impacts on historic and cultural resources would occur during ground  
39 disturbance during preconstruction. No additional significant impacts on historic and cultural  
40 resources are anticipated during facility construction because nearly all of the ground-disturbing  
41 activities would have already occurred during preconstruction. The proposed 240-hectare  
42 (592-acre) EREF site area has been surveyed for the presence of historic and cultural  
43 resources. The surveys were documented in two reports that were provided to, and reviewed  
44 by, the Idaho SHPO (Ringhoff et al., 2008; Estes and Raley, 2009). They identified site  
45 MW004, the John Leopard Homestead, and indicated that this site may be eligible for  
46 nomination to the NRHP. The site, which is described in Section 3.3.4 of this EIS, is important  
47 for the information it could provide on the homesteading activities in the area.

48

1 The SHPO concurred with the evaluations and recommendations in the two survey reports and  
2 agreed that site MW004 is the only one of the 13 sites located in the proposed EREF site  
3 eligible for listing on the NRHP (Idaho SHPO, 2009). During scoping and in its comments on  
4 the Draft EIS, the Shoshone-Bannock Tribes indicated that it would like to be part of the cultural  
5 resource surveys of the proposed EREF site area (Shoshone-Bannock, 2009). The tribes  
6 issued no response to requests for information relevant to the cultural resources aspect of the  
7 proposed project during the consultation under Section 106 of the NHPA (see Appendix B,  
8 Section B.2).

9  
10 Site MW004 would be directly impacted by preconstruction activities at the proposed EREF site.  
11 Preconstruction activities would completely destroy this site because it would be under the  
12 footprint of the security fence and a proposed electrical substation for a proposed transmission  
13 line that would bring power to the proposed EREF. Therefore, AES prepared a treatment plan  
14 that detailed how it would mitigate site MW004 by professional excavation and data recovery  
15 prior to disturbing site MW004 during preconstruction activities (AES, 2010e). This treatment  
16 plan was provided to the Idaho SHPO for review, and the SHPO indicated its support for the  
17 proposed treatment of site MW004 (Idaho SHPO, 2010a).

18  
19 During preconstruction and construction activities, there is the possibility for unexpected  
20 discoveries of archaeological or human remains. Therefore, AES also commissioned the  
21 development of the *Archaeological Monitoring and Discovery Plan for the EREF, AES, in*  
22 *Bonneville County, Idaho* (Stoner et al., 2009), which specifies procedures for addressing and  
23 handling the unexpected discovery of human remains or archaeological material at the  
24 proposed EREF. This plan has also been provided to the Idaho SHPO.

25  
26 In a letter to the Idaho SHPO dated November 17, 2010, AES's archaeological consultant,  
27 Western Cultural Resource Management, Inc. (WCRM), provided a summary of its activities  
28 during the professional excavation of, and data recovery at, site MW004, which was conducted  
29 from October 5 to November 8, 2010 (WCRM, 2010). This mitigation serves to reduce the  
30 impact of the proposed EREF project on site MW004; however, the destruction of the site  
31 through formal professional excavation still is considered an adverse effect because the site no  
32 longer exists. In a letter dated November 26, 2010, the SHPO indicated that it had received and  
33 accepted the data recovery report (Idaho SHPO, 2010b). However, AES must receive a notice-  
34 to-proceed from the SHPO before initiating preconstruction activities in the area of site MW004.  
35 WCRM is preparing a report detailing the results of the excavations and an analysis of the  
36 information collected from the mitigation efforts (WCRM, 2010).

37  
38 Preconstruction and construction are not expected to impact the Wasden Complex  
39 (see Section 3.3.4 for a description of the Wasden Complex). The site is distant enough from  
40 the proposed EREF property that no effects from these activities are anticipated. Visual or  
41 noise impacts are possible, but the distance makes it unlikely that the Wasden Complex would  
42 be affected.

43  
44 Consultation among the NRC, the SHPO, the Shoshone-Bannock Tribes, and AES is ongoing.  
45 The NRC is developing a Memorandum of Agreement (MOA) with these parties. It is planned  
46 that the NRC, the SHPO, and AES will be signatories of the MOA. In addition, the Shoshone-  
47 Bannock Tribes has accepted the NRC's invitation to be a concurring party on the MOA (see  
48 Appendix B, Section B.2). The draft MOA addresses the completed mitigation of site MW004,

1 the completed X-ray fluorescence analysis of obsidian artifacts found at the proposed EREF site  
2 (Idaho SHPO, 2010a), and the survey by AES for historical and cultural resources of any  
3 previously un-surveyed areas that may be identified following final design. Also, the draft MOA  
4 references AES's unanticipated discoveries and monitoring plan (Stoner et al., 2009).

5  
6 The NRC staff initially considered that impacts on historic and cultural resources would be  
7 LARGE due to the destruction of site MW004 to accommodate preconstruction of the proposed  
8 EREF. However, since site MW004 was professionally excavated prior to ground disturbance in  
9 the area of this site, and because other examples of this particular homestead site type are  
10 found in the region (Gilbert, 2010), the impacts have been reduced to MODERATE. Impacts to  
11 other historic and cultural resources would be SMALL. The majority of impacts to historic and  
12 cultural resources would occur during preconstruction when most of the ground disturbances  
13 would occur; therefore, an estimated 90 percent of the impacts would be associated with  
14 preconstruction and only 10 percent with construction.

#### 15 16 **4.2.2.2 Facility Operation**

17  
18 No ground-disturbing activities are expected during operation of the proposed EREF. As a  
19 result, there is no potential for impacts on historic and cultural resources during operation.  
20 Operation is not expected to have any impact on the Wasden Complex because of its distance  
21 from the proposed EREF site. The greatest threat to the proposed site is unlawful collection of  
22 artifacts at the site by site workers; however, educating workers should minimize any effects.  
23 Therefore, impacts from operation would be SMALL.

#### 24 25 **4.2.2.3 Mitigation Measures**

26  
27 As discussed earlier, site MW004 was professionally excavated (with data recovery) by AES in  
28 accordance with a treatment plan supported by the SHPO (Idaho SHPO, 2010a). The Idaho  
29 SHPO received a summary of the data recovery efforts (WCRM, 2010) undertaken as mitigation  
30 (Idaho SHPO, 2010b). A report documenting the information discovered during the excavation,  
31 and an analysis of that information is being developed (WCRM, 2010). Any additional mitigation  
32 measures for historic and cultural resources, if needed, would be implemented through the  
33 *Archaeological Monitoring and Discovery Plan for the EREF, AES, in Bonneville County, Idaho*  
34 (Stoner et al., 2009) and the MOA that is being developed. The cultural resource mitigation  
35 measures identified by AES are listed below:

- 36  
37 • educate workers on the regulations governing cultural resources stressing that unauthorized  
38 collecting is prohibited.
- 39  
40 • use of onsite cultural resource monitors during construction activities
- 41  
42 • procedures to address unexpected discoveries of human remains or previously unidentified  
43 archaeological materials during ground-disturbing activities and procedures for the  
44 evaluation and treatment of these resources
- 45  
46 • cessation of construction activities in the area around any discovery of human remains or  
47 other item of archaeological significance and notification of the State Historic Preservation

1 Officer to make the determination of appropriate measures to identify, evaluate, and treat  
2 the discoveries

- 3 • treatment/mitigation plan for site MW004 (recommended eligible for inclusion in the NRHP)  
4 to recover significant information on that site (professional excavation and data recovery  
5 have been conducted)

### 7 **4.2.3 Visual and Scenic Impacts**

8  
9 This section discusses the potential visual and scenic impacts that could result from  
10 preconstruction, construction, and operation of the proposed EREF. Visual impacts result when  
11 contrasts are introduced into a visual landscape. The current visual setting of the proposed  
12 EREF site is cultivated and undeveloped rangeland. The greatest potential for visual impacts  
13 would be expected from operation of the proposed EREF, as this would represent a long-term  
14 alteration of the existing landscape. Impacts on visual and scenic resources from  
15 preconstruction, construction, and operation of the proposed EREF would range from SMALL to  
16 MODERATE.

17  
18 Visual impacts are often difficult to characterize due to the subjective nature of what is a  
19 concern visually. Opinions can vary widely on what is visually acceptable and whether it can  
20 enhance or detract from a visual setting. The BLM has developed an effective Visual Resource  
21 Management (VRM) System (BLM, 2007). This system relies on two main components: visual  
22 resource inventories (VRIs) and visual resource management. VRIs consider the base line  
23 visual characteristics of a location. VRM is a management decision by the BLM to either  
24 preserve a visual setting or to focus on resources other than visual resource considerations for  
25 a location. A more detailed discussion of this process is provided in Section 3.2. The visual  
26 resource impact discussion that follows relies on the terminology and concepts from the BLM  
27 VRM System.

28  
29 BLM manages the visual resources on BLM lands in the area surrounding the proposed EREF,  
30 as illustrated in Figure 4-1 and described below. BLM has designated the public lands that  
31 immediately surround the proposed EREF property as VRM Class II. This designation reflects  
32 BLM's determination that the lands have scenic quality and that BLM will manage the lands to  
33 maintain the current visual character. Most of the BLM land south of US 20 (e.g., Hell's Half  
34 Acre WSA) is designated by BLM as VRM Class I. VRM I areas are managed to preserve the  
35 visual character with no new visual intrusions permitted. Also, in this region, some of the land  
36 that immediately borders US 20 is managed by BLM. The land along the highway is designated  
37 as VRM III. In VRM III areas, BLM is not trying to preserve the current visual setting.

#### 39 **4.2.3.1 Preconstruction and Construction**

40  
41 Preconstruction activities would be concentrated in the proposed EREF site area. Visual  
42 impacts could result along US 20 from the increased activity at the proposed site. Fugitive dust  
43 from preconstruction activities could also create visual impacts along US 20. These impacts  
44 would be of relatively short duration, with all activities occurring during daylight hours. The  
45 clearing of vegetation and installation of a perimeter fence would change the visual setting;  
46 however, they would not significantly alter the overall appearance of the area. The vehicular  
47 traffic associated with preconstruction would not be a permanent feature of the proposed  
48 project. The Wasden Complex a significant archaeological site located 1.6 km (1 mile) from the



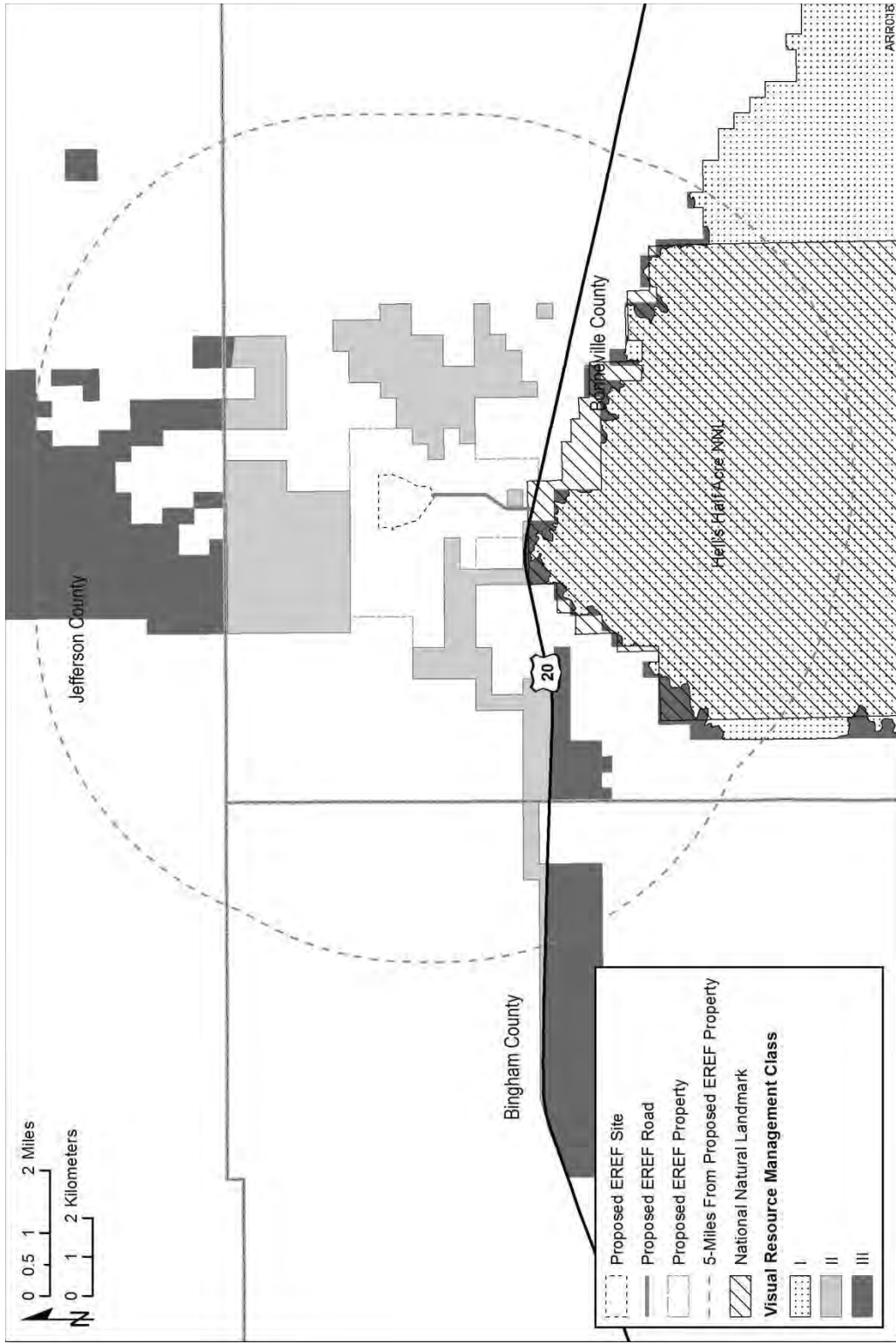


Figure 4-1 VRM Classes in the Area Surrounding the Proposed EREF Site



1 EREF site could also be impacted visually by preconstruction and construction  
2 (see Section 3.3.4 for a description of the Wasden Complex). An intervening ridgeline, would  
3 largely shield these activities from the site. Visual impacts associated with preconstruction  
4 would be SMALL.  
5

6 Facility construction activities would involve erecting permanent buildings. The impact of such  
7 permanent structures is discussed in the following section on facility operation. The current  
8 visual landscape does not include any industrial structures of the types proposed for the  
9 proposed EREF. Industrial buildings are present at the Idaho National Laboratory (INL), but are  
10 not visible from the proposed EREF site. Facility construction activities would begin to introduce  
11 visual intrusions that are out of character with the surrounding region. The vehicular traffic  
12 associated with construction would not be a permanent feature of the plant. These activities  
13 would have an effect on the visual landscape; however, much of the activity associated with  
14 construction would end once construction was complete. Construction activities would not be  
15 expected to affect the Wasden site because the activities would be screened by an intervening  
16 ridgeline. Construction of the proposed facility may negatively affect the visual setting as  
17 perceived by visitors to Hell's Half Acre WSA. Construction activities would be partially visible  
18 from portions of Hell's Half Acre WSA. However, the security lighting required at the facility  
19 would result in the greatest impact due to it being visible to night users of Hell's Half Acre WSA  
20 (e.g., campers).  
21

22 Visual impact levels associated with construction would range from SMALL to MODERATE.  
23 The majority of the impacts on visual and scenic resources would occur during construction  
24 (80 percent) when the taller built features are constructed; impacts associated with  
25 preconstruction are largely the result of increased activity (20 percent).  
26

#### 27 **4.2.3.2 Facility Operation**

28

29 The operation of the proposed EREF would have an effect on the overall visual setting of the  
30 area. The operation of a uranium enrichment facility would represent a significant visual  
31 departure from the existing visual setting. No developments of the type being proposed are  
32 currently visible near the proposed EREF site. The operation of the proposed facility would,  
33 using the BLM VRM System, be expected to lower the VRI value for the area of the proposed  
34 project. Based on the BLM VRI process, the visual landscape would be affected due to  
35 (1) sensitivity of the location for visual intrusions, (2) scenic qualities of the location, and  
36 (3) distances from which the location would be viewed (see Section 3.4 for a discussion of the  
37 VRI process). The area of the proposed project is presumed to have high sensitivity for  
38 recreational users, but lower sensitivity to the INL employees and farmers who use US 20. The  
39 scenic quality of the area is low, and the main viewing distance is roughly 2.4 kilometers  
40 (1.5 miles) away on US 20, which puts the proposed EREF site at a distance where intrusions  
41 are visible. Based on the BLM system, the impact level for operation of the plant is linked to its  
42 effect on the VRI class. BLM has indicated that the plant would reduce the relative visual value  
43 of the area (Boggs, 2010).  
44

45 The Wasden Complex could be visually affected by the operation of the EREF. Due to an  
46 intervening ridgeline, only the top portions of the buildings would be visible from the Wasden  
47 Complex. Because only a portion of the complex would be visible, the operation of the EREF is  
48 not expected to visually affect the Wasden Complex.  
49

1 Another factor to be considered in assessing the visual effect of operating a plant of this sort is  
2 the introduction of light pollution at night. Lights are perceivable over great distances in open  
3 environments like the vicinity of the proposed EREF site. The most sensitive locations where  
4 lights from the proposed EREF could be perceivable are at the trailhead for Hell's Half Acre  
5 Wilderness Study Area (WSA) located less than 3.5 kilometers (2 miles) south of the proposed  
6 EREF and from Craters of the Moon National Park located 72 kilometers (45 miles) to the west  
7 (NPS, 2009). The perimeter lighting for the plant would be plainly visible to campers at the  
8 Hell's Half Acre Twenty Mile Lava Trail trailhead where camping is permitted. Data is available  
9 from the National Park Service (NPS) for perception of the light dome from Craters of the Moon  
10 National Park (NPS, 2010). The NPS data show that the light from Idaho Falls is visible from  
11 the park. While the proposed EREF site is 20 miles closer to the park, it is a significantly  
12 smaller light source, and therefore is not expected to generate sufficient light that it would be  
13 perceivable from Craters of the Moon National Park.  
14

15 The majority of those who would see the new plant are workers at INL who are not using the  
16 area for its visual qualities. The INL workers are the main group of commuters on US 20.  
17 Operation of the proposed facility may negatively affect the visual setting as perceived by  
18 visitors to Hell's Half Acre WSA. Operation would reduce the quality of the recreational  
19 experience for campers at the Hell's Half Acre trailhead for the duration of the proposed license.  
20 Additionally, operation would have an adverse impact on wilderness values at the Hell's Half  
21 Acre WSA because opportunities for solitude would be reduced due to the facility being within  
22 sight of user portions of the WSA. The impact would be greatest at night when artificial light is  
23 in use. Based on the NRC staff's review, the impact of operation of the proposed EREF on  
24 visual resources in the area of the proposed project would be MODERATE.  
25

#### 26 **4.2.3.3 Mitigation Measures**

27  
28 Several mitigation measures have been identified by AES to reduce the effect of the proposed  
29 project on visual and scenic resources (AES, 2010a). They include the use of accepted natural  
30 low-water-consumption landscaping techniques using native landscape plantings on bare areas  
31 on the perimeter of the proposed EREF to limit any potential visual impacts, and the use of  
32 crushed stone in areas where planting is not viable. Revegetation would occur as quickly as  
33 possible during construction. Painting the proposed facility in colors that would blend with the  
34 surrounding vegetation could also reduce the contrast between the proposed EREF plant and  
35 the surrounding landscape. Creation of earthen berms or other types of visual screens made of  
36 other natural material would also help reduce the visibility of the proposed facility. To minimize  
37 light pollution, all perimeter lights would be downfacing (AES, 2010a).  
38

#### 39 **4.2.4 Air Quality Impacts**

40  
41 Air quality impacts from the operation of construction equipment during preconstruction and  
42 facility construction were evaluated based on the construction schedules and parameters  
43 provided by AES (AES, 2010a). U.S. Environmental Protection Agency (EPA)-approved  
44 algorithms were applied to estimate emissions, and EPA-approved dispersion models were  
45 used to estimate ambient air concentrations of criteria pollutants at the proposed EREF property  
46 boundary under expected meteorological conditions. The impacts of travel to and from the  
47 EREF property by the construction workforce as well as truck deliveries of equipment and  
48 materials to the proposed EREF site were included in the evaluation. Air quality impacts during

1 operation of the proposed EREF from the anticipated release of certain chemicals, the periodic  
2 operation of certain pieces of equipment such as emergency generators, and the potential  
3 release of uranium hexafluoride (UF<sub>6</sub>) from the Cascade Halls were also evaluated. The NRC  
4 staff concludes that impacts on ambient air quality from preconstruction and construction would  
5 be SMALL for all hazardous air pollutants (HAPs) and all criteria pollutants except particulates,  
6 but may be MODERATE to LARGE for particulates during certain preconstruction periods and  
7 activities, despite application of mitigation measures. However, such impacts are expected to  
8 be the result of fugitive dust generation and to occur only when fugitive dust-generating  
9 activities are actually occurring. The NRC staff further concludes that impacts on ambient air  
10 quality from the routine operation of the proposed EREF would be SMALL with respect to all  
11 criteria pollutants and all HAPs.  
12

#### 13 **4.2.4.1 Preconstruction and Construction**

14  
15 The NRC staff anticipates that air quality impacts may occur as a result of preconstruction and  
16 construction. Criteria pollutants would be generated as a result of the onsite operation of  
17 construction vehicles and equipment burning fossil fuels in internal combustion engines and  
18 from the operation of delivery vehicles and workforce transport vehicles traveling to and from  
19 the site. Lesser amounts of criteria pollutants may be released from the operation of heating  
20 systems using external combustion sources such as boilers or furnaces. Releases of volatile  
21 organic compounds (VOCs) (nonmethane hydrocarbons) may result from many onsite activities,  
22 including the onsite storage and/or dispensing of vehicle and equipment fuels, the use of  
23 cleaning solvents, and the applications of paints and corrosion-control coatings. Lesser  
24 amounts of VOCs may be released from the storage and use of fossil fuels for comfort heating  
25 and from the use of various industrial gases for welding, brazing, and other construction-related  
26 activities. Fugitive dust may result from the disturbance of the ground surface during cut-and-fill  
27 activities, excavations for foundations and footings, burial of utilities, construction of onsite  
28 roads, operation of an onsite concrete batch plant (including delivery, storage, and handling of  
29 sand, aggregate, and cement), and travel of construction vehicles on bare ground or on  
30 unpaved onsite roads. Lesser amounts of fugitive dust may result from wind erosion of bare  
31 ground.  
32

33 Amounts of pollutants generated and released as a result of the above-noted activities would be  
34 functions of the scope and duration of each activity, circumstantial factors such as soil types,  
35 extant pollution-control devices, prevailing meteorological conditions, and mitigations resulting  
36 from the application of BMPs and appropriate controls. Although AES has not yet developed  
37 and submitted a detailed construction plan and schedule, sufficient details have been provided  
38 to derive a reasonable approximation of the air quality impacts that may result from  
39 preconstruction and construction. A similar array of assumptions and air impact-related  
40 parameters was developed by AES and provided in the EREF Environmental Report (ER)  
41 (AES, 2010a) and in supplementary information (AES, 2009b).  
42

43 The NRC staff evaluated the assumptions and tentative schedules used by AES in estimating  
44 construction-related air impacts and, with exceptions noted below, found them to be reasonable,  
45 generally conservative, and appropriate representations of expected activities necessary and  
46 sufficient to support construction-related air impact analyses. Relevant parameters for  
47 construction activities proposed by AES are also consistent with industrial construction activities  
48 representative of EREF preconstruction and construction. Consequently, with the exception of

1 expected reductions in fugitive dust from mitigation efforts (see below), AES's proposed  
 2 construction-related parameters and schedules were used to form the basis for an assessment  
 3 of air quality impacts.

4  
 5 The air emission model MOBILE 6.2, published by EPA (EPA, 2003), was used to estimate unit  
 6 emissions of criteria pollutants from vehicles and equipment using fossil fuels in internal  
 7 combustion engines (both compression-ignition [diesel] and spark-ignition engines). The NRC  
 8 staff determined that the complement of construction support vehicles and construction vehicles  
 9 and equipment proposed by AES was reasonable for the construction tasks at hand.  
 10 Consequently, the number and type of vehicles proposed by AES were used to define the  
 11 MOBILE 6.2 modeling inputs. Results for unit emission rates and daily emissions from  
 12 construction support vehicles and construction vehicles and equipment as calculated by the  
 13 NRC are displayed in Tables 4-1 and 4-2, respectively.

14  
 15 Supplemental information submitted by AES provide details of the onsite vehicle fuel storage  
 16 and dispensing activities that would be occurring onsite during preconstruction and construction  
 17 (AES, 2009b). Gasoline and diesel fuel would each be stored onsite in 2000-gallon  
 18 aboveground steel tanks, each enclosed in reinforced concrete and each equipped with a  
 19 5-gallon overfill protection feature. Estimated throughputs during construction include  
 20 1325 liters (350 gallons) of gasoline per week and 37,854 liters (10,000 gallons) of diesel fuel  
 21 per week. Assuming that design features that control releases of nonmethane VOCs are  
 22 functional and BMPs are employed in the storage and dispensing of fuels (see Section 4.2.4.3),  
 23 algorithms published in EPA AP-42, Fifth Edition, Volume 1, Chapter 7.1 (EPA, 2006a), and the  
 24 EPA TANKS computer program (Version 4.09) (EPA, 2006b) predict VOC losses of  
 25 312 kilograms (688 pounds) per year during construction. Because each of the tanks has a  
 26

**Table 4-1 NRC's Estimated Emissions of Criteria Pollutants from Construction Support Vehicles**

Vehicle Type	Emission Factor g/km (g/mi)	Number in Operation <sup>a</sup>	Daily Estimated Mileage km (mi) <sup>a</sup>	Daily Emissions g (lb)	Workday Emission Rate g/s (lb/hr)
<b>Carbon monoxide</b>					
Light-duty vehicle	13.31 (21.41)	40	16.1 (10)	8572 (18.90)	0.238 (1.890)
Light-duty truck I	15.55 (25.03)	53	16.1 (10)	13,269 (29.25)	0.369 (2.925)
Light-duty truck II	15.60 (25.10)	4	16.1 (10)	1005 (2.22)	0.028 (0.222)
Heavy-duty truck	2.80 (4.50)	3	16.1 (10)	135 (0.30)	0.004 (0.030)
Totals				22,981 (50.67)	0.638 (5.066)
<b>Nitrogen oxides</b>					
Light-duty vehicle	0.66 (1.07)	50	16.1 (10)	425 (0.94)	0.018 (0.143)
Light-duty truck I	0.69 (1.12)	53	16.1 (10)	589 (1.30)	0.016 (0.130)
Light-duty truck II	0.88 (1.42)	4	16.1 (10)	57 (0.13)	0.002 (0.013)
Heavy-duty truck	5.82 (9.37)	3	16.1 (10)	2.81 (0.62)	0.094 (0.744)
Totals				1352 (2.99)	0.130 (1.029)

<sup>a</sup> Source: AES, 2010a.

**Table 4-2 NRC's Estimated Emissions of Criteria Pollutants from Construction Vehicles and Equipment<sup>a,b</sup>**

Equipment	Number	Workday Emission Rate in g/s (lb/hr)			
		Carbon Monoxide	Nitrogen Oxides	Sulfur Oxides	Particulates <sup>c</sup>
Wheeled tractor	1	0.006 (0.044)	0.015 (0.116)	0.001 (0.007)	0.001 (0.001)
Grader	4	0.021 (0.170)	0.057 (0.450)	0.004 (0.028)	0.001 (0.004)
Pans	5	0.023 (0.185)	0.058 (0.462)	0.004 (0.028)	0.001 (0.005)
Wheeled loader	8	0.440 (0.350)	0.117 (0.932)	0.007 (0.057)	0.001 (0.008)
Bulldozer	5	0.080 (0.633)	0.048 (0.380)	0.007 (0.056)	0.002 (0.015)
Dump truck	20	0.319 (2.531)	0.191 (1.519)	0.028 (0.225)	0.008 (0.060)
Roller	6	0.005 (0.041)	0.151 (1.197)	0.007 (0.056)	0.002 (0.013)
Water truck	4	0.022 (0.175)	0.059 (0.466)	0.004 (0.028)	0.001 (0.004)
Backhoe	9	0.036 (0.289)	0.094 (0.749)	0.006 (0.049)	0.001 (0.010)
25-ton crane	3	0.037 (0.295)	0.095 (0.757)	0.004 (0.032)	0.001 (0.008)
>25-ton crane	4	0.064 (0.506)	0.038 (0.304)	0.006 (0.045)	0.002 (0.012)
Manlift	16	1.119 (8.877)	0.061 (0.487)	0.002 (0.016)	0.002 (0.001)
Telehandler	5	0.350 (2.774)	0.019 (0.152)	0.001 (0.005)	0.001 (0.004)
Concrete truck	9	0.145 (1.139)	0.086 (0.684)	0.013 (0.101)	0.003 (0.027)
Concrete pumper truck	3	0.016 (0.128)	0.043 (0.388)	0.003 (0.021)	0.001 (0.003)
Miscellaneous	9	0.629 (4.994)	0.035 (0.274)	0.001 (0.001)	0.001 (0.001)
<b>Total</b>	<b>111</b>	<b>2.914 (23.129)</b>	<b>1.167 (9.263)</b>	<b>0.097 (0.766)</b>	<b>0.022 (0.173)</b>

<sup>a</sup> Data displayed are the result of the application of MOBILE 6.2 to EREF construction period parameters.

<sup>b</sup> Some rounding errors exist.

<sup>c</sup> Does not include particulates released as fugitive dust.

1  
2 capacity of less than 37,854 liters (10,000 gallons), dispenses fuels with vapor pressures less  
3 than 80 mm of Hg @ 21°C, and is equipped with appropriate VOC controls, Idaho regulations  
4 categorize the tanks as insignificant sources (see IDAPA 58.01.01 Part 317.01(b)(i)(3)). The  
5 NRC staff concludes that VOC releases associated with the onsite storage and dispensation of  
6 vehicle fuels during preconstruction and construction would have a SMALL impact on air quality.  
7

8 Fugitive dust from a variety of sources is a notable air impact from construction. Specific  
9 emission factors have been established for fugitive dust resulting primarily from vehicle travel on  
10 unpaved onsite roads (EPA, 2006c), cut-and-fill operations, aggregate handling and storage  
11 piles (EPA, 2006d), and other activities typically associated with heavy construction  
12 (EPA, 1995). EPA has also adopted guidance on adjusting emission factors to reflect local  
13 conditions in order to estimate PM<sub>10</sub> (particulate matter ≤10 micrometers in aerodynamic  
14 diameter) and PM<sub>2.5</sub> (particulate matter ≤2.5 micrometers in aerodynamic diameter) fractions of  
15 fugitive dust generated (MRI, 2006). Particle size distribution of fugitive dust depends on a



1 number of factors, particularly the silt and moisture contents of the impacted soils. Although the  
2 proposed EREF site is characterized broadly as a semiarid environment where soils typically  
3 have low silt content, available information indicates silt content of soils on the site to be as high  
4 as 70 percent (NRCS, 2009). Correction factors published by EPA that allow estimation of PM<sub>10</sub>  
5 and PM<sub>2.5</sub> fractions of total suspended particulates (generally accepted to be represented as  
6 PM<sub>30</sub>, which is particulate matter ≤30 micrometers in aerodynamic diameter) were derived from  
7 analyses of the behavior of soils with silt content no higher than 30 percent. For such soils,  
8 EPA guidance suggests that the modeled value of pounds of particulate per vehicle miles  
9 traveled (VMT) be multiplied by correction factors of 0.306 and 0.0306 to estimate PM<sub>10</sub> and  
10 PM<sub>2.5</sub> fractions, respectively (MRI, 2006). However, EPA has not published correction factors  
11 for soils with exceptionally high silt content such as those present at the proposed EREF  
12 property; consequently, no additional corrections beyond those noted above are introduced in  
13 estimating PM<sub>10</sub> and PM<sub>2.5</sub> fractions for indigenous soils at the proposed EREF site. To  
14 estimate fugitive dust generation, the NRC assumed an average rate of fugitive dust emissions  
15 of 1.2 tons per acre per month and an average daily disturbed acreage (i.e., active construction  
16 zone as indicated by AES) to be 89.4 hectares (221 acres). Without the introduction of any  
17 mitigative controls, this would result in estimated uncontrolled releases of PM<sub>10</sub> at a rate of  
18 97.3 grams per second (773.2 pounds per hour) and PM<sub>2.5</sub> of 9.7 grams per second  
19 (77.3 pounds per hour) over the construction hours of operation (10 hours per day for 21 days  
20 per month).

21  
22 As noted above, the moisture content of the soils on unpaved roads plays a significant role in  
23 the rate of fugitive dust generation. AES has committed to a mitigative strategy that involves  
24 watering onsite roads at least twice a day. AES estimates that such a watering schedule would  
25 result in a 90 percent reduction in fugitive dust generated. However, EPA estimates that  
26 achieving a 90 percent reduction in fugitive dust would require maintaining the soil moisture  
27 content ratio, M,<sup>1</sup> well over 4.0 (see Figure 13.2.2-2 of EPA, 2006c). Given the high silt content  
28 of the soils, moisture levels that high could be expected to cause the roads to become safety  
29 hazards and even impassable in some cases. Instead, it is more reasonable to expect that a  
30 watering strategy that maintains a value for M of approximately 2.0 would be an appropriate  
31 compromise between mitigating fugitive dust to the greatest extent practical and avoiding  
32 hazardous road conditions. At an M value of approximately 2.0, a fugitive dust reduction of  
33 75 percent would be anticipated. However, this analysis does not preclude additional mitigative  
34 measures such as use of alternative dust control techniques in addition to watering that would  
35 effect a greater reduction in fugitive dust without compromising safety. Additional mitigation  
36 options that could contribute to further reductions in fugitive dust generation are discussed in  
37 Section 4.2.4.3. A 75 percent reduction in uncontrolled fugitive dust results in controlled fugitive  
38 dust releases of PM<sub>10</sub> at a rate of 24.3 grams per second (193.3 pounds per hour) and PM<sub>2.5</sub> of  
39 4.9 grams per second (38.7 pounds per hour).

40  
41 The EREF development plan states that four 2500-watt diesel-fueled emergency generators  
42 and two smaller diesel-fueled generators not related to construction but intended to support  
43 facility operation would become operational while the construction phase is still ongoing  
44 (AES, 2010a). Once installed, these generators would be enrolled in a preventative

---

<sup>1</sup> The moisture content ratio, M, is defined as the ratio of the moisture content of a watered roadway to that of an unwatered roadway (i.e., the roadway in a representative natural condition). It essentially represents the percentage of soil pore spaces that are filled with water.

1 maintenance protocol that requires their operation for an average of 1.6 hours per week,  
2 52 weeks per year. Therefore, these generators would release criteria pollutants during both  
3 the construction and operation phases. However, none of the generators is expected to be  
4 used to provide power to support construction-related activities. To ensure the estimated  
5 impacts are conservative, emission calculations presume all six generators have nameplate  
6 ratings of 2500 watts. The generators would be exempt from permit requirements under a  
7 Category II Exemption as provided for in Section 222(01)(d) of Idaho air pollution rules  
8 (IAC, 2010). The generators would burn ultra-low-sulfur diesel fuel, the only diesel fuel  
9 expected to be available in the area through commercial vendors. Using the preventative  
10 maintenance schedule suggested by the equipment manufacturer and applying appropriate  
11 EPA-published algorithms reflective of the above assumptions, the estimated air quality impacts  
12 of the generators include: the generation of 61 kilograms per year (0.067 tons per year) of PM<sub>10</sub>,  
13 8437 kilograms per year (9.3 tons per year) of nitrogen oxides (NO<sub>x</sub>), 726 kilograms per year  
14 (0.080 ton per year) of carbon monoxide (CO), and 168 kilograms per year (0.185 ton per year)  
15 of nonmethane VOCs (AES, 2010a). Annual impacts of the above magnitude would continue  
16 throughout the operating phase of the proposed EREF and may increase if any of the  
17 generators are called into service to provide emergency power.  
18

19 On June 17, 2009, AES submitted a request to the NRC for an exemption from 10 CFR  
20 requirements governing commencement of certain preconstruction activities. As granted by the  
21 NRC (NRC, 2010a), the exemption allows AES to undertake certain preconstruction activities  
22 prior to NRC completing its environmental review and issuing a materials license for the EREF.  
23 Activities covered under the exemption include preconstruction actions such as clearing the site;  
24 site grading and erosion control; excavating the site (including rock blasting and removal, if  
25 required); installing parking areas, stormwater control features, and utilities; and constructing  
26 permanent highway access roads, onsite roads, buildings, offices, and other structures not  
27 subject to NRC licensing authority and not radiation safety-related.  
28

29 Collectively, the identified preconstruction activities would constitute the majority of air quality  
30 impacts associated with preconstruction and construction. The construction activities that would  
31 remain to be addressed under the NRC license include construction of the Separation Building  
32 Modules (SBMs) and installation of centrifuges and their monitoring and emission-control  
33 systems. Because these remaining construction actions can be expected to occur on a  
34 relatively small disturbed land area and utilize a reduced construction workforce, and with the  
35 major pollutant-emitting activities being completed under the exemption, the NRC staff  
36 concludes that the identified preconstruction activities would constitute as much as 90 percent  
37 of the overall impacts expected from preconstruction and construction combined. Further,  
38 commencement of the identified preconstruction activities would coincide with cessation of  
39 agricultural activities on the site, thus eliminating the seasonal air quality impacts associated  
40 with the agricultural activities (e.g., fugitive dust from field cultivation and criteria pollutant  
41 releases from operating farm vehicles and equipment).  
42

43 Average emissions of criteria pollutants and fugitive dust for a typical construction workday are  
44 shown in Table 4-3. The estimated emissions, adjusted for local conditions, and the relevant  
45 most recently available meteorological data from the National Weather Service (NWS) were  
46 used as inputs to the EPA-approved air dispersion model, AERMOD, to estimate air quality

**Table 4-3 NRC's Estimated Daily Emissions during Preconstruction and Construction**

Pollutant	Total Workday Average Emissions g/s (lb/hr)	Notes
<b>Vehicle emissions</b>		
Hydrocarbons	0.34 (2.67)	<ul style="list-style-type: none"> <li>• Includes contributions from diesel emergency generators installed during construction and enrolled in a preventative maintenance program.</li> <li>• Particulates from vehicle exhaust are assumed to be PM<sub>2.5</sub>.</li> </ul>
Carbon monoxide	3.55 (28.19)	
Nitrogen oxides	1.30 (10.29)	
Sulfur oxides	0.10 (0.77)	
Particulates	0.02 (0.17)	
<b>Fugitive dust</b>		
PM <sub>10</sub>	24.3 (193.1)	<ul style="list-style-type: none"> <li>• Assumes a 75 percent reduction in fugitive dust from unpaved roads as a result of twice/day watering mitigations and maintenance of a moisture content ratio of 1.75.</li> <li>• Assumes an average daily disturbed acreage of 221 acres and a 10-hour workday for 21 days each month.</li> <li>• Assumes an uncontrolled fugitive dust emission rate of 1.2 tons/acre/month.</li> <li>• Assumes fine particle size ratios of 1.5/4.9 for PM<sub>10</sub> and 0.15/4.9 for PM<sub>2.5</sub> with respect to PM<sub>30</sub>.</li> </ul>
PM <sub>2.5</sub>	2.43 (19.3)	

1  
2 impacts of the preconstruction and construction phases of the proposed EREF.<sup>2</sup> Local  
3 meteorological data from the NWS meteorological station located at the Idaho National  
4 Laboratory's Materials and Fuels Complex (identified in NWS databases as the MFC station) for  
5 the period calendar year (CY) 2005 through CY 2008 and upper-level data from the NWS  
6 Automated Surface Observing Systems station located at the Boise International Airport  
7 (the closest station to the proposed EREF at which upper-level data are recorded) collected  
8 over the same period were used as meteorological data inputs. Data from the Pocatello  
9 Municipal Airport NWS station over the same time frame were used to fill gaps in the MFC data,  
10 pursuant to the AERMOD model.

11  
12 To determine whether the estimated emission levels would cause an exceedance of an ambient  
13 air quality standard, the modeled results were added to existing ambient air quality data  
14 representative of background conditions, and the sum was compared to the National Ambient  
15 Air Quality Standards (NAAQS) (see Table 3-12). The ambient air monitoring network in Idaho  
16 is maintained by the Idaho Department of Environmental Quality (IDEQ). Not all criteria  
17 pollutants are monitored at each authorized monitoring station, and there is no monitoring  
18 station close to the proposed EREF site. Therefore, the NRC staff selected the monitoring  
19 stations closest to the EREF site for each criteria pollutant. It is important to note that the

<sup>2</sup> Details of the model and the methodology for its application are presented in Appendix C. Additional descriptive information is available from the EPA Web site at [http://www.epa.gov/scram001/dispersion\\_prefrec.htm#aermod](http://www.epa.gov/scram001/dispersion_prefrec.htm#aermod).

1 closest monitoring station for particulates is in an urban setting in Pocatello. That monitoring  
2 location was determined to have a similar geographic setting to the proposed EREF site, and  
3 thus was expected to experience similar meteorological conditions over time, especially with  
4 respect to wind speeds and directions. However, because that monitoring station is in an urban  
5 setting, the potential sources of particulate emissions would be different from those expected  
6 from the proposed EREF's rural and agricultural setting, and the Pocatello particulate monitor  
7 may not capture seasonal peaks in airborne particulates associated with agricultural activities.  
8 Thus, the monitoring results from the Pocatello station may underrepresent background  
9 particulate values at the EREF site, which is surrounded by cultivated fields. However, since no  
10 monitoring data collected in an Idaho agricultural setting was available from which to assess the  
11 magnitude of the impact agricultural activities could have on particulate values, no attempt was  
12 made to introduce correction factors reflective of these acknowledged differences. Further, EPA  
13 guidance regarding the application of AERMOD does not require that quantitative corrections be  
14 made for unique circumstantial factors or events but does recommend consideration of such  
15 factors in interpreting modeling results (EPA, 2005a). The highest values for each criteria  
16 pollutant for calendar years 2006 and 2007 were identified, and the higher of the two values was  
17 selected as a conservative representation of the background concentration for each criteria  
18 pollutant at the proposed EREF site. Selected background ambient air quality data for the  
19 impact assessment are displayed in Table 4-4.

20  
21 Results of AERMOD modeling are displayed in Table 4-5. The results suggest that over the  
22 preconstruction and construction phases, the NAAQS for both PM<sub>10</sub> and PM<sub>2.5</sub> may be exceeded  
23 at the boundary of the proposed EREF property during certain meteorological conditions when  
24 actions to mitigate the release of fugitive dust from unpaved onsite roads are limited to twice-  
25 per-day watering to the extent necessary to effect a 75 percent reduction. Modeled results at  
26 the proposed EREF property boundary show 24-hour PM<sub>10</sub> and PM<sub>2.5</sub> concentrations to be as  
27 high as 271.5 percent and 105.3 percent of their respective standards while all other NAAQS  
28 are satisfied. It must be noted, however, that meteorological data for the MCF station obtained  
29 from the NWS and used in the AERMOD model included wind speed data as low as  
30 0.134 meter (5.3 inches) per second, reflecting the sensitivity of the wind speed monitoring  
31 instrument used at the NWS MCF weather station. Evaluation of the modeling data suggests  
32 that exceedance of the ambient air quality standard for particulates at the proposed EREF  
33 property boundary would occur primarily during periods of very low wind speed, as might  
34 typically occur during the early morning hours over the spring and summer seasons.

35  
36 EPA recognizes that the manner in which AERMOD conceptualizes fugitive dust dispersion at  
37 low wind speeds and evaluates impacts from low-level (i.e., ground-level) sources introduces  
38 some bias that may result in overpredictions of near-field impacts during such conditions.  
39 Independent studies are ongoing designed to demonstrate the impacts of possible modeling  
40 bias (Paine and Connors, 2009). Nevertheless, the current EPA guidance does not provide the  
41 opportunity for corrections to reflect possible low wind speed bias, and actual observed wind  
42 speeds must be used as inputs to the model when they are available. While the modeled  
43 concentrations in Table 4-5 should be viewed as representative of preconstruction and  
44 construction impacts, some consideration of possible bias is appropriate. In order to evaluate  
45

**Table 4-4 Background Ambient Air Quality at Monitoring Stations Closest to the Proposed EREF Site**

Pollutant	Averaging Period	Closest Monitoring Station	Station ID	Measured Ambient Background Concentrations		Selected Background Concentration
				2006	2007	
Carbon monoxide	1-hour	Eastman Building 166 N. 9th Street Boise, ID	160010014	3.5 ppm	4.3 ppm	4.3 ppm
Carbon monoxide	8-hour	Eastman Building 166 N. 9th Street, Boise, ID	160010014	2.1 ppm	1.6 ppm	2.1 ppm
Nitrogen dioxide	Annual	N. of Lancaster Road Hayden, ID	160550003	11.3 µg/m <sup>3</sup>	11.3 µg/m <sup>3</sup>	11.3 µg/m <sup>3</sup>
Sulfur dioxide	3-hour	Sewage treatment plant Batiste and Chubbuck Roads Pocatello, ID	160050004	159.7 µg/m <sup>3</sup>	133.5 µg/m <sup>3</sup>	159.7 µg/m <sup>3</sup>
Sulfur dioxide	24-hour	Sewage treatment plant Batiste and Chubbuck Roads Pocatello, ID	160050004	62.8 µg/m <sup>3</sup>	62.8 µg/m <sup>3</sup>	62.8 µg/m <sup>3</sup>
Sulfur dioxide	Annual	Sewage treatment plant Batiste and Chubbuck Roads Pocatello, ID	160050004	13.1 µg/m <sup>3</sup>	15.7 µg/m <sup>3</sup>	15.7 µg/m <sup>3</sup>
Particulate PM <sub>10</sub>	24-hour	G&G Corner of Garret and Gould Pocatello, ID	160050015	52 µg/m <sup>3</sup>	45 µg/m <sup>3</sup>	52 µg/m <sup>3</sup>
Particulate PM <sub>10</sub>	Annual	G&G Corner of Garret and Gould Pocatello, ID	160050015	21 µg/m <sup>3</sup>	22 µg/m <sup>3</sup>	22 µg/m <sup>3</sup>
Particulate PM <sub>2.5</sub>	24-hour	G&G Corner of Garret and Gould Pocatello, ID	160050015	21 µg/m <sup>3</sup>	Not detected	21 µg/m <sup>3</sup>



**Table 4-4 Background Ambient Air Quality at Monitoring Stations Closest to the Proposed EREF Site (Cont.)**

Pollutant	Averaging Period	Closest Monitoring Station	Station ID	Measured Ambient Background Concentrations		Selected Background Concentration
				2006	2007	
Particulate PM <sub>2.5</sub>	Annual	G&G Corner of Garret and Gould Pocatello, ID	160050015	6.4 µg/m <sup>3</sup>	Not detected	6.4 µg/m <sup>3</sup>

Sources: IDEQ annual air quality monitoring reports for the calendar years 2006 and 2007 (IDEQ, 2007 and 2008, respectively).

**Table 4-5 Estimated Air Quality Impacts at the Proposed EREF Property Boundary Associated with Initial Preconstruction and Construction<sup>a</sup>**

Pollutant	Emission Rate (g/s)	Averaging Time	Concentration ( $\mu\text{g}/\text{m}^3$ , except ppm for CO)				Percent of Standard	
			Background	Modeled Maximum*	Total	NAAQS/ SAAQS <sup>b</sup>	Modeled Maximum	Total
CO	3.55	1-hour	4.3	0.8	5.1	35	2.4	14.6
		8-hour	2.1	0.1	2.2	9	1.5	24.9
NO <sub>2</sub>	1.3	Annual	11.3	1.0	12.3	100	1.0	12.3
SO <sub>2</sub>	0.1	3-hour	159.7	11.3	171.0	1300	0.9	13.2
		24-hour	62.8	1.8	64.6	365	0.5	17.7
PM <sub>10</sub>	0.1	Annual	15.7	0.1	15.8	80	0.1	19.7
		24-hour	52.0	355.2	407.2	150	236.8	271.5
PM <sub>2.5</sub>	24.3	Annual	22.0	15.9	37.9	50	31.8	75.8
		24-hour	21.0	15.9	36.9	35	45.3	105.3
	2.4	Annual	6.4	1.6	8.0	15	10.5	53.2

<sup>a</sup> AERMOD model uses the following:

- The highest of the second-highest concentrations over 5 years for CO and for 30-hr and 8-hr sulfur dioxide (SO<sub>2</sub>).
- The highest of the annual averages over 5 years for nitrogen dioxide (NO<sub>2</sub>) and SO<sub>2</sub>.
- The high-6th-high concentration over 5 years for 24-hr PM<sub>10</sub>.
- The highest of multiyear average of high-8th-high at each receptor for 24-hr PM<sub>2.5</sub>, the highest of the annual averages over 5 years for NO<sub>2</sub> and SO<sub>2</sub>, and with a wind speed measurement sensitivity of 0.134 m/s and no default value applied for low wind speed.

<sup>b</sup> SAAQS = State Ambient Air Quality Standards.

1 how AERMOD low wind speed bias might impact near-field results for the proposed EREF, the  
2 NRC staff also modeled impacts using the same emission factors, but introduced a “calm wind”  
3 default wind speed of 1.0 meter (3.3 feet) per second, allowing all other modeling parameters to  
4 remain unchanged. As expected, selection of a higher wind speed as the default value for calm  
5 wind resulted in reductions in near-field (i.e., property boundary) modeled concentrations of  
6 particulates. Table 4-6 displays the changes to modeling results that would occur if the “calm  
7 wind speed” default value was set at 1.0 meter (3.3 feet) per second. Under those conditions,  
8 only the 24-hour PM<sub>10</sub> standard would be exceeded (by 161 percent) while all other standards  
9 are met.

10  
11 The NRC staff concludes that preconstruction and construction would have a SMALL impact on  
12 ambient air quality for all criteria pollutants except particulates, but would have a MODERATE  
13 impact on near-field air quality (as modeled at the EREF property boundary) with respect to  
14 particulates when fugitive dust-producing construction activities (site clearing, grading, travel on  
15 unpaved onsite roads, transfer and stockpiling of materials) coincide with low prevailing wind  
16 speeds in the direction of the closest property boundary from the proposed EREF industrial  
17 area. Such wind directions are expected to occur less than 4 percent of the time (see  
18 Figure 3-11).

#### 19 20 **4.2.4.2 Facility Operation**

##### 21 22 **Air Impacts during the Four-Year Overlap Period**

23  
24 The plan of development for the proposed EREF calls for a 4-year period of overlap during  
25 which some limited production (i.e., enrichment of UF<sub>6</sub>) would begin before heavy construction  
26 has been completed (AES, 2010a). AES has indicated that all preconstruction work  
27 (site clearing, grading, stockpiling of materials), construction of all permanent onsite roads and  
28 parking areas (i.e., hard-surface paving for both roads and parking areas), construction of some  
29 production facilities, and construction of all ancillary facilities necessary to support full  
30 production would have been completed before the start of this overlap period (i.e., before any  
31 partial production begins) (AES, 2010a). AES indicates that construction during the overlap  
32 period would be limited to construction of the remaining SBMs, necessitating the disturbance of  
33 a relatively small land area and allowing for dramatic reductions in both the complement of  
34 construction vehicles and equipment and the construction workforce (AES, 2010a). Air quality  
35 impacts associated with continuing construction and limited facility operation would be additive  
36 during the overlap period. Air quality impacts during preconstruction and construction result  
37 primarily from the use of numerous pieces of heavy construction equipment, the disturbance of  
38 a large land area, the presence of a large construction workforce, and frequent material and  
39 equipment deliveries. With all such activities being completed or reduced during the  
40 construction/operation overlap period, the NRC staff concludes that approximately 85 percent of  
41 the air quality impacts related to preconstruction and construction would have occurred before  
42 any facility operations begin, with the remaining construction activities, approximately  
43 15 percent, occurring during the construction/operation overlap period.  
44  
45

**Table 4-6 Sensitivity of AERMOD Dispersion Modeling Results to Low Wind Speed Default Values**

Pollutant	Averaging Time	NAAQS/ SAAQS <sup>a</sup>	Background	Concentration ( $\mu\text{g}/\text{m}^3$ , except ppm for CO)					
				Modeled Maximum at Calm Wind Default Value of 0.134 m/sec	Total	Percent of Standard	Modeled Maximum at Calm Wind Default Value of 1.0 m/s	Total	Percent of Standard
CO	1-hour	35	4.3	0.8	5.1	14.6	0.3	4.6	13.2
	8-hour	9	2.1	0.1	2.2	24.9	0.1	2.2	24.1
NO <sub>2</sub> <sup>b</sup>	Annual	100	11.3	1.0	12.3	12.3	0.8	12.1	12.1
SO <sub>2</sub> <sup>b</sup>	3-hour	1300	159.7	11.3	171.0	13.2	6.3	166.0	12.8
	24-hour	365	62.8	1.0	63.8	18.4	0.3	65.1	17.5
Annual	Annual	80	15.7	0.1	15.8	19.7	0.1	15.8	19.7
	24-hour	150	52.0	355.2	407.2	271.5	189.9	241.9	161.3
PM <sub>10</sub>	Annual	50	22.0	15.9	37.9	75.8	13.1	35.1	70.2
	24-hour	35	21.0	15.9	36.9	105.3	12.0	33.0	94.1
Annual	Annual	15	6.4	1.6	8.0	53.2	1.3	7.7	51.3

<sup>a</sup> SAAQS = State Ambient Air Quality Standards.

<sup>b</sup> NO<sub>2</sub> = nitrogen dioxide; SO<sub>2</sub> = sulfur dioxide.

1 Plans submitted by AES indicate that the majority of preconstruction (cut and fill, onsite road  
2 construction, trenching, and burial of components) would all be completed for the entire site  
3 during the initial construction period, before any facility operation commences, and that  
4 construction of the second, third, and fourth SBMs and other miscellaneous structures and  
5 expansions of cask storage pads would occur during the 4-year overlap period (AES, 2010a).  
6 These remaining construction activities would result in a significant reduction in the number and  
7 types of heavy-duty construction vehicles onsite, as well as a substantial reduction in workforce;  
8 thus, air quality impacts would be substantially less than impacts during the initial  
9 preconstruction and construction phase. Impacts on air quality from partial operation during the  
10 period when operation and construction overlap would be minimal. Consequently, air quality  
11 impacts during the initial preconstruction and construction phase would represent a bounding  
12 condition that would not be exceeded during any subsequent phase of facility development  
13 and/or operation, including the 4-year construction/operation overlap period. Because of the  
14 bounding nature of the air impacts of the initial construction phase, a detailed air quality impact  
15 assessment representative of the overlap period and a more detailed plan of development for  
16 the overlap period are unnecessary.

17

### 18 **Generation and Release of Criteria Pollutants Resulting from EREF Operations**

19

20 Air impacts during operation include criteria pollutant releases from passenger vehicles and  
21 delivery vehicles traveling to and from the site, the periodic preventative maintenance-directed  
22 operation of emergency diesel generators (see below), and the operation of miscellaneous  
23 comfort heating systems burning fossil fuels. In its Environmental Report, AES (2010a)  
24 estimated the number of passenger vehicles involved in the workforce's daily commute to be  
25 550 vehicles, which is equivalent to the number of individuals in the workforce (i.e., no credit  
26 taken for buses or carpools), and assumed each vehicle completes an average commute of  
27 80.5 kilometers (50 miles) (daily, roundtrip).<sup>3</sup> AES also estimated the number and type of  
28 delivery vehicles traveling to or from the site daily to deliver materials, equipment, and feedstock  
29 and remove products and waste materials to be 36 heavy-duty trucks and estimated the  
30 average travel distance of each to be 805 kilometers (500 miles). AES has also estimated that  
31 there would be 250 workdays per year. Air impacts from the above activities were determined  
32 using the EPA-approved MOBILE 6.2 model. The NRC staff has reviewed the assumptions  
33 used by AES to define the input parameters for MOBILE 6.2 and has determined that all are  
34 reasonable and appropriate. The NRC staff confirmed the resulting air impacts through an  
35 independent analysis. The results are displayed in Table 4-7.

36

37 Not reflected in Table 4-7 are the incidental amounts of criteria pollutants that would result from  
38 the operation of comfort heating systems using fossil fuels such as natural gas and/or propane.  
39 However, because of the difficulty in predicting how much fuel would be consumed and because  
40 these contributions are expected to be negligible, they are not represented in Table 4-7. Also  
41 not reflected in Table 4-7 are impacts from the onsite storage and dispensing of vehicle fuels  
42 during EREF operation. Fuel consumption during operation is estimated at 568 liters  
43 (150 gallons) of gasoline per week and 568 liters (150 gallons) of diesel fuel per week.

44

---

<sup>3</sup> This assumption is consistent with the expectation that the majority of the EREF workforce would reside in Idaho Falls, approximately 25 miles east of the site.



**Table 4-7 NRC's Estimated Emissions of Criteria Pollutants Resulting from Operations at the Proposed EREF**

Vehicle Type	Emission Factor (g/mi)	Estimated Daily Number of Vehicles	Estimated Daily Mileage km (mi)	Daily Workday Emissions grams (tons)
<b>Nonmethane hydrocarbons</b>				
Light-duty vehicles (gasoline)	1.219	550	80 (50)	33,523 ( $3.7 \times 10^{-2}$ )
Heavy-duty vehicles (diesel)	0.506	36	805 (500)	9108 ( $1.0 \times 10^{-2}$ )
Emergency generators	NA <sup>a</sup>	6	NA	646 <sup>b</sup> ( $7.1 \times 10^{-4}$ )
Total				43,277 ( $4.78 \times 10^{-2}$ )
<b>Carbon monoxide</b>				
Light-duty vehicles (gasoline)	20.350	550	80 (50)	559,625 ( $6.17 \times 10^{-1}$ )
Heavy-duty trucks (diesel)	2.560	36	805 (500)	46,080 ( $5.08 \times 10^{-2}$ )
Emergency generators				2792 <sup>c</sup> ( $3.1 \times 10^{-3}$ )
Total				608,497 ( $6.81 \times 10^{-1}$ )
<b>Nitrogen oxides</b>				
Light-duty trucks (gasoline)	1.193	550	80 (50)	32,808 ( $3.6 \times 10^{-2}$ )
Heavy-duty trucks (diesel)	10.292	36	805 (500)	185,256 (0.204)
Emergency generators	NA	NA		32,450 <sup>d</sup> ( $3.6 \times 10^{-2}$ )
Total				250,514 (0.277)

<sup>a</sup> NA = not applicable.

<sup>b</sup> Based on the AES estimate of 168 kg/yr (0.185 tons/yr) from preventative maintenance operations.

<sup>c</sup> Based on the AES estimate of 726 kg/yr (0.80 tons/yr) from preventative maintenance operations.

<sup>d</sup> Based on the AES estimate of 8437 kg/yr (9.3 tons/yr) from preventative maintenance operations.

1  
2 EPA-approved algorithms predict releases of 298 kilograms (657 pounds) per year of VOCs  
3 during operation. Given the VOC control features of the tanks, their modest size, the limited  
4 volumetric throughputs, the estimated annual releases, and commitments by AES to identify  
5 and employ BMPs for the storage and dispensing of fuels (AES, 2010a), impacts on air quality  
6 from the storage and dispensing of fuels during operation would be SMALL.

7  
8 **Generation and Release of Non-Criteria Chemical Pollutants Related to EREF Operations**

9  
10 In addition to the criteria pollutants released as a result of preventative maintenance testing of  
11 emergency generators, AES has identified the potential for release of certain specific chemicals  
12 as a result of routine operations of the proposed EREF (AES, 2010a). Based on the operating  
13 experiences at a European enrichment facility using the same centrifuge technology as EREF,  
14 and scaled to the number of separative work units (SWUs) represented in the currently  
15 proposed EREF design, AES estimates the following releases: 2.0 kilograms (4.4 pounds) per

1 year of hydrogen fluoride (HF),<sup>4</sup> 173 kilograms (382 pounds) per year of ethanol, and  
2 1684 kilograms (3713 pounds) per year of methylene chloride. In addition to the above noted  
3 releases associated with operation of the centrifuges, the ER (AES, 2010a) also notes the  
4 potential for release of uranic materials to the atmosphere from the operation of the Liquid  
5 Effluent System Evaporator. The uranic materials in the liquid effluents discharged to the  
6 evaporator that are not removed and captured by precipitation or filtration would be evaporated  
7 to the atmosphere. AES estimates that the discharge of total uranium to the atmosphere from  
8 the evaporator would be <0.0356 grams per year (AES, 2010a). Idaho air regulations (Title 58  
9 of the Idaho Administrative Code [IAC, 2010]) establish specific controls for fluoride, ethanol,  
10 methylene chloride, and total uranium (natural isotopic distribution, both soluble and insoluble  
11 salts).<sup>5</sup> The regulations establish occupational exposure levels (OEL), maximum allowable  
12 emission limits (EL), and acceptable ambient concentrations (AACs) for each, as shown in  
13 Table 4-8.

14  
15 In addition to the applicable standards displayed in Table 4-8, the following allowable levels of  
16 fluoride in animal feed crops and forage crops are established in Title 58 Part 557.06: 40 ppm  
17 (dry basis, monthly), 60 ppm (dry basis, two consecutive months), and 80 ppm (dry basis, never  
18 to be exceeded) (IAC, 2010). Emissions of UF<sub>6</sub> from the GEVSs of the SBMs will result in the  
19 formation of HF in the atmosphere. These crop fluoride accumulation standards are relevant to  
20 the proposed EREF because of the potential for animal feed or forage crops to be grown on  
21 adjacent land parcels.

22  
23 The NRC staff evaluated whether the estimated maximum annual amount of fluoride emissions  
24 would exceed Idaho limits for the maximum rate of fluoride release, AAC for fluoride, and/or the  
25 maximum amount of fluoride accumulation on forage crops (AES, 2010a). To ensure a  
26 conservative evaluation of the maximum concentration of fluoride in air, the NRC staff assumed  
27 that release of the entire projected annual amount of HF (2 kilograms [4.4 pounds]) occurred  
28 instead within a one-month period (i.e., over a period of 720 hours instead of over 8760 hours in  
29 a year). Those conditions would result in a release rate of approximately 2.7 grams per hour  
30 ( $6.0 \times 10^{-3}$  pound per hour). Thus, the maximum release rate, even over a compressed time  
31 frame, is substantially less than the allowable rate of 75.8 grams (0.167 pound) per hour in  
32 Idaho rules. Based on the European experience, AES estimated an HF concentration at the  
33 point of release of 7.7 micrograms per cubic meter. The NRC staff has independently verified

---

<sup>4</sup> Trace amounts of UF<sub>6</sub> are potentially released from the gaseous emission ventilation systems (GEVSs). Each mole of UF<sub>6</sub> released will hydrolyze when exposed to humidity in ambient air to form 4 moles of HF and one mole of uranyl fluoride (UO<sub>2</sub>F<sub>2</sub>).

<sup>5</sup> Releases from GEVSs would be in the form of UF<sub>6</sub>. Although the feedstock arriving at EREF would contain a natural distribution of uranium isotopes, as the UF<sub>6</sub> progresses through the centrifuge chain, enrichment of the <sup>235</sup>U isotope occurs and the UF<sub>6</sub> no longer exhibits the natural isotopic ratio. UF<sub>6</sub> could be released from any of the centrifuges in the series, and releases from a particular centrifuge could change over time. All such releases are collected in a common header before being sent to a GEVS; thus, it is difficult to ascertain the precise isotopic ratio of the collective UF<sub>6</sub> releases arriving at each GEVS. However, for the purpose of this impact assessment, the Idaho standard for uranium releases is still presumed to apply to all GEVS releases, even though most such releases are unlikely to exhibit the natural isotopic distribution.

**Table 4-8 Idaho Chemically Specific Air Quality Standards<sup>a</sup>**

CAS Number	Pollutant	OEL (mg/m <sup>3</sup> )	EL (lb/hr)	AAC
NA	Fluoride <sup>b</sup>	2.5	0.167	0.125 mg/m <sup>3</sup>
64-17-5	Ethanol <sup>b</sup>	1880	125	94 mg/m <sup>3</sup>
75-9-2	Methylene chloride <sup>c</sup>	4.1 × 10 <sup>-6</sup>	1.6 × 10 <sup>-3</sup>	0.24 µg/m <sup>3</sup>
7440-61-1	Uranium <sup>b</sup>	0.2	0.013	0.01 mg/m <sup>3</sup>

<sup>a</sup> CAS = Chemical Abstract Service Number (unique identifier).

NA = not applicable.

OEL = occupational exposure level.

EL = exposure level.

AAC = acceptable ambient concentration (mg/m<sup>3</sup> for noncarcinogens, µg/m<sup>3</sup> for carcinogens).

<sup>b</sup> *Idaho Administrative Procedures Act* (IDAPA) 58.01.01 Part 585, "Toxic Air Pollutants Noncarcinogenic Increments." Uranium as natural isotopic distribution, all soluble and insoluble salts.

<sup>c</sup> IDAPA 58.01.01 Part 586, "Toxic Air Pollutants Carcinogenic Increments."

1  
2 this concentration at the point of release (SBM rooftop),<sup>6</sup> and finds it to be substantially less than  
3 the allowable 0.125 milligrams per cubic meter in Idaho rules. Dispersion even in the most  
4 stable atmospheric stability class would reduce this concentration even further at the proposed  
5 EREF property boundary, the closest possible distance for public access; thus, the public's HF  
6 exposure potential would be well below allowable levels.

7  
8 The amount of HF released annually, 2 kilograms (4.4 pounds), represents 100 moles of HF  
9 (1900 grams of fluoride). Coincident with the formation of 100 moles of HF will be the formation  
10 of 25 moles of uranyl fluoride (UO<sub>2</sub>F<sub>2</sub>) (7700 grams [16.9 pounds]) (equivalent to 50 moles of  
11 fluoride, or 950 grams [2 pounds]). This represents a rate of release of 2850 grams  
12 (6.3 pounds) of fluoride over the course of 1 year (0.33 gram per hour or 7.2 × 10<sup>-4</sup> pound per  
13 hour (lb/hr) over the course of a year, assuming a steady rate of release over the entire year).  
14 This amount would be substantially less than the Idaho allowable amount of 5.9 grams  
15 (0.013 pound) per hour.

16  
17 Operation of the evaporator would result in the atmospheric release of less than 0.0356 gram  
18 per year of additional uranic materials. Assuming a continuous operation of the evaporator over  
19 the course of the year (8760 hours/yr), the release would equate to 3.99 × 10<sup>-4</sup> gram per hour  
20 (8.79 × 10<sup>-7</sup> pound per hour). This projected release rate is also substantially below the  
21 allowable 1.3 × 10<sup>-2</sup> pound per hour exposure level. Collectively, all releases of uranic materials  
22 resulting from routine operation are also substantially below the allowable exposure level.

23  
24 The most conservative site-specific air dispersion factor calculated at the proposed EREF  
25 property boundary is 4.3 × 10<sup>-6</sup> second per cubic meter. Applying that to the calculated  
26 maximum rate of release for HF results in a concentration of HF in air of 2.7 × 10<sup>-7</sup> milligram per  
27 cubic meter (1.7. × 10<sup>-14</sup> pounds per cubic foot). This value is substantially less than the AAC of

<sup>6</sup> Flow rates from the GEVS are withheld from public disclosure in accordance with 10 CFR 2.390.

1 fluoride in ambient air of 0.125 milligram per cubic meter ( $8. \times 10^{-9}$  pound per cubic foot) (annual  
2 average) specified in *Idaho Administrative Procedures Act* (IDAPA) 58.01.01 Part 585.<sup>7</sup>  
3

4 The highest estimated deposition factor, occurring in the northeast sector of the proposed EREF  
5 site, was calculated to be  $2.43 \times 10^{-7}$  per square meter. Applying this deposition factor to the  
6 annual fluoride emissions of 2.0 kilograms (4.4 pounds) results in an estimated maximum HF  
7 deposition rate of  $4.9 \times 10^{-7}$  kilogram per square meter ( $2.6 \times 10^{-6}$  pound per square meter).  
8 Over the course of the year, this rate of deposition would be distributed over surrounding  
9 sectors in accordance with the expected wind rose (e.g., a circular diagram showing, for a  
10 specific location, the percentage of time the wind blows from each compass direction over a  
11 specified period), and the IDAPA regulatory limits would not be exceeded.  
12

13 An annual emission of 173 kilograms (382 pounds) of ethanol represents an emission rate of  
14  $2.0 \times 10^{-2}$  kilogram per hour ( $4.4 \times 10^{-2}$  pound per hour). This emission rate is less than the  
15 allowable rate of 56.7 kilograms (125 pounds) per hour contained in Idaho regulations  
16 (IAC, 2010). Applying a conservative assumption that the entire annual emissions of ethanol  
17 would occur over a 1-month period (720 hours), an emission rate of 0.24 kilogram per hour  
18 (0.53 pound per hour) would result, which is less than the allowable amount.  
19

20 AES indicated that methylene chloride is used exclusively in small bench-top quantities to clean  
21 certain pieces of equipment on an average of 20 hours each week (based on a 5-day work  
22 week) (AES, 2010a). Of the total 5295 liters (849 gallons) of methylene chloride used each  
23 year, 4415 liters (638 gallons) would be recovered from the cleaning operation and managed as  
24 liquid hazardous waste, while an estimated 1055 kilograms (2325 pounds) would be released  
25 from the cleaning operation as vapor (AES, 2010a). Idaho rules establish a maximum allowable  
26 emission rate for methylene chloride of  $7.2 \times 10^{-5}$  gram per hour ( $1.6 \times 10^{-3}$  pound per hour) and  
27 a maximum AAC concentration standard of  $2.4 \times 10^{-1}$  microgram per cubic meter  
28 ( $1.4 \times 10^{-13}$  pound per cubic feet). Applying the most conservative site-specific air dispersion  
29 factor at the proposed EREF boundary of  $4.3 \times 10^{-6}$  second per cubic meter to the methylene  
30 chloride usage parameters proposed by AES, the emissions of methylene chloride would be in  
31 compliance with all applicable Idaho standards even without the application of any emission  
32 controls. The use of charcoal filters in the ventilation system serving the cleaning operation  
33 would further reduce the amount of methylene chloride actually released to the atmosphere to  
34 well below applicable standards.  
35

36 NRC's analysis supports the conclusion that all emission standards in Idaho regulations for  
37 noncriteria pollutants released from point sources would be satisfied during normal operation,  
38 and all Idaho standards for AAC are met at the proposed EREF property boundary. The NRC  
39 further concludes that National Ambient Air Quality Standards would also be met at the  
40 proposed EREF property boundary during normal operations. The NRC staff therefore  
41 concludes that air quality impacts during operation of the EREF would be SMALL.  
42

---

<sup>7</sup> The Idaho standard is based on releases of the fluoride ion and not releases of HF. Correcting for the differences in weight of HF and the fluoride ion involves multiplying the amount of HF released by a correction fraction of 18/19, or 0.95, to provide the amount of fluoride ion contained in that HF release. Given the five orders of magnitude difference between HF released and the fluoride standard, even with application of this correction factor, the HF releases are well below the fluoride standard.

### 4.2.4.3 Mitigation Measures

Impacts from the release of criteria pollutants, aside from PM associated with fugitive dust, from the operation of vehicles and equipment during preconstruction, construction, and operation are not expected to result in exceedance of ambient air quality standards or violation of applicable stationary source standards extant in Idaho.

Various mitigative measures are available to reduce, or in some cases eliminate, certain air quality impacts related to preconstruction, construction, and operation. AES has identified the following mitigative options for preconstruction and construction (AES, 2010a):

- BMPs would be applied during preconstruction and construction to reduce fugitive dust generation to the greatest practical level; such measures would include:
  - twice per day watering of unpaved onsite roads, excavation areas, and clearing and grading areas
  - use of alternative dust palliatives (inorganic salts, asphaltic products, synthetic organics)
  - established and enforced speed limits for onsite roads
  - suspension of certain dust-producing activities during windy conditions
  - application of gravel to the unpaved surfaces of onsite haul roads as an interim measure before permanent pavements are installed
  - apply erosion mitigation methods in areas of disturbed soils
  - use of water sprays at material-drop and conveyor-transfer points
  - limit the height and disturbance of material stockpiles
  - apply water to the surfaces of stockpiles
  - cover open-bodied trucks that transport materials that could be sources of airborne dust
  - promptly remove earthen materials deposited on paved roadways by wind, trucks, or earthmoving equipment
  - promptly stabilize or cover bare areas resulting from roadway or highway interchange construction

To mitigate potential impacts from onsite vehicle fuel storage and dispensing during preconstruction, construction, and operation, AES has identified the following mitigation measures (AES, 2010a):

- BMPs would be applied to the design and operation of onsite vehicle and equipment fueling activities to minimize the release to the atmosphere of nonmethane hydrocarbons and mitigate the potential impact of spills or accidental releases; these measures would include:
  - storage tanks would be equipped with appropriate VOC controls, liquid level gauges, and overfill protection
  - fuel delivery drivers would receive adequate training prior to being allowed onsite
  - appropriate warning signs would be posted at the fuel dispensing facility
  - fuel unloading and dispensing areas would be paved and equipped with curbs to control small spills
  - delivery contractors would carry spill kits and would be required to address minor spills during fuel deliveries

Mitigation measures identified by AES to control the release of volatile organic compounds and criteria pollutants during preconstruction and construction include:



- 1 • maintaining all internal combustion engines and their pollution control devices in good  
2 working order

3  
4 Mitigation measures identified by AES for operation include the following:

- 5  
6 • install the SBM Safe-by-Design Gaseous Effluent Vent System (GEVS) and SBM Local  
7 Extraction GEVS, which are designed to collect and clean all potentially hazardous gases  
8 from the plant prior to release to the atmosphere; provide instrumentation to detect and  
9 signal, via alarm, all nonroutine process conditions, including the presence of radionuclides  
10 or HF in the exhaust stream that will trip the system to a safe condition in the event of  
11 effluent detection beyond routine operational limits
- 12  
13 • install the Technical Services Building (TSB) GEVS, which is designed to collect and clean  
14 all potentially hazardous gases in the serviced areas from the TSB prior to release to the  
15 atmosphere; provide instrumentation to detect and signal the Control Room, via alarm,  
16 regarding all nonroutine process conditions, including the presence of radionuclides or HF in  
17 the exhaust stream; operators would then take appropriate actions to mitigate the release
- 18  
19 • install the Centrifuge Test and Postmortem Facilities GEVSs, which are designed to collect  
20 and clean all potentially hazardous gases in the serviced areas from the Centrifuge  
21 Assembly Building prior to release to the atmosphere; provide instrumentation to detect and  
22 signal the Control Room, via alarm, regarding all nonroutine process conditions, including  
23 the presence of radionuclides or HF in the exhaust stream; operators would then take  
24 appropriate actions to mitigate the release
- 25  
26 • design the TSB Contaminated Area heating, ventilating, and air conditioning (HVAC)  
27 system, the Ventilated Room HVAC system in the Blending, Sampling, and Preparation  
28 Building (BSPB), and the Centrifuge Test and Postmortem Facilities exhaust filtration  
29 system to collect and clean all potentially hazardous gases in the serviced areas prior to  
30 release to the atmosphere
- 31  
32 • apply gravel to the unpaved surface of the secondary access road
- 33  
34 • impose speed limits on the unpaved secondary access road
- 35  
36 • maintain air concentrations of criteria pollutants resulting from vehicle emissions and fugitive  
37 dust below NAAQS

38  
39 The NRC staff concludes that the above mitigation measures and BMPs would be sufficient to  
40 ensure that air quality impacts would remain at acceptable levels over the majority of time  
41 throughout the preconstruction and initial construction phases. Additionally, the NRC staff  
42 concludes proper application of these mitigation measures, including temporary suspension of  
43 certain dust-producing activities, would ensure that periods of potentially unacceptable levels of  
44 air impacts would be avoided. The NRC further concludes that the BMPs committed to by AES  
45 for application during the operation of the proposed EREF would be sufficient to ensure air  
46 impacts remain at acceptable levels. The following mitigation measures identified by NRC would  
47 further reduce air quality impacts:

- 1 • ensure vehicles and equipment with internal combustion engines are properly tuned and  
2 pollution control devices are functional  
3
- 4 • provide first responder training to selected workers; ensure storage tanks are equipped with  
5 fully functional overflow and vapor control features  
6
- 7 • install hard-surface pavements, curbs, scupper drains, and drainage ways at fuel dispensing  
8 islands that will channel spilled fuels to fire-safe containment sumps; require delivery drivers  
9 to remain in attendance throughout all fuel deliveries; require drivers to verify the proper  
10 working condition of storage tank overfill features before commencing fuel deliveries; require  
11 drivers to promptly address all spills occurring during fuel deliveries (including removal of all  
12 fuels in overfill devices after completion of fuel transfers)  
13
- 14 • install emergency shut-offs for fuel dispensing pumps; post spill response directives at the  
15 fuel dispensing islands; provide spill containment and cleanup materials at the fuel  
16 dispensing islands for cleanup of small spills; ensure the fuel dispensing islands have  
17 adequate lighting  
18
- 19 • adopt a policy that requires prompt cleanup of all spilled materials  
20
- 21 • identify and select construction-related products and chemicals that are free of volatile  
22 solvents  
23
- 24 • suspend high fugitive dust-generating activities during early morning hours with calm winds  
25 and during windy periods  
26

#### 27 **4.2.5 Geology and Soil Impacts**

28  
29 This section describes the potential environmental impacts on geologic resources and soils  
30 during preconstruction/construction and operation of the proposed EREF. Impacts could result  
31 primarily during the preconstruction and construction phases from planned surface grading and  
32 excavation activities that loosen soil and increase the potential for erosion by wind and water.  
33 Soil compaction as a result of heavy vehicle traffic could also increase the potential for soil  
34 erosion by increasing surface runoff. Spills and inadvertent releases during all project phases  
35 could contaminate site soils. Implementation of mitigation measures would ensure that these  
36 impacts would be SMALL. Because there are no known petroleum resources or nonpetroleum  
37 mineral deposits on the proposed EREF site (see Section 3.6.1.2), impacts on geologic  
38 resources are not expected.  
39

##### 40 **4.2.5.1 Preconstruction and Construction**

41  
42 Preconstruction and construction activities for the proposed EREF site have the potential to  
43 impact site soils in the construction area. During preconstruction, conventional earth- and rock-  
44 moving and earth-grading equipment would be used. Blasting and mass rock excavation may  
45 also be required. Activities would include surface grading and excavation of the soils for roads,  
46 utility lines, stormwater basins, and installation of certain building foundations.  
47

1 Preconstruction and construction activities would disturb a total of about 240 hectares  
2 (592 acres) within the proposed 1700-hectare (4200-acre) property, or about 14 percent of the  
3 total property area (AES, 2010a). This total includes the proposed EREF footprint of about  
4 186 hectares (460 acres) and an additional 53.6 hectares (132.5 acres) for temporary  
5 construction facilities, parking areas, material storage areas, and excavated areas for  
6 underground utilities (AES, 2010a). The proposed EREF footprint would include buildings and  
7 other permanent structures such as parking areas, retention/detention ponds, cylinder storage  
8 pads, and roads. Facility structures would have foundations and footings with depths ranging  
9 from 0.76 meter (2.5 feet) to 6.0 meters (20 feet) (AES, 2009b); utility trenches would range in  
10 depth from 0.9 meter (3 feet) to 3.7 meters (12 feet) (AES, 2009b). The remaining land, about  
11 1460 hectares (3608 acres), would be left in a natural state with no designated use for the life of  
12 the proposed facility (AES, 2010a). About 3 hectares (7.5 acres) would be landscaped, of which  
13 about 2 hectares (5 acres) would be irrigated (AES, 2009b). Areas within the proposed property  
14 boundaries currently used for irrigated crops and grazing would be taken out of service during  
15 the construction and operation of the proposed EREF (AES, 2010a).

16  
17 The proposed EREF would be located on relatively flat terrain; however, some cut and fill would  
18 be required to bring the ground level to final grade (AES, 2010a). Onsite soils are suitable for fill  
19 and consist of a combination of soil and basaltic bedrock. Excavated soils would be used for fill  
20 at lower areas of the proposed site; no offsite disposal of soils would be required (AES, 2009b).  
21 Current plans are for a total of 778,700 cubic meters (1,018,500 cubic yards) of soil to be cut  
22 and used as fill (AES, 2010a). The deepest cut would be about 6 meters (20 feet), and the  
23 deepest fill also would be about 6 meters (20 feet) (AES, 2010a). Onsite soils would be used in  
24 site grading to the extent possible. Additional soil from offsite sources would be used to  
25 augment fill requirements of roads and structures, as needed (AES, 2009b). Approximately  
26 66,000 cubic meters (86,325 cubic yards) of clay would be brought onto the proposed EREF  
27 site from a nearby source for use as liner material for the two Cylinder Storage Pads  
28 Stormwater Retention Basins (AES, 2009b).

### 29 30 **Geologic Hazards**

31  
32 Preliminary site geotechnical investigations indicate that the entire area of the proposed EREF  
33 footprint is underlain by competent bedrock of basaltic lava (AES, 2010a). Subsidence due to  
34 construction is not expected; however, there is some potential for collapse due to increased  
35 loads during construction where lava tubes occur in the subsurface. Lava tubes have been  
36 observed at other locations on the Eastern Snake River Plain (ESRP) (such as that reported by  
37 Kesner, 1992). The presence of lava tubes will be considered during subsurface investigations  
38 associated with facility construction. The potential for landslides on the proposed EREF site is  
39 considered low because slopes across the proposed site are low, soils are thin or absent, and  
40 precipitation rates are low.

41  
42 The proposed EREF site is in an area of very low seismic activity (see Section 3.6.1.1). Seismic  
43 history and geologic conditions indicate that earthquakes with a magnitude of more than 5.5 are  
44 not likely to occur within the ESRP; however, moderate to strong ground shaking from  
45 earthquakes with loci in other areas within the Basin and Range province could be felt at the  
46 proposed EREF site. The liquefaction potential of soils at the proposed EREF site is considered  
47 to be low since soils are dry or only partially saturated and groundwater at the proposed site is  
48 very deep.

1 The likelihood of a volcanic event (basaltic or silicic eruption) is very low at the proposed EREF  
2 site (see Section 3.6.1.1).

### 3 4 **Impacts Summary**

5  
6 Preconstruction and construction activities could cause an increase in soil erosion at the  
7 proposed EREF site by loosening soils and making them more susceptible to erosion by wind  
8 action and rain, although rainfall in the vicinity of the proposed site is low. Compaction of soils  
9 due to heavy vehicle traffic could also contribute to soil erosion in some areas if infiltration rates  
10 are reduced to the point of causing increased surface runoff. Because these impacts are short-  
11 term and can be mitigated (see Section 4.2.5.3), they would be SMALL.

12  
13 Chemical spills or releases around vehicle maintenance and fueling locations, storage tanks,  
14 and painting operations could introduce contaminants to soils during the preconstruction and  
15 construction phase. Contaminated soils could leave the proposed site via wind or water erosion  
16 (as fugitive dust or surface runoff). Leaching of contaminated soils could affect shallow  
17 groundwater. These processes are naturally mitigated by site characteristics such as thin or  
18 absent soil coverage, a low rate of precipitation, and the absence of onsite perennial drainages  
19 (see Sections 3.6.3 and 3.7.1). They also could be controlled by following best management  
20 practices and procedures (e.g., diverting stormwater to a detention basin). For all these  
21 reasons, impacts due to chemical spills or releases at the proposed EREF site would be  
22 SMALL.

23  
24 The majority of soil-disturbing activities (i.e., blasting, excavating, and grading) and heavy  
25 equipment traffic would occur during the preconstruction period; it is estimated, therefore, that  
26 about 95 percent of the impacts described in this section would be attributed to the  
27 preconstruction phase of development (AES, 2010a).

### 28 29 **4.2.5.2 Facility Operation**

30  
31 Soil conditions would stabilize during the operations period as ground-disturbing activities  
32 associated with construction wind down and mitigation measures such as revegetation are  
33 implemented. Impacts on soils during operation of the proposed EREF would be SMALL  
34 because operations would not involve activities that increase the potential for soil erosion and  
35 the rate of soil erosion due to wind and rain would be similar for the proposed site as that for the  
36 surrounding area.

37  
38 Releases to the atmosphere during normal operation of the proposed EREF, as discussed in  
39 Section 4.2.4.2, could contribute to a small increase in the amount of HF, ethanol, methylene  
40 chloride, and UF<sub>6</sub> in surrounding soils as they are transported downwind. All estimated  
41 atmospheric releases of pollutants would be below the amounts allowed by permits, and the  
42 impacts on soil quality due to aerial deposition during operations would be SMALL. Therefore,  
43 operations at the proposed EREF would result in SMALL impacts on site and surrounding area  
44 soil resources.

1 **4.2.5.3 Mitigation Measures**

2  
3 Mitigation measures identified by AES (2010a) to avoid or minimize impacts due to soil erosion  
4 include:

- 5
- 6 • using BMPs to reduce soil erosion (e.g., earth berms, dikes, and sediment fences)
  - 7
  - 8 • revegetating or covering bare areas with natural materials promptly
  - 9
  - 10 • watering soils to control fugitive dust
  - 11
  - 12 • using standard drilling and blasting methods to reduce the potential for over-excavation,  
13 minimize damage to surrounding rock, and protect adjacent surfaces intended to remain  
14 intact
  - 15
  - 16 • placing stockpiles in an appropriate manner
  - 17
  - 18 • reusing excavated materials whenever possible
  - 19

20 The NRC identified the following additional mitigation measures:

- 21
- 22 • minimizing the areas affected by construction to the extent possible
  - 23
  - 24 • covering stockpiles to reduce exposure to wind and rain
  - 25
  - 26 • limiting routine vehicle traffic to paved or gravel roads
  - 27

28 AES would be required to comply with the provisions in the National Pollutant Discharge  
29 Elimination System (NPDES) Construction General Permit and Industrial Stormwater Permit,  
30 issued by EPA Region 10 with an oversight review by the IDEQ (AES, 2010a). The NPDES  
31 Construction General Permit requires AES also to develop a Stormwater Pollution Prevention  
32 (SWPP) Plan to identify control measures to minimize disturbed areas and protect natural site  
33 features and erodible soil (EPA 2010a). A stormwater detention basin would be used during  
34 preconstruction, construction, and operation (AES, 2009b). Following the requirements of a  
35 Spill Prevention Control and Countermeasures (SPCC) Plan would reduce the potential impacts  
36 from chemical spills or releases around vehicle maintenance and fueling locations, storage  
37 tanks, and painting operations during construction and operation, and ensure prompt and  
38 appropriate cleanup. Appropriate waste management procedures would be followed to  
39 minimize the impacts on soils from solid waste and hazardous materials that would be  
40 generated during all phases. Where practicable, a recycling program for materials suitable for  
41 recycling would be implemented.

42  
43 **4.2.6 Water Resources Impacts**

44  
45 This section discusses the potential environmental impacts on surface water and groundwater  
46 during preconstruction/construction and operation of the proposed EREF. The discussion  
47 includes the potential impact to natural drainage on and around the proposed EREF property  
48 and the effect of the proposed EREF on the regional water supply.



1 During preconstruction, construction, and operation, the water supply for the proposed EREF  
2 would be obtained from onsite wells completed in the ESRP aquifer. The primary point of  
3 diversion would be the existing onsite agricultural well (Lava Well; as discussed in  
4 Section 3.7.2.3) and an additional well installed to supply potable water. No surface water  
5 sources would be used. Because the annual maximum usage rates during preconstruction,  
6 construction, and normal operations would be well below the annual water right appropriation  
7 (Carlsen, 2009), impacts on the groundwater supply would be SMALL.  
8

9 All preconstruction and construction activities would comply with the requirements of the  
10 NPDES Construction General Permit<sup>8</sup> (AES, 2010a). Stormwater runoff would be diverted to a  
11 stormwater detention basin (AES, 2009b). During operations, stormwater would be released to  
12 onsite detention and retention basins from the central footprint area of the proposed EREF  
13 (AES, 2010a); stormwater runoff to adjacent properties therefore would not be increased. There  
14 would be no direct discharges of wastewater to surface water or groundwater (AES, 2010a).  
15 AES would develop an SWPP Plan to identify control measures to minimize disturbed areas and  
16 protect natural site features and erodible soil. Process effluents in the Liquid Effluent Treatment  
17 System Evaporator would only be discharged by evaporation to the atmosphere (AES, 2010a).  
18 Compliance with the requirements of an SPCC Plan would minimize impacts to water quality  
19 due to potential chemical spills or releases. For these reasons, impacts on water resources  
20 would be SMALL.  
21

#### 22 **4.2.6.1 Preconstruction and Construction**

##### 23 **Water Use**

24  
25  
26 The water supply during the 12-year preconstruction and construction period would be obtained  
27 from one or more onsite wells completed in the ESRP aquifer. No surface water sources would  
28 be used. During this period, the proposed EREF would consume water to meet potable and  
29 sanitary needs, as well as for concrete mixing, dust control, compaction of fill, and watering of  
30 vegetation. None of this water would be returned to its original source.  
31

32 Average daily water usage during the preconstruction and construction period would be about  
33 207 cubic meters (54,700 gallons), with a peak daily usage of 382 cubic meters  
34 (101,000 gallons) in the second year (Table 4-9). Water requirements for construction are  
35 expected to taper off significantly after the seventh year. Average daily water usage during the  
36 last five years of construction would be about 28 cubic meters (7326 gallons). These usage  
37 rates are within the water right appropriation that has been transferred with the proposed  
38 property for use as industrial water. The annual appropriation for industrial use is  
39 506.8 acre-feet, which is 625,000 cubic meters (165 million gallons), or about 1700 cubic meters  
40 (453,000 gallons) per day (Carlsen, 2009).  
41  
42

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<sup>8</sup> Updates on the NPDES permitting process can be viewed on the EPA's website at  
[http://cfpub.epa.gov/npdes/stormwater/noi/noidetail\\_new.cfm?ApplId=IDR10CI01](http://cfpub.epa.gov/npdes/stormwater/noi/noidetail_new.cfm?ApplId=IDR10CI01).

**Table 4-9 Water Use for the Preconstruction and Construction Period**

Year	Construction <sup>a</sup>				Total Construction cubic meters (gallons)
	Potable Water cubic meters (gallons)	Concrete <sup>b</sup> cubic meters (gallons)	Dust <sup>c</sup> cubic meters (gallons)	Soil Compaction <sup>d</sup> cubic meters (gallons)	
1	19,555 (5,166,000)	1216 (321,331)	52,466 (13,860,000)	16,982 (4,486,100)	90,219 (23,833,431)
2	28,141 (7,434,000)	3649 (963,993)	52,466 (13,860,000)	12,130 (3,204,350)	96,385 (25,462,343)
3	19,078 (5,040,000)	10,948 (2,891,978)	52,466 (13,860,000)	9704 (2,563,500)	92,196 (24,355,478)
4	13,832 (3,654,000)	72,989 (1,927,985)	52,466 (13,860,000)	4852 (1,281,750)	78,448 (20,723,735)
5	13,832 (3,654,000)	6082 (1,606,655)	52,466 (13,860,000)	4582 (1,281,750)	77,232 (20,402,405)
6	8347 (2,205,000)	4561 (1,204,991)	52,466 (13,860,000)	0 (0)	65,374 (17,269,991)
7	6677 (1,764,000)	2433 (642,662)	52,466 (13,860,000)	0 (0)	61,576 (16,266,662)
8	6677 (1,764,000)	1216 (321,331)	26,233 (6,930,000)	0 (0)	34,127 (9,015,331)
9	6677 (1,764,000)	304 (80,333)	6558 (1,732,500)	0 (0)	13,540 (3,576,833)
10	5962 (1,575,000)	76 (20,083)	1640 (433,125)	0 (0)	7678 (2,028,208)
11	5008 (1,323,000)	19 (5021)	410 (108,281)	0 (0)	5437 (1,436,302)
12	3816 (1,008,000)	5 (1255)	102 (27,070)	0 (0)	3923 (1,036,326)

<sup>a</sup> Assumes 252 workdays per year for construction-related activities (5 days per week).

<sup>b</sup> Assumes a usage rate of 151.4 liters (40 gal) used per cubic yard of concrete mixing and curing.

<sup>c</sup> Assumes a usage rate of 208,198 liters (55,000 gal) per day.

<sup>d</sup> Earthwork and soil compaction are assumed to be completed by the end of the 5th year.

Source: AES, 2010a.

2  
3  
4  
5  
6  
7  
8

The average daily (industrial) water usage during the preconstruction and construction period would be less than 1 percent of the total daily groundwater withdrawals of 640,000 cubic meters (169 million gallons) from the ESRP aquifer in Bonneville County, as measured by the USGS in 2005 (USGS, 2010). The preconstruction phase is estimated to occur during an 8-month period.

1 Water usage for landscaping and restoration of disturbed areas would begin in the second year  
2 of construction (2013) and continue to increase until construction is completed in 2022. AES  
3 would use xerophilic plants in landscaped areas and drought-tolerant native plants to reclaim  
4 disturbed areas. The method of irrigation would be chosen so water usage does not exceed  
5 24,670 cubic meters (6.5 million gallons) during the growing season, April 1 through October 31,  
6 as defined by the IDWR in Carlsen (2009) (AES, 2009b). This is within the appropriation for  
7 irrigation, which is 20.0 acre-feet per year, or 25,000 cubic meters (6.5 million gallons)  
8 (Carlsen, 2009).

### 9 10 **Water Quality**

11  
12 No wastewater would be generated or discharged during the preconstruction and construction  
13 period. Sanitary waste would be handled by portable systems until such time that the sanitary  
14 waste facility is operational. Short-term increases in sediment, oil and grease, fuel, and  
15 chemical constituents in surface (stormwater) runoff would be expected. Stormwater runoff  
16 would be collected in a stormwater detention basin in accordance with the NPDES Construction  
17 General Permit to contain stormwater within the boundaries of the proposed EREF property.<sup>9</sup>  
18 The stormwater detention basin would allow water to evaporate or infiltrate the ground surface  
19 and would overflow only during extreme rainfall events exceeding its design capacity (5.70 cm  
20 [2.22 inches] of rainfall in a 24-hour period) (AES, 2010a). Flood control measures would not be  
21 required because the site grade is above the 100- and 500-year floodplain elevations  
22 (see Section 3.7.1.3).

23  
24 Ground-disturbing activities such as blasting, surface grading, and excavation could increase  
25 groundwater contamination by creating conduits that could accelerate downward migration of  
26 contaminants, if present. However, these activities are not expected to affect groundwater in  
27 the ESRP aquifer because they would take place at relatively shallow depths (i.e., no deeper  
28 than 6.0 meters [20 feet]) as compared to groundwater below the proposed site, which occurs at  
29 depths of 201.5 meters (661 feet) below the ground surface (see Section 3.7.2.2).

30  
31 Chemical spills or releases around vehicle maintenance and fueling locations, storage tanks,  
32 and painting operations could infiltrate the ground surface and contaminate shallow  
33 groundwater during the preconstruction and construction phase. However, such spills and  
34 releases are not expected to affect groundwater in the ESRP aquifer because it occurs at great  
35 depths (201.5 meters [661 feet]) below the ground surface (see Section 3.7.2.2) and  
36 contaminants would likely be adsorbed by overlying soils before reaching the aquifer.

### 37 38 **Impacts Summary**

39  
40 During the preconstruction and construction period, the proposed EREF would consume water  
41 to meet potable and sanitary needs, as well as for concrete mixing, dust control, compaction of  
42 fill, and watering of vegetation. Water for these uses would be obtained from one or more  
43 onsite wells completed in the ESRP aquifer; no surface water would be used. Average and

---

<sup>9</sup> Because site preparation and construction activities would disturb an area greater than 0.4 hectare (1 acre), a NPDES Construction General Permit from EPA Region 10 and an oversight review by the IDEQ would be required (EPA, 2010b). The permit also requires the development of a SWPP Plan (EPA, 2010a).

1 peak daily water usages during this period would be well within the water right appropriation that  
2 has been transferred with the proposed property for use as industrial and irrigation water. The  
3 daily water usage would be less than 1 percent of the total daily groundwater withdrawals from  
4 the ESRP aquifer in Bonneville County. For these reasons, the impact to the regional water  
5 supply from water consumption during preconstruction and construction would be SMALL.  
6

7 No wastewater would be generated or discharged during the preconstruction and construction  
8 period. Sanitary waste would be handled by portable systems until such time that the sanitary  
9 waste facility is operational. Surface water quality could be affected by short-term increases in  
10 sediment, oil and grease, fuel, and chemical constituents in surface (stormwater) runoff.  
11 Because stormwater would be diverted to an onsite detention basin, the potential for  
12 contaminated stormwater discharging to water bodies on adjacent properties is low. For these  
13 reasons, the NRC staff concludes that the impact to surface water quality would be SMALL.  
14

15 Ground-disturbing activities have the potential to increase groundwater contamination by  
16 creating conduits that could accelerate the downward migration of contaminants, if present;  
17 chemical spills or releases could contaminate groundwater resources by infiltrating the ground  
18 surface. Because groundwater in the ESRP aquifer in the vicinity of the proposed site occurs at  
19 great depths (201.5 meters [661 feet]) and contaminants would likely be adsorbed by overlying  
20 soils before reaching the aquifer, the impact to groundwater quality would be SMALL.  
21

#### 22 **4.2.6.2 Facility Operation**

##### 23 **Water Use**

24  
25  
26 The water supply for operation of the proposed EREF would be obtained from one or more  
27 onsite wells completed in the ESRP aquifer. No surface water sources would be used. The  
28 proposed EREF would consume water to meet potable, sanitary, and process consumption  
29 needs. None of this water would be returned to its original source.  
30

31 Average and peak daily water usage during the operation period would be about 68 cubic  
32 meters (18,100 gallons) and 1567 cubic meters (416,160 gallons), respectively (AES, 2010a).  
33 Usage rates under normal operations are within the water right appropriation that has been  
34 transferred with the proposed property for use as industrial water. The annual appropriation for  
35 industrial use is 506.8 acre-feet, which is 625,000 cubic meters (165 million gallons), or about  
36 1700 cubic meters (453,000 gallons) per day (Carlsen, 2009). Usage rate estimates under peak  
37 conditions could exceed the water right appropriation during the 8-hour period following a fire  
38 when the proposed facility would be required to refill its fire water storage tanks (with an  
39 estimated usage rate of up to 1.4 cubic meters per minute [375 gallons per minute]; AES,  
40 2010a). Both the average and peak annual water use requirements would be less than  
41 1 percent of the total groundwater withdrawals of 640,000 cubic meters (169 million gallons) per  
42 day from the ESRP aquifer in Bonneville County, (as measured by the USGS in 2005  
43 (USGS 2010).  
44

45 Water would continue to be used for landscaping during the operations phase. AES would use  
46 xerophilic plants in landscaped areas and choose a method of irrigation that would limit water  
47 usage to no more than 24,670 cubic meters (6.5 million gallons) during the growing season,  
48 April 1 through October 31, as defined by the IDWR in Carlsen (2009) (AES, 2009b). This is

1 within the appropriation for irrigation, which is 20.0 acre-feet per year, or 25,000 cubic meters  
2 (6.5 million gallons) (Carlsen, 2009).

3  
4 During the first 7 years of construction (which includes the period when construction and  
5 operations activities overlap), the average annual water usage would be about 92,740 cubic  
6 meters (24.5 million gallons), with an estimated annual maximum of 98,460 cubic meters  
7 (26.0 million gallons) during the second year, decreasing to 85,550 cubic meters (22.6 million  
8 gallons) during the seventh year (AES, 2010a; Table 4-10). The maximum annual usage rate  
9 comprises about 16 percent of the annual water right appropriation that has been transferred  
10 with the proposed property for use as industrial water. Figure 4-2 shows the change in water  
11 usage for construction and operation during the overlap period, starting with construction in  
12 2011 and ending with full facility production in 2022.

13  
14 The closest and largest municipalities that rely on the ESRP aquifer for drinking water are Idaho  
15 Falls (Bonneville County) and Pocatello (Bannock County). Groundwater consumption at the  
16 proposed EREF would not affect groundwater availability in these municipalities because of  
17 their location relative to the predominant groundwater flow pattern in the ESRP aquifer  
18 (see Figure 3-24; Section 3.7.2.1). Idaho Falls is hydrologically upgradient of the proposed  
19 EREF; Pocatello is on the other (southeastern) side of the Snake River, a major discharge area.

## 20 21 **Water Quality**

22  
23 Liquid effluent generation rates would be relatively small, and no direct discharges to surface  
24 water or groundwater would occur. Wastewater volume from all sources would be about  
25 18,800 cubic meters (5 million gallons) annually. This includes approximately 59.1 cubic meters  
26 (15,600 gallons) annually of wastewater from the Liquid Effluent Collection and Treatment  
27 System and 18,700 cubic meters (4.9 million gallons) from the Domestic Sanitary Sewage  
28 Treatment Plant.

29  
30 The Liquid Effluent Collection and Treatment System would treat (by precipitation and filtration)  
31 liquid wastes such as laboratory wastes, floor washings, miscellaneous condensates, degreaser  
32 water, and spent citric acid and discharge them to the atmosphere by evaporation through the  
33 Liquid Effluent Treatment System Evaporator. None of these waste effluents would be  
34 discharged to the stormwater basins. Domestic sanitary sewage effluent would be discharged  
35 to the two Cylinder Storage Pads Stormwater Retention Basins.

36  
37 Approximately 420,090 cubic meters (111 million gallons) of stormwater would be released  
38 annually to the onsite detention and retention basins from the developed central footprint area of  
39 the proposed EREF, which comprises about 164.9 hectares (407.5 acres), or 9.7 percent of the  
40 proposed site property area. In addition, about 3.9 million cubic meters (1.0 billion gallons) of  
41 annual runoff from the undeveloped areas within the proposed site property could be expected.  
42 Site drainage is intermittent and generally flows to the south; however, runoff does not  
43 discharge into any natural surface water bodies because there are no natural surface water  
44 bodies within or near the proposed EREF property and most of the water would be consumed  
45 by evapotranspiration or infiltration before it reaches the proposed property line. Water that  
46 infiltrates the ground surface may be held in soil and taken up by plant roots or eventually make  
47 its way to the water table. It is not expected, therefore, that the proposed EREF would increase  
48 stormwater runoff to adjacent properties.



**Table 4-10 Water Use for Overlapping Years of Construction and Operations**

Year	Construction		Operations		Total
	Total Construction cubic meters (gallons)	Potable Water cubic meters (gallons)	Process Water <sup>a</sup> cubic meters (gallons)	Total Operations <sup>b</sup> cubic meters (gallons)	Total Construction and Operation cubic meters (gallons)
1	90,219 (23,833,431)	0 (0)	0 (0)	0 (0)	90,219 (23,833,431)
2	96,385 (25,462,343)	2073 (547,500)	0 (0)	2073 (547,500)	98,458 (26,009,843)
3	92,196 (24,355,478)	4145 (1,095,000)	1593 <sup>c</sup> (420,833) <sup>c</sup>	5738 (1,515,833)	97,934 (25,871,311)
4	78,448 (20,723,735)	17,409 (4,599,000)	461 (121,667)	17,870 (4,720,667)	96,318 (25,444,402)
5	77,232 (20,402,405)	17,409 (4,599,000)	691 (182,500)	18,100 (4,781,500)	95,332 (25,183,905)
6	65,374 (17,269,991)	19,896 (5,256,000)	921 (243,333)	20,817 (5,499,333)	86,191 (22,769,324)
7	61,576 (16,266,662)	22,798 (6,022,500)	1151 (304,167)	23,949 (6,326,667)	85,525 (22,593,329)
8	34,127 (9,015,331)	22,798 (6,022,500)	1382 (365,000)	24,179 (6,387,500)	58,306 (15,402,831)
9	13,540 (3,576,833)	22,798 (6,022,500)	1554 (410,625)	24,352 (6,433,125)	37,892 (10,009,958)
10	7678 (2,028,208)	22,798 (6,022,500)	1727 (456,250)	24,525 (6,478,750)	32,203 (8,506,958)
11	5437 (1,436,302)	22,798 (6,022,500)	1900 (501,875)	24,697 (6,525,375)	30,134 (7,960,677)
12	3923 (1,036,326)	22,798 (6,022,500)	2073 (547,500)	24,870 (6,570,000)	28,793 (7,606,325)

<sup>a</sup> Process water includes demineralized water, fire water, and liquid effluent water.

<sup>b</sup> Value represents industrial water use only. Irrigation water use would not exceed 24,700 cubic meters (6.5 million gallons) during the growing season, April 1 through October 31.

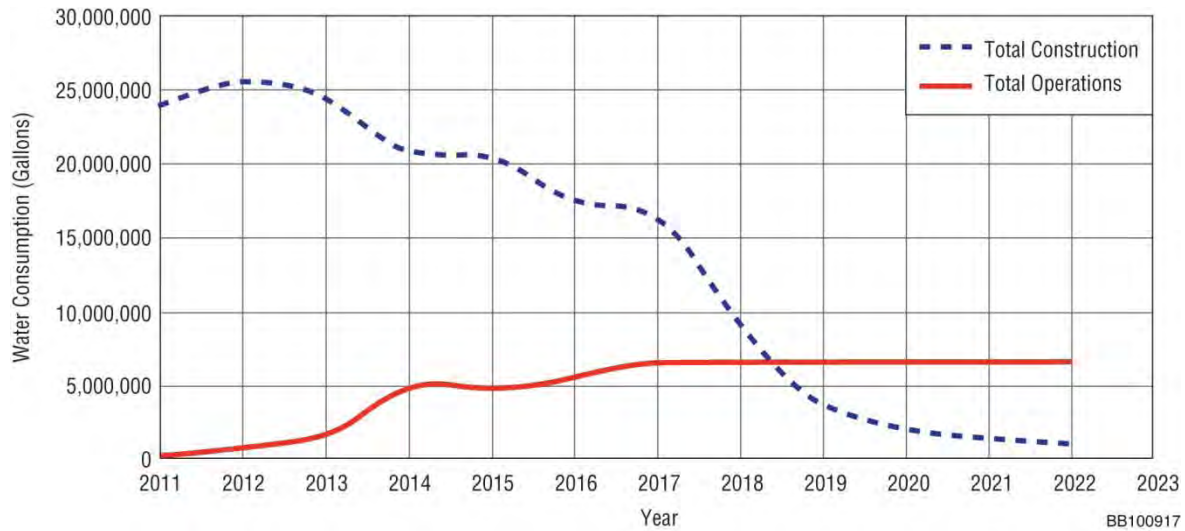
<sup>c</sup> Process (makeup and deionized) water and fire protection water values begin in the third year, just before the first cascade is placed into service. About 1363 cubic meters (360,000 gallons) of the process water demand value for this year is for a one-time fill of two Fire Water Tanks, each storing 681.5 cubic meters (180,000 gallons).

Source: AES, 2010a.

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2  
3  
4  
5  
6  
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8

**Liquid Effluent Collection and Treatment System**

Routine liquid effluents discharging to the Liquid Effluent Collection and Treatment System are listed in Table 4-10. Liquid process effluents would be contained on the proposed EREF site in collection tanks. Effluents in the tanks would be sampled and analyzed periodically to determine if treatment is needed before being discharged to the Liquid Effluent Treatment System Evaporator. About 59.1 cubic meters (15,600 gallons) of liquid process effluents would



**Figure 4-2 Water Use during Period When Construction and Operations Activities Overlap (AES, 2010a)**

be treated and discharged annually by evaporation to the atmosphere in the Liquid Effluent Treatment System Evaporator. Because no process effluents from plant operations would be discharged to the retention or detention basins or into surface water, the Liquid Effluent Collection and Treatment System would have a SMALL impact on water resources.

Cylinder Storage Pads Stormwater Retention Basins

Treated sanitary effluents from the Domestic Sanitary Sewage Treatment Plant and stormwater runoff from the concrete-paved areas in the cylinder storage areas would be discharged to two Cylinder Storage Pads Stormwater Retention Basins, located northwest of the proposed EREF footprint (Figure 4-3). The retention basins would serve an area of about 26 hectares (63 acres); each would have a storage capacity of about 83,000 cubic meters (67 acre-feet), maintaining a freeboard of 0.3 meter (1.0 feet). Water discharged from the Domestic Sanitary Sewage Treatment Plant would consist only of treated sanitary effluents; no process-related effluents would be treated there (AES, 2010a). The retention basins would be open to the air and lined to prevent infiltration, and would have no outlets. The only discharge from the retention basins would be by evaporation to the atmosphere; no direct discharge to surface water or groundwater would occur. If necessary, residual solids would be removed for treatment and disposal (AES, 2010a).

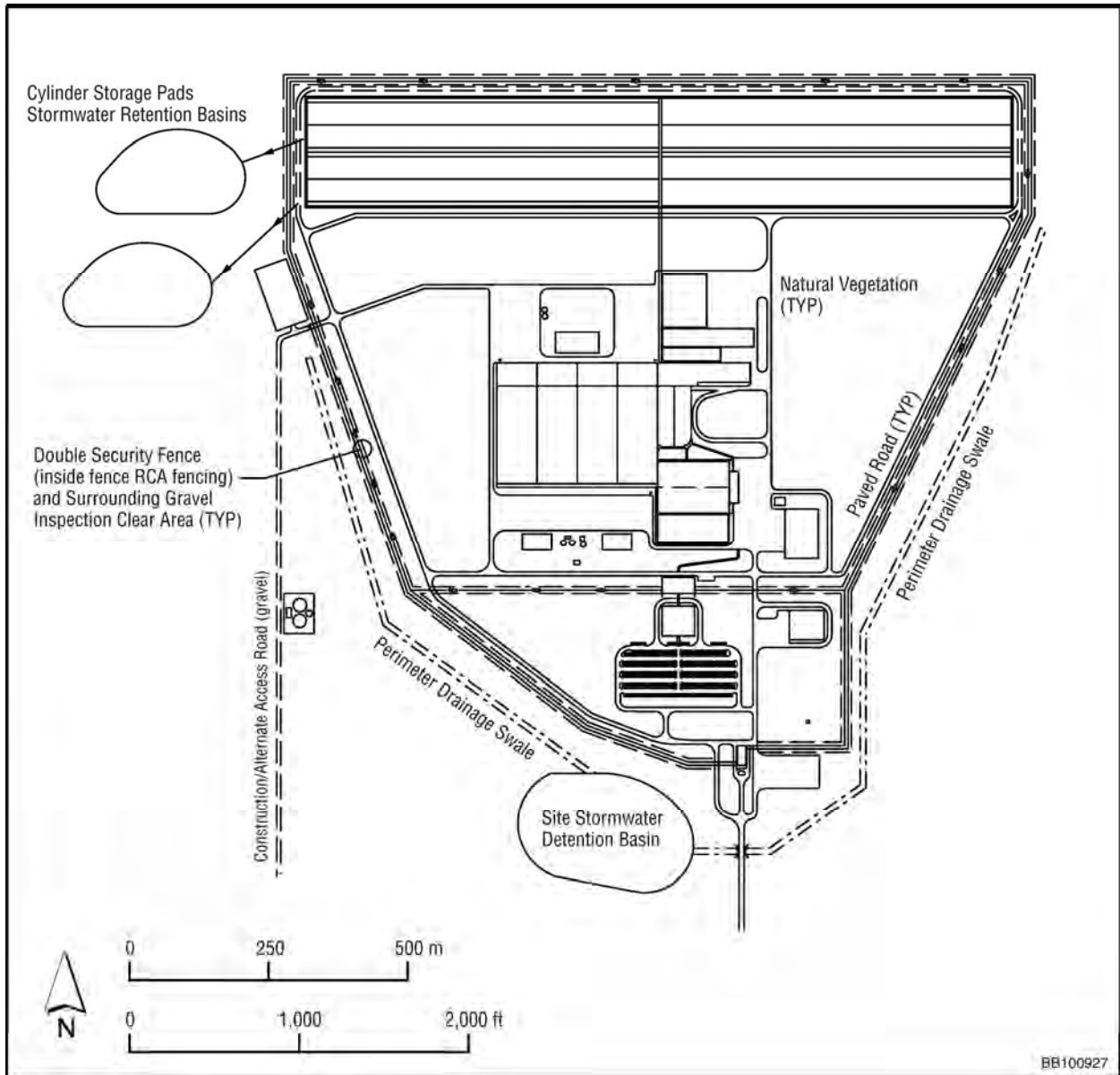
A water balance of each of the retention basins (which have identical construction), including consideration of effluent and precipitation inflows and evaporation outflows, indicates that they could be dry for up to 5 months of the year (June through October), depending on annual precipitation rates. The basins would have the capacity to hold all inflows for the life of the proposed EREF. Because all of the water discharged to the Cylinder Storage Pads Stormwater Retention Basins would evaporate, the basins would have a SMALL impact on water resources.

1 Site Stormwater Detention Basin

2

3 Site stormwater runoff from paved surfaces (except the Cylinder Storage Pad area), building  
4 roofs, and landscaped areas would be diverted to the Site Stormwater Detention Basin located  
5 to the south of the proposed EREF footprint (Figure 4-3). The Site Stormwater Detention Basin  
6 would be unlined and would serve an area of about 139.3 hectares (344 acres). It would have a  
7 storage capacity of about 32,800 cubic meters (27 acre-feet), maintaining a freeboard of  
8 0.6 meter (2 feet). Discharges from the detention basin would occur mainly by evaporation and  
9 infiltration into the ground. The detention basin would also have an outlet that would allow  
10 overflow runoff to the surrounding ground surface (and downgradient terrain) in the event of  
11 extreme rainfall events (exceeding 24-hour, 100-year design criteria) (AES, 2010a).

12



13

14

**Figure 4-3 Locations of the Proposed EREF Stormwater Basins (AES, 2010a)**

1 A water balance of the Site Stormwater Detention Basin, including consideration of effluent and  
2 precipitation inflows and evaporation outflows, indicates that it would be dry every month of the  
3 year except during rainfall events (because the evaporation rate typically exceeds the rate of  
4 effluent and precipitation inflows except during rainfall events). Most of the water discharged  
5 into the basin would seep into the ground or evaporate and would not find its way to a natural  
6 surface water body. Water seeping into the ground from the detention basin would flow  
7 vertically downward until reaching a low-permeability layer such as a sedimentary interbed.  
8 There the water could become temporarily perched or flow laterally until the low-permeability  
9 layer pinches out or contacts a higher permeability zone (e.g., fractures in the basalt). Water  
10 would migrate from the ground surface downward in a step-like manner until it reaches the  
11 saturated zone. Further transport would depend on the transmissivity and flow direction of  
12 groundwater in the aquifer.

13  
14 The water quality of the basin discharge would be typical of runoff from paved surfaces and  
15 building roofs from any industrial facility. Except for small amounts of soil products and grease  
16 expected from onsite traffic that would readily adsorb onto the soil, the plume would not be  
17 expected to contain contaminants. As a result, the Site Stormwater Detention Basin seepage  
18 would have a SMALL impact on water resources of the area.

19  
20 Compliance with the requirements of an SPCC Plan would minimize the impacts due to  
21 potential spills during operations. Following standard BMPs to minimize and contain stormwater  
22 within the proposed site boundaries would also minimize impacts on offsite surface water  
23 bodies. Sanitary wastewater generated during operation of the proposed EREF would be  
24 discharged to a lined stormwater retention basin. Because natural surface water bodies are  
25 absent within and near the proposed EREF site and no wastewater would be discharged to the  
26 ground surface, water quality impacts during the operations period would be SMALL.

## 27 28 **Impacts Summary**

29  
30 During the operations period, the proposed EREF would consume water to meet potable,  
31 sanitary, and process consumption needs. Water for these uses would be obtained from one or  
32 more onsite wells completed in the ESRP aquifer. No surface water sources would be used.  
33 Average and peak daily water usages during normal operations are within the water right  
34 appropriation that has been transferred with the proposed property for use as industrial and  
35 irrigation water. The daily water usage would be less than 1 percent of the total daily  
36 groundwater withdrawals from the ESRP aquifer in Bonneville County. For these reasons, the  
37 impact on the regional water supply would be SMALL.

38  
39 The maximum annual (industrial) water usage would occur during the second year of the  
40 construction and operations overlap period. Because this value represents only about  
41 16 percent of the annual water right appropriation that has been transferred with the proposed  
42 property for use as industrial water, the impact to the regional water supply would be SMALL.

43  
44 Liquid effluent generation rates would be relatively small, and no direct discharges to surface  
45 water or groundwater would occur. Stormwater runoff does not discharge into any natural  
46 surface water bodies because there are no natural surface water bodies within or near the  
47 proposed EREF property and most of the water is consumed by evapotranspiration or infiltration  
48 before it reaches the proposed property line. Routine liquid process effluents would be treated

1 and discharged only by evaporation to the atmosphere. Runoff from the cylinder storage areas  
2 would be discharged to two lined retention basins, each designed with the capacity to hold all  
3 inflows for the life of the proposed EREF. Therefore, the impacts to surface water and  
4 groundwater quality would be SMALL.  
5

#### 6 **4.2.6.3 Mitigation Measures**

##### 7 **Water Use**

8  
9  
10 Mitigation measures to minimize water use (relative to conventional practices) at the proposed  
11 EREF identified by AES (2010a) include:

- 12 • using low-water consumption landscaping practices
- 13 • implementing conservation practices when spraying water for dust control
- 14 • installing low-flow toilets, sinks, and showers
- 15 • localizing floor washing by using mops and self-contained cleaning machines
- 16 • incorporating closed-loop cooling systems
- 17 • eliminating evaporative losses and cooling tower blowdown by not using cooling towers

##### 18 **Water Quality**

19  
20  
21 Mitigation measures to minimize potential impacts on water quality identified by AES (2010a,b)  
22 include:

- 23 • employing BMPs to control the use of hazardous materials and fuels
- 24 • maintaining construction equipment in good repair, without visible leaks of oils, grease, or  
25 hydraulic fluids
- 26 • controlling and mitigating spills in conformance with the SPCC Plan
- 27 • ensuring all discharges to surface impoundments meet the standards for stormwater and  
28 treated domestic sanitary wastewater, and that no radiological discharges are made
- 29 • using BMPs to control stormwater runoff to prevent releases to nearby areas
- 30 • using BMPs for dust control associated with excavation and fill operations (water  
31 conservation would be considered when deciding how often dust suppression sprays would  
32 be applied)
- 33 • using silt fencing and/or sediment traps
- 34 • using only water (no detergents) for external vehicle washing



- 1 • placing stone construction pads at entrances/exits in areas where unpaved construction  
2 accesses adjoin a State road  
3
- 4 • arranging all temporary construction basins and permanent basins to provide for prompt,  
5 systematic sampling of runoff in the event of special needs  
6
- 7 • controlling water quality impacts by compliance with the NPDES Construction General  
8 Permit requirements and by applying BMPs as detailed in the site SWPP Plan  
9
- 10 • implementing a SPCC Plan for the proposed facility to identify potential spill substances,  
11 sources, and responsibilities  
12
- 13 • berming or self-containing all aboveground gasoline and diesel storage tanks  
14
- 15 • constructing curbing, pits, or other barriers around tanks and components containing  
16 radioactive wastes  
17
- 18 • handling any hazardous materials by approved methods and shipping offsite to approved  
19 disposal sites.  
20
- 21 • handling sanitary wastes by portable systems until the Domestic Sanitary Sewage  
22 Treatment Plant is available for site use and providing an adequate number of these  
23 portable systems  
24
- 25 • requiring control of surface water runoff for activities covered by the NPDES Construction  
26 General Permit  
27
- 28 • eliminating the need to discharge treated process water to an onsite basin by using  
29 evaporators in the Liquid Effluent Collection and Treatment System  
30

31 The NRC identified additional mitigation measures to reduce the impacts of stormwater runoff  
32 from impervious surfaces. The following mitigation measures are based on EPA (2005, 2007):  
33

- 34 • reducing the size of impervious surfaces (parking lots, roads, and roofs) to the extent  
35 possible  
36
- 37 • implementing a “fix it first” infrastructure policy to set spending priorities on the repair of  
38 existing infrastructure (e.g., roads) over the installation of new infrastructure  
39
- 40 • employing low-impact development strategies and practices during construction and  
41 operation activities, as defined and promoted by the EPA (EPA, 2007).  
42

#### 43 **4.2.7 Ecological Impacts** 44

45 The potential impacts on ecological resources from preconstruction, construction, and operation  
46 of the proposed EREF are evaluated in this section. Preconstruction could result in direct  
47 impacts due to habitat loss and wildlife mortality as well as indirect impacts to ecological  
48 resources in surrounding areas primarily from fugitive dust and wildlife disturbance. Impacts

1 associated with construction of facility components would primarily include wildlife disturbance  
 2 and fugitive dust. Facility operations would result in impacts primarily due to wildlife  
 3 disturbance. Impacts on plant communities and wildlife from preconstruction would be  
 4 MODERATE. Impacts from facility construction would be SMALL, and impacts from facility  
 5 operation would be SMALL.  
 6

7 According to the U.S. Fish and Wildlife Service (FWS) (FWS, 2009), no Federally listed  
 8 threatened or endangered species, or critical habitat for any species, occur in the vicinity of the  
 9 proposed EREF site; therefore, no impacts on these species or habitats would occur as a result  
 10 of the preconstruction, construction, and operation of the proposed EREF. Similarly, no impacts  
 11 on the yellow-billed cuckoo (*Coccyzus americanus*), a candidate species, would occur because  
 12 that species does not occur in the vicinity of the proposed EREF site. The greater sage-grouse  
 13 (*Centrocercus urophasianus*), a candidate species (FWS, 2010), occurs on the proposed  
 14 property and would be affected by preconstruction, construction, and operation of the proposed  
 15 EREF. Potential impacts on species identified by FWS and the Idaho Department of Fish and  
 16 Game (IDFG) are summarized in Table 4-11.  
 17

18 **4.2.7.1 Preconstruction and Construction**

19  
 20 Preconstruction and construction activities would extend over an 84-month period, with  
 21 preconstruction comprising the first 8 months. A total of approximately 240 hectares  
 22 (592 acres) of the proposed, approximately 1700-hectare (4200-acre), property to be  
 23

**Table 4-11 Special Status Species Identified for the Proposed EREF**

Common Name	Scientific Name	Status <sup>a</sup>	Impact Level
<b>Plants</b>			
Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	FT	None
<b>Animals</b>			
Canada lynx	<i>Lynx canadensis</i>	FT, ST	None
Utah valvata snail	<i>Valvata utahensis</i>	FE	None
Grizzly bear	<i>Ursus arctos</i>	FT, ST	None
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	FC, PNS	None
Greater sage-grouse	<i>Centrocercus urophasianus</i>	FC	Moderate
Ferruginous hawk	<i>Buteo regalis</i>	SGCN, PNS	Moderate
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SGCN, PNS	Small
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	SGCN	Moderate
Bald eagle	<i>Haliaeetus leucocephalus</i>	ST	Small

<sup>a</sup> FE = Federally listed as endangered, FT = Federally listed as threatened, FC = Federal candidates for listing as threatened or endangered, SGCN = Species of Greatest Conservation Need in Idaho, ST = State listed as threatened, PNS = Idaho protected nongame species.  
 Source: FWS, 2010; IDFG, 2009, 2010.

1 purchased by AES would be disturbed during preconstruction and facility construction. This  
2 area would include the proposed facility footprint as well as temporary construction areas such  
3 as temporary construction facilities, parking areas, material storage areas, and areas excavated  
4 for underground utilities. The proposed EREF footprint would occupy 186 hectares (460 acres)  
5 and would include buildings and other permanent structures such as parking areas, retention/  
6 detention ponds, cylinder storage pads, and roads, and all habitats and non-mobile biota would  
7 be eliminated within this footprint. About 53.6 hectares (132.5 acres) of the disturbed area  
8 would be replanted with native plant species following the completion of construction activities  
9 (AES, 2010a).

## 10 **Vegetation**

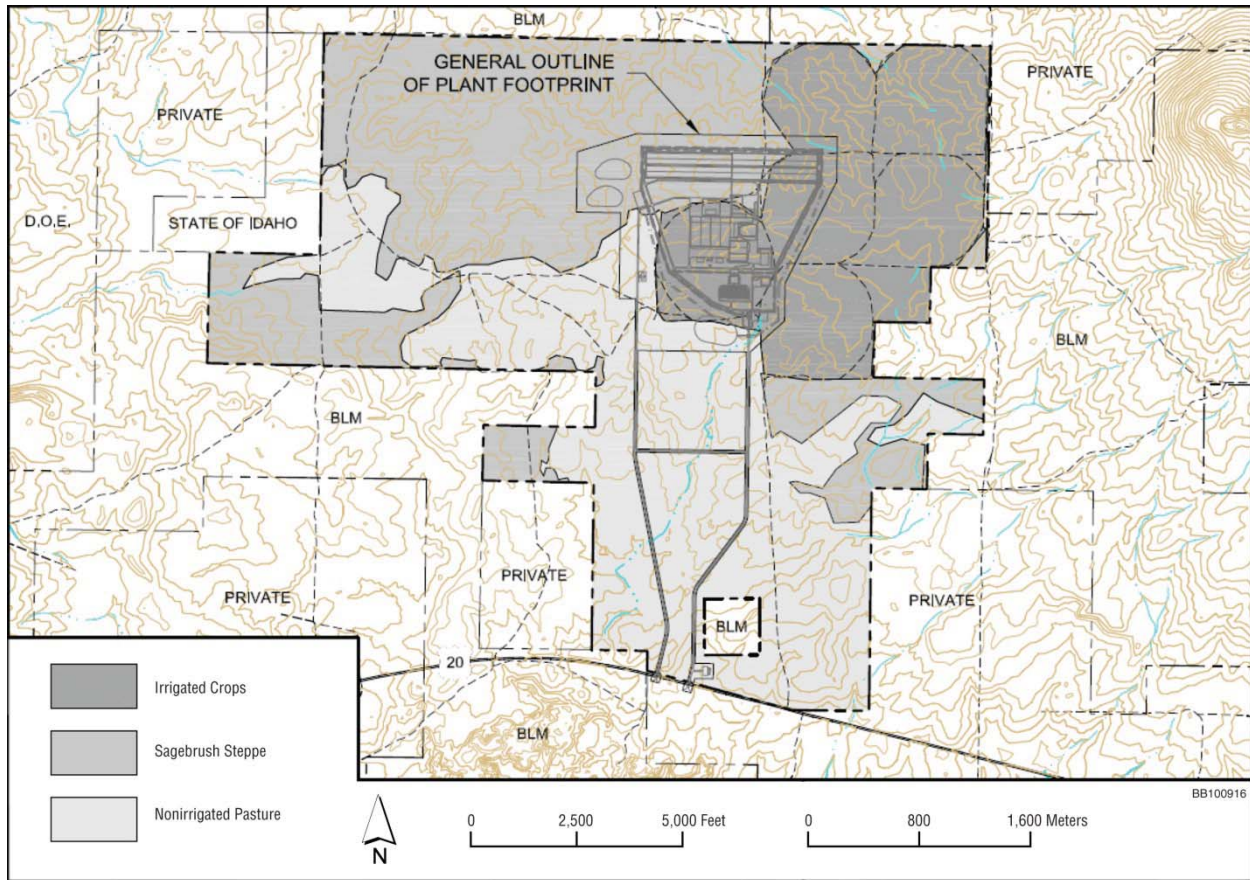
11  
12  
13 Plant communities would be affected by direct and indirect impacts associated with  
14 preconstruction and construction. Direct impacts would result from land clearing and grading as  
15 well as construction activities such as underground utility installation and road construction  
16 during preconstruction. All vegetation would be cleared from the proposed facility footprint, as  
17 well as from construction laydown areas and equipment assembly and staging areas.  
18 Approximately 75 hectares (185 acres) of sagebrush steppe habitat, 55 hectares (136 acres) of  
19 nonirrigated pasture, and 109 hectares (268 acres) of irrigated cropland would be eliminated by  
20 preconstruction and construction activities (AES, 2010a). Figure 4-4 shows the proposed EREF  
21 in relation to habitats on the proposed site. No rare or unique habitats, wetlands, riparian areas,  
22 or aquatic habitat would be impacted by preconstruction and construction.

23  
24 Sagebrush steppe is the predominant plant community type in the region, and provides valuable  
25 habitat for numerous native species. The sagebrush steppe that would be lost under the  
26 proposed action is a small proportion of sagebrush (*Artemisia* spp.) habitat in the area  
27 (0.7 percent within an 8-kilometer [5-mile] radius of the center of the proposed EREF site)  
28 (Landscape Dynamics Lab, 1999). Because the sagebrush steppe habitat that would be lost is  
29 located adjacent to irrigated cropland and nonirrigated pasture, habitat fragmentation of this  
30 community type would be limited.

31  
32 The exclusion of livestock from the remaining 1514 hectares (3740 acres) of the proposed  
33 property outside the proposed EREF footprint would increase species diversity and overall  
34 habitat quality in the remaining sagebrush steppe habitat. Spring forb production would likely  
35 increase with the removal of grazing, and non-native species, such as cheatgrass (*Bromus*  
36 *tectorum*), would likely decrease due to increased shading. Livestock exclusion would also  
37 likely result in an increase in native plant species in the remaining nonirrigated pasture habitat.

38  
39 Nonirrigated pasture is a highly modified and degraded habitat, resulting from the removal of  
40 shrubs from sagebrush steppe and the planting of crested wheatgrass (*Agropyron cristatum*),  
41 which has become the dominant species, and other grasses. Small areas of native species are  
42 associated with rock outcrops. Because of the high degree of disturbance, this community type  
43 includes a high representation of non-native species, particularly crested wheatgrass. The loss  
44 of 55 hectares (136 acres) of this habitat type would have a negligible effect on native  
45 vegetation.

46  
47 Fugitive dust levels would, in certain conditions, exceed NAAQS at the proposed EREF property  
48 boundary during portions of the preconstruction period (see Section 4.2.4.1). Deposition of



**Figure 4-4 Proposed EREF Footprint Relative to Vegetation (AES, 2010a)**

fugitive dust could occur in nearby offsite areas, potentially including the Hell’s Half Acre Wilderness Study Area (WSA) immediately south of the proposed EREF site near the proposed new access road entrance. Deposition of fugitive dust can adversely affect plants, potentially reducing productivity and species diversity. However, soils in the region are wind-formed soils, and plant species in native habitats are regularly exposed to wind-generated fugitive dust. Because of the smaller, finer leaf structure of the native evergreen shrubs, grasses, and forbs, they may be less susceptible to the effects of fugitive dust deposition (Hlohowskyj et al., 2004). Impacts of fugitive dust would be minor.

Disturbed soils could provide an opportunity for the establishment and spread of non-native invasive species. Seven non-native species have been identified on the proposed EREF property (see Section 3.8). Additional non-native species could be introduced by construction equipment. Herbicides would not be used during the preconstruction and construction period (AES, 2010a). Invasive species present in low population densities on the proposed site, such as Canada thistle (*Cirsium arvense*), could develop large populations during the preconstruction and construction overlap period and contribute to increased occurrences in the sagebrush steppe habitat beyond the proposed site. Although these species are known to already occur in various habitats in the region, the development of increased seed sources in disturbed areas during the preconstruction and construction period could increase the spread of these species in nearby habitats.



1 Stormwater runoff from construction areas could result in erosion of disturbed soils and could be  
2 a source of sedimentation. Although the release of surface runoff or sediment to areas outside  
3 of the proposed EREF site is unlikely, if sediment was released from the proposed EREF site,  
4 plant communities in adjacent areas could be adversely affected by sediment accumulation,  
5 resulting in decreased plant cover and diversity. Also, sedimentation could promote the  
6 establishment and spread of invasive species.

7  
8 Although spills are unlikely, accidental releases of hazardous materials such as fuels, lubricants,  
9 or other materials used or stored on the proposed EREF site could adversely affect biotic  
10 communities near and downgradient from a spills. The potential impacts of a spill would depend  
11 on the material spilled, its volume, its location, the season, and the efficacy of cleanup  
12 measures. The movement of spilled materials to areas off the proposed EREF project site  
13 would be unlikely due to the infiltration capacity of soils on the proposed site.

14  
15 Impacts on plant communities due to the loss of 75 hectares (185 acres) of sagebrush steppe  
16 habitat as a result of preconstruction and construction would be MODERATE.

### 17 **Wildlife**

18  
19  
20 Vegetation removal and site grading would result in direct impacts on wildlife present on the  
21 proposed EREF site. Preconstruction would result in mortality of less mobile species, such as  
22 reptiles and small mammals, and nesting or burrowing species; species with greater mobility  
23 would likely be displaced to nearby suitable habitat. Increased competition in these areas could  
24 result in reduced survival of displaced individuals. The loss of 75 hectares (185 acres) of  
25 sagebrush steppe would particularly affect individuals of sagebrush obligate species that would  
26 be present at the start of preconstruction, due to their restriction to sagebrush habitats for  
27 breeding, nesting, brood-rearing, and foraging. However, species currently present on the  
28 proposed site occur throughout the region, and preconstruction and construction would not  
29 result in the local elimination of any wildlife species.

30  
31 The sagebrush steppe community type provides habitat for numerous wildlife species. As noted  
32 above, the sagebrush steppe that would be lost under the proposed action is a small proportion  
33 of sagebrush steppe in the area (0.7 percent within an 8-kilometer [5-mile] radius of the center  
34 of the proposed EREF site). Some wildlife species are totally dependent on the sagebrush  
35 steppe ecoregion for their livelihood and are classified as sagebrush obligates. Depending on  
36 the species and specific habitat requirements, this loss of sagebrush habitat could potentially  
37 reduce available habitat for various life stages, such as breeding, nesting, brood rearing, or  
38 wintering. Pygmy rabbits (*Brachylagus idahoensis*), a sagebrush obligate species and Idaho  
39 species of conservation concern, live in burrows. Because they are abundant in similar habitats  
40 at the nearby INL (S.M. Stoller Corporation, 2001), pygmy rabbits may occur on the proposed  
41 site. Clearing and grading of sagebrush steppe habitat could potentially result in mortality of  
42 pygmy rabbits as well as habitat loss.

43  
44 Migratory birds could be affected by preconstruction and construction activities. Several  
45 migratory species, such as sage thrasher (*Oreoscoptes montanus*), sage sparrow (*Amphispiza*  
46 *belli*), and Brewer's sparrow (*Spizella breweri*), which were observed on the proposed EREF  
47 property, are also sagebrush obligate species (see Section 3.8.2). Disturbance of active nests  
48 would be unlikely due to the seasonal timing of land clearing, as clearing would occur outside



1 the nesting period. However, depending on specific habitat requirements, the loss of sagebrush  
2 steppe from the proposed EREF property could reduce the amount of habitat available for  
3 nesting of some species, and could potentially reduce the local overall level of nesting success.  
4 Because these species' populations occur over the large area of sagebrush habitat that is  
5 available in the region, population-level effects for the region would be unlikely.  
6

7 Wildlife species with large home ranges, such as pronghorn antelope (*Antilocapra americana*),  
8 would likely avoid the proposed EREF site area; however, no impacts on local populations  
9 would occur due to habitat loss because of the contiguous extensive habitat available in the  
10 vicinity. Although the proposed EREF site is located within the crucial winter range for  
11 pronghorn, the total area affected, including an avoidance zone, would represent a small portion  
12 of that habitat. Migration patterns of other wildlife, such as elk (*Cervus canadensis*) or mule  
13 deer (*Odocoileus hemionus*), would not be altered due to the extensive undisturbed landscape  
14 in the region available for migratory movements. Onsite roads would present a hazard to  
15 wildlife from construction-related traffic, and traffic would increase on roads off the proposed  
16 site. Wildlife mortality from vehicles could increase; however, limiting vehicle speeds on the  
17 proposed site would help reduce impacts on wildlife (AES, 2010a).  
18

19 Wildlife in nearby habitats would be disturbed by preconstruction and construction activity,  
20 human presence, and noise. Preconstruction and construction would result in increased noise  
21 levels from various sources, such as equipment operation during site grading  
22 (see Section 4.2.8). In addition, activities such as blasting would result in periodic high noise  
23 levels. While current background noise levels are approximately 30 A-weighted decibels (dBA),  
24 noise levels of approximately 61 dBA are estimated to occur at the north boundary of the  
25 proposed EREF property, the closest boundary to the industrial footprint of the proposed facility  
26 (for comparison, an automobile at 15 meters (50 feet) ranges from about 60 to 90 dBA; see  
27 Section 3.9.1). As a result, many wildlife species in adjacent habitats would be expected to  
28 avoid the vicinity of the proposed project site. Many species, such as migratory birds, would  
29 continue to be affected by noise throughout the 84-month preconstruction and construction  
30 period.  
31

32 The loss of sagebrush steppe habitat would likely affect greater sage-grouse. No sage-grouse  
33 leks (breeding areas) were found during surveys of the proposed property on May 6–7, 2008  
34 (MWH, 2008a) and April 28–29, 2010 (North Wind, 2010). Recommended survey dates are  
35 early March to early May (Connelly et al., 2003); specifically, lek surveys should be conducted  
36 March 25 through April 30 for low elevation areas and April 5 through May 10 for higher  
37 elevations (ISAC 2006). At approximately 5200 feet (1600 meters) MSL, the proposed EREF  
38 property could be considered a high elevation site. Surveys of the proposed EREF property  
39 indicated that the sagebrush steppe on or near the proposed property is used by the local sage-  
40 grouse population (AES, 2010a; MWH, 2008 a,b,c; MWH, 2009). However, extensive  
41 sagebrush habitat is available in the region, and loss of habitat on the proposed site would not  
42 threaten the local sage-grouse population.  
43

44 Sage-grouse annually migrate between seasonal use areas in southeast Idaho, and populations  
45 occupy relatively large areas (Leonard et al., 2000; BLM/DOE, 2004). In one Idaho study,  
46 conducted northeast of the proposed EREF site, the average distance sage-grouse moved from  
47 their lek was 3.5 kilometers (2.2 miles) in spring, 12.1 kilometers (7.52 miles) in summer,  
48 21.9 kilometers (13.6 miles) in fall, and 27.7 kilometers (17.2 miles) in winter

1 (Leonard et al., 2000). These sage-grouse utilized large areas over the course of a year,  
2 moving an average of 107 kilometers (66.5 miles). A population may occupy a summer home  
3 range of 3 to 7 square kilometers (1-3 square miles), while a winter home range may be more  
4 than 140 square kilometers (54 square miles) (Connelly et al., 2000).

5  
6 Sage-grouse habitat requirements include breeding habitat (consisting of nesting habitat and  
7 early brood-rearing habitat), summer late brood-rearing habitat, and fall and winter habitat.

8  
9 Within breeding habitat, female sage-grouse may travel more than 20 kilometers (12.4 miles)  
10 from lek to nest in the spring (Connelly et al., 2000). At INL, nesting sites have been known to  
11 be up to 18 kilometers (11 miles) from leks (BLM/DOE, 2004). Studies in Idaho indicate that  
12 nesting habitat includes a grass height of 15–34 centimeters (5.9–13 inches), coverage of  
13 3–30 percent, and sagebrush height of 58–79 centimeters (23–31 inches) at the nest site and  
14 an overall canopy cover of 15–38 percent (Connelly et al., 2000). Guidelines for productive  
15 sage-grouse breeding habitat include a sagebrush height of 30–80 centimeters (10–30 inches),  
16 varying by moisture regime, with a cover of 15–25 percent, and a grass/forb height more than  
17 18 centimeters (7.1 inches) with a cover of at least 15 percent and in mesic sites greater than  
18 10 percent forb cover (Connelly et al., 2000). Greater nesting success occurs in areas of  
19 greater sagebrush canopy cover and greater height and cover of grasses  
20 (Connelly et al., 2000). Early brood-rearing habitat is usually near nesting areas and is  
21 characterized by a high species diversity and abundant forb cover with tall grasses and forbs,  
22 although sagebrush cover may be relatively open with about 14 percent cover  
23 (Connelly et al., 2000).

24  
25 Summer habitats for sage-grouse broods include a variety of habitat types but are usually mesic  
26 areas with a relatively abundant forb component (Connelly et al., 2000). Guidelines for  
27 productive sage-grouse summer late brood-rearing habitat include a sagebrush canopy cover of  
28 10–25 percent with a height of 40–80 centimeters (16–31 inches), along with a grass/forb cover  
29 greater than 15 percent (Connelly et al., 2000), although the grass/forb cover can be greater  
30 than 60 percent (Braun et al., 2005).

31  
32 Fall habitat is frequently located on higher north-facing slopes that provide succulent native  
33 forbs (Braun et al., 2005). Sage-grouse begin to shift toward traditional winter use areas and  
34 the increased use of areas with a sagebrush canopy cover greater than 20 percent and more  
35 than 25 centimeters (9.8 inches) tall (Braun et al., 2005).

36  
37 Winter habitat requires an adequate sagebrush component, as this constitutes nearly the entire  
38 winter diet of sage-grouse (Connelly et al., 2000; Braun et al., 2005). Studies in Idaho indicate  
39 the sagebrush canopy above snow may range 15–26 percent with a height of  
40 26–46 centimeters (10–18 inches) above snow; studies that measured the entire canopy found  
41 a 38 percent coverage of sagebrush and a sagebrush height of 56 centimeters (22 inches)  
42 (Connelly et al., 2000). Guidelines for productive sage-grouse winter habitat include a  
43 sagebrush canopy cover of 10–30 percent and height of 25–35 centimeters (9.8–14 inches)  
44 above snow (Connelly et al., 2000). Sage-grouse tend to use south- and southwest-facing  
45 slopes in hilly areas (Braun et al., 2005).

46  
47 The canopy coverage of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) on  
48 the proposed EREF property is approximately 16 percent and that of threetip sagebrush

1 (*Artemisia tripartita*) is approximately 0.3 percent (AES, 2010a). The total areal cover of all  
2 plants, excluding mosses, is about 60 percent. The total areal cover of shrubs is about  
3 34 percent, of grasses about 20 percent, and forbs about 6 percent. The density of Wyoming  
4 big sagebrush ranges from 6000 plants per hectare (2428 per acre) for those less than  
5 40 centimeters (15.7 inches) in height to 6900 plants per hectare (2792 per acre) for those at  
6 least 40 centimeters (15.7 inches) in height. The average maximum vegetation height is about  
7 43 centimeters (17 inches).

8  
9 Although the spatial relationships of habitat used by sage-grouse are not well understood  
10 (Braun et al., 2005), habitat characteristics can help evaluate potential use of a particular habitat  
11 by sage-grouse populations. The canopy cover and height of sagebrush on the proposed EREF  
12 property would provide suitable habitat for sage-grouse. Although the grass cover within this  
13 community would potentially provide habitat, forb production is relatively low. The proposed  
14 EREF property appears to be located within the annual range of a local sage-grouse population,  
15 and sage-grouse evidently use the proposed site. Sage-grouse were observed, and male sage-  
16 grouse were heard, just north of the proposed property during surveys in 2008, and evidence of  
17 the presence of sage-grouse was observed on the proposed property in 2008 and 2009. The  
18 nearest known lek is located approximately 5.6 kilometers (3.5 miles) from the boundary of the  
19 proposed site, and numerous leks are located within 16 kilometers (10 miles). The loss of  
20 75 hectares (185 acres) of sagebrush steppe, plus an additional area of avoidance around the  
21 proposed EREF, could reduce available habitat for the local sage-grouse population; however,  
22 based on the size of seasonal use areas in Idaho and elsewhere, the area likely represents a  
23 small portion of seasonal habitat use.

24  
25 The exclusion of livestock from grazing the proposed 1700-hectare (4200-acre) EREF property  
26 would result in an increase in species diversity and overall habitat quality in the remaining  
27 sagebrush steppe habitat, including an increase in available forage in the spring, especially  
28 forbs production and a decrease in non-native species, such as cheatgrass. Livestock  
29 exclusion would also likely result in an increase in native plant species in the remaining  
30 nonirrigated pasture habitat. These changes in habitat quality would likely increase the habitat  
31 value for sage-grouse.

32  
33 Greater sage-grouse breeding behavior at lek sites can be affected by high noise levels that are  
34 more than 10 dBA above ambient levels. The nearest known lek is located approximately  
35 5.6 kilometers (3.5 miles) from the boundary of the proposed EREF site. At that distance, noise  
36 levels due to preconstruction and construction of the proposed EREF, other than from blasting,  
37 are estimated to be approximately 35 dBA (see Section 4.2.8.1). This is less than 10 dBA  
38 above the ambient levels of approximately 30 dBA, measured at the northwest corner of the  
39 proposed EREF property (see Section 3.9). In addition, recommendations for avoiding  
40 disturbance to breeding sage-grouse from construction of energy-related facilities in the Upper  
41 Snake Sage-Grouse Planning Area include maintaining a distance of at least 3.2 kilometers  
42 (2 miles) from active leks (USSLWG, 2009), while the proposed EREF site boundary is  
43 approximately 5.6 kilometers (3.5 miles) from the nearest lek. Impacts on sage-grouse from  
44 preconstruction/construction-related noise would be minimal.

45  
46 Ferruginous hawks (*Buteo regalis*), an Idaho species of conservation concern, are known to  
47 nest within 8 kilometers (5 miles) of the proposed EREF site (IDFG, 2009). Impacts on this  
48 species could result from habitat loss or human disturbance in the vicinity of nesting sites.

1 Ferruginous hawks hunt for small mammals, such as ground squirrels, on grassland and shrub-  
2 steppe habitats. The average home range for breeding males in Idaho is approximately  
3 7 to 8 square kilometers (2.7 to 3.0 square miles) (IDFG, 2005). The loss of habitat as a result  
4 of proposed EREF preconstruction/construction could affect a locally nesting pair; however,  
5 grassland and shrub-steppe habitats are relatively abundant in the area. Ferruginous hawks  
6 are easily disturbed during the breeding season, and disturbance may result in nest  
7 abandonment (White and Thurow, 1985; Dechant et al., 1999). Noise and human presence  
8 associated with preconstruction and construction activities for the proposed EREF could  
9 potentially impact ferruginous hawks in the vicinity of the proposed project.

10  
11 Townsend's big-eared bats (*Corynorhinus townsendii*), an Idaho species of conservation  
12 concern, use lava tube caves, approximately 8 kilometers (5 miles) from the proposed EREF  
13 site, for roosts and winter hibernacula (IDFG, 2009). This species forages for insects, primarily  
14 moths, above shrub-steppe habitats (Pierson et al., 1999). The loss of 75 hectares (185 acres)  
15 of sagebrush steppe would constitute a small impact on the foraging habitat of local bat  
16 populations. Noise from preconstruction and facility construction would be unlikely to disturb  
17 roosting or hibernating bats.

18  
19 The sharp-tailed grouse (*Tympanuchus phasianellus*), an Idaho species of conservation  
20 concern, is known to occur in the vicinity of the proposed EREF site (IDFG, 2010). The sharp-  
21 tailed grouse does not occur throughout the Upper Snake River Plain, and its distribution in the  
22 proposed EREF site area is somewhat limited (IDFG, 2005). The loss of shrub and grass  
23 habitat as a result of vegetation clearing during preconstruction could reduce habitat used by  
24 sharp-tailed grouse in the area. No sharp-tailed grouse leks are known to occur in the vicinity of  
25 the proposed EREF site; however, disturbance from noise and human presence would affect  
26 sharp-tailed grouse use of habitat near the proposed EREF site.

27  
28 The bald eagle (*Haliaeetus leucocephalus*), listed as a threatened species by the State of Idaho,  
29 nests along the Snake River and winters near open water (IDFG, 2005; FWS, 2007). Foraging  
30 is generally near rivers, lakes, or other water bodies. Disturbance during nesting is considered  
31 the greatest threat to bald eagles in Idaho (IDFG, 2005). Because bald eagles do not nest in  
32 the vicinity of the proposed EREF and winter habitat does not occur in the vicinity, the bald  
33 eagle would be unlikely to be affected by disturbance or habitat loss resulting from  
34 preconstruction or construction.

35  
36 The implementation of BMPs and mitigation measures during construction would reduce  
37 potential impacts on wildlife on and in the vicinity of the proposed EREF. Therefore, impacts on  
38 wildlife due to preconstruction and construction would be SMALL to MODERATE.

39  
40 Preconstruction activities would result in most (95 percent) of the habitat losses associated with  
41 development of the proposed EREF, while approximately 5 percent of habitat loss would be  
42 attributable to the construction of facility components. Preconstruction and construction are  
43 expected to extend over an 84-month time period, with the preconstruction phase estimated to  
44 comprise 10 percent of that period and facility component construction comprising 90 percent.  
45 Some impacts, such as wildlife disturbance due to noise and human presence, would occur  
46 throughout the long facility construction period. Because the greatest ecological impacts would  
47 be attributable to habitat loss and mortality associated with preconstruction activities, the  
48 estimated contribution to ecological impacts from preconstruction would be 80 percent, with

1 20 percent from construction. On this basis, preconstruction would result in MODERATE  
2 impacts, and facility construction would result in SMALL impacts.

#### 3 4 **4.2.7.2 Facility Operation**

5  
6 Limited facility operations would begin 8 years before the end of the construction phase.  
7 Operation of the proposed EREF is assumed to continue for approximately 30 years.  
8 Permanent structures of the proposed EREF would include buildings, depleted UF<sub>6</sub> storage  
9 pads, retention and detention basins, parking areas, and local roadways. Stormwater runoff  
10 from buildings, roads, and parking areas would be collected in a detention basin. Runoff from  
11 the Cylinder Storage Pads would be collected in two lined retention basins, which would also  
12 receive treated domestic sanitary effluent. The detention basins would have an overflow  
13 discharge, while the retention basins would be designed to prevent overflow (AES, 2010a).  
14 Potential impacts from stormwater runoff, such as erosion and sedimentation, would be  
15 minimized by the stormwater collection basins.

#### 16 17 **Vegetation**

18  
19 Maintenance activities associated with facility operation would include the periodic application of  
20 herbicides along roadways, the security fence, and the industrial area to control noxious weed  
21 species (AES, 2010a). Invasive species populations in areas of the proposed property outside  
22 of the industrial footprint would remain unaffected. Although nontarget species in the area could  
23 be impacted by drift during herbicide application, the amount of drift and associated effects  
24 would be very small.

25  
26 The area of native plant communities would increase as the remaining irrigated crop areas and  
27 temporary construction areas would be replanted using native plant species at the conclusion of  
28 the preconstruction and construction phase. Successful restoration of habitats in arid climates  
29 is difficult, however, and extended periods of time may be required (Monsen et al., 2004). Thus,  
30 the restored plant community may be different from regional sagebrush steppe communities in  
31 species composition and shrub cover (Newman and Redente, 2001; Paschke et al., 2005).

32  
33 Although operation of the proposed EREF could result in some impacts on plant communities,  
34 habitat quality in the undisturbed areas would continue to improve from the exclusion of cattle,  
35 and the area of native communities would increase from the replanting of disturbed areas.  
36 Therefore, impacts on plant communities from facility operation would be SMALL.

#### 37 38 **Wildlife**

39  
40 Wildlife use of the undeveloped portions of the proposed AES property may increase as a result  
41 of improved habitat quality from the exclusion of livestock, and because the existing boundary  
42 fence around the proposed 1700-hectare (4200-acre) property would be modified to be  
43 conducive to access by wildlife, such as pronghorn antelope (smooth wire would be used for the  
44 bottom wire, which would be at least 40 centimeters [16 inches] above the ground  
45 [AES, 2010a]). However, many wildlife species would likely avoid areas near the proposed  
46 facility due to noise, structures, and human presence, although noise and human presence  
47 would decrease following the construction period.



1 The proposed EREF would not discharge process water to the onsite basins. However, the  
2 retention basins would receive Cylinder Storage Pad runoff and treated domestic sanitary  
3 effluents, and the detention basins would receive general site stormwater runoff. The retention  
4 and detention basins would be fenced to minimize access by wildlife. However, birds, reptiles,  
5 tiger salamanders (*Ambystoma tigrinum*), or small mammals could potentially enter the basins  
6 and be exposed to contaminants when the basins contain water. Contaminants in the retention  
7 basins could include water treatment chemicals and, potentially, small amounts of radionuclides.  
8 Small amounts of oil, grease, or other automotive fluids could be present in the detention  
9 basins. Because of the scarcity of surface water in the region, birds and small wildlife species  
10 would likely be attracted to the basins.

11  
12 Collisions with vehicles along the entrance road would continue to be a hazard for wildlife, and  
13 may increase if wildlife use of the habitat on the proposed site increases. In addition, facility  
14 buildings could present a collision hazard for birds. Lights would be located along roadways  
15 and near building areas. Nocturnal insects attracted to lights could be preyed upon by bats,  
16 such as the Townsends big-eared bat.

17  
18 Although the Cylinder Storage Pads would be fenced to exclude wildlife, entry to the storage  
19 pads by small species could occur. A small number of individuals could subsequently be  
20 exposed to elevated radiation levels from the cylinders. However, it is unlikely that wildlife  
21 would be present for extended periods. Atmospheric releases of materials such as UF<sub>6</sub> could  
22 also result in exposures of wildlife or plants. The U.S. Department of Energy (DOE) has  
23 established radiation dose limits of 1 rad (10 milligray) per day for the protection of terrestrial  
24 plants and 0.1 rad (1 milligray) per day for terrestrial animals (DOE, 2002). Based on  
25 atmospheric releases of radionuclides from the proposed EREF, estimated doses to biota in the  
26 surrounding area would be below the DOE limits. Therefore, impacts on biota from exposure to  
27 elevated radiation levels would also be small.

28  
29 Greater sage-grouse would also be affected by factors related to operation of the proposed  
30 EREF. Sage-grouse would likely avoid areas near the proposed facility due to noise, visibility of  
31 structures, lighting, and human presence. Avoidance of otherwise suitable habitat would result  
32 in a larger area of effective loss of habitat for the local population and would displace individuals  
33 to other areas of their seasonal range. In addition, the EREF property fence could be a source  
34 of mortality for sage-grouse. Although, as noted above, the fence would be modified for access  
35 by wildlife, fences are known to create a collision hazard for sage-grouse (ISAC, 2006). The  
36 addition of markers to increase wire visibility (AES, 2010g) could help reduce collision-related  
37 mortality.

38  
39 Operation of the proposed EREF could result in impacts on wildlife and plant communities on  
40 the proposed EREF site and occupying nearby habitats. However, the implementation of  
41 mitigation measures and BMPs would reduce potential impacts. Therefore, impacts on  
42 ecological resources from facility operation would be SMALL.

#### 43 44 **4.2.7.3 Mitigation Measures**

45  
46 This section presents mitigation measures to minimize impacts on ecological resources.  
47 Included are mitigation measures that AES has committed to (AES, 2010a) and mitigation  
48 measures identified during the NRC staff's review.

49

1 **Mitigation Measures Identified by AES**  
2

- 3 • unused open areas, including areas of native grasses and shrubs, would be left undisturbed  
4 and managed for the benefit of wildlife  
5  
6 • native plant species (i.e., low-water-consuming plants) would be used to revegetate  
7 disturbed areas, to enhance wildlife habitat  
8  
9 • the detention and retention basins would be fenced to limit access by wildlife  
10  
11 • vehicle speeds on the proposed site would be reduced  
12  
13 • dust suppression BMPs would be used to minimize dust, thereby reducing the impact of  
14 fugitive dust on nearby plant communities; when required, and at least twice daily, water  
15 would be applied to control dust in construction areas in addition to other fugitive dust  
16 prevention and control methods  
17  
18 • during construction and operations, all lights would be focused downward  
19  
20 • the boundary fence around the proposed property would be improved to allow pronghorn  
21 access to the remaining sagebrush steppe habitat on the proposed property; the fence  
22 would include a smooth top wire no more than 42 inches above the ground, adequate wire  
23 spacing to prevent wildlife entanglement, a smooth bottom wire approximately 16 to  
24 18 inches above the ground, and durable markers to increase wire visibility (AES, 2010g)  
25  
26 • livestock grazing on the proposed property would be eliminated when the proposed EREF  
27 becomes operational  
28  
29 • measures would be taken to protect migratory birds during construction and  
30 decommissioning, e.g., clearing or removal of habitat, such as sagebrush, including buffer  
31 zones, would be performed outside of the migratory bird breeding and nesting season;  
32 additional areas to be cleared would be surveyed for active nests during the migratory bird  
33 breeding and nesting season; activities would be avoided in areas containing active nests of  
34 migratory birds; the FWS would be consulted to determine appropriate actions regarding the  
35 taking of migratory birds, if needed  
36  
37 • herbicides would not be used during construction, but would be used in limited amounts  
38 along the access roads, plant area, and security fence surrounding the plant to control  
39 noxious weeds during operation of the plant; herbicides would be used according to  
40 government regulations and manufacturer's instructions to control noxious weeds  
41  
42 • eroded areas would be repaired and stabilized, and sediment would be collected in a  
43 stormwater detention basin  
44  
45 • erosion- and runoff-control methods, both temporary and permanent, would follow BMPs  
46 such as minimizing the construction footprint to the extent possible, limiting site slopes to a  
47 horizontal-to-vertical ratio of four to one or less, using sedimentation detention basins,

1 protecting adjacent undisturbed areas with silt fencing and straw bales, as appropriate, and  
2 using crushed stone on top of disturbed soil in areas of concentrated runoff

- 3
- 4 • cropland areas on the proposed property would be planted with native species when the
- 5 proposed EREF becomes operational
- 6
- 7 • consider all recommendations of appropriate State and Federal agencies, including the
- 8 Idaho Department of Fish and Game and the FWS
- 9

#### 10 **Additional Mitigation Measures Identified by NRC**

- 11
- 12 • plant disturbed areas and irrigated crop areas with native sagebrush steppe species to
- 13 establish native communities and prevent the establishment of noxious weeds; plant
- 14 immediately following the completion of disturbance activities and the abandonment of crop
- 15 areas
- 16
- 17 • develop and implement a noxious weed control program to prevent the establishment and
- 18 spread of invasive plant species; hose down tires and undercarriage of off-road vehicles
- 19 prior to site access to dislodge seeds or other propagules of noxious weeds; monitor for
- 20 noxious weeds throughout the construction and operations phases and immediately
- 21 eradicate new infestations; minimize indirect impacts of weed control activities, such as
- 22 herbicide effects on nontarget species, and soil disturbance and fire hazards from vehicle
- 23 operation in undisturbed areas during weed control activities
- 24
- 25 • develop areas that will retain water of suitable quality for wildlife and provide wildlife access
- 26 to such areas with suitable water quality
- 27
- 28 • for basins with water quality unsuitable for wildlife, use animal-friendly fencing and netting or
- 29 other suitable material over basins to prevent use by migratory birds
- 30
- 31 • place metal reflectors on the top wire of the fence along the AES property boundary, to
- 32 reduce sage-grouse mortality resulting from collisions with the fence
- 33
- 34 • coordinate with Idaho National Laboratory in monitoring risks to sage-grouse and other
- 35 sensitive species and identifying measures to reduce risks and protect these species and
- 36 their habitat, particularly sagebrush steppe
- 37
- 38 • coordinate with Idaho Department of Fish and Game to determine corrective action or
- 39 mitigation for the offsite public lands lost to wildlife due to project effects
- 40

#### 41 **4.2.8 Noise Impacts**

42  
43 Noise impacts from preconstruction and construction were evaluated based on the number and  
44 type of construction equipment proposed to be on the proposed EREF site during those periods,  
45 together with other relevant parameters associated with those actions. The noise assessment  
46 also included an assessment of incremental noise along US 20 resulting from travel to and from  
47 the proposed site by the construction and operating workforces, as well as resulting from trucks  
48 delivering equipment and materials during construction and trucks delivering feedstock and

1 removing wastes and enriched uranium products from the proposed site during operation.  
2 Background noise levels at the proposed property boundary were provided by AES and  
3 documented in the ER (AES, 2010a). No independent measurements of background noise  
4 were conducted. Instead, NRC verified the appropriateness of the data collection instruments  
5 and methodology used by AES.  
6

7 NRC assigned typical noise signatures of construction vehicles and equipment in order to  
8 anticipate noise sources during preconstruction and construction. A standard noise attenuation  
9 rate of 6 dB per doubling of distance from the source was applied to each significant noise  
10 source that was presumed to be operating anywhere along the perimeter of the proposed EREF  
11 site (i.e., the industrial footprint of the proposed EREF) in order to estimate approximate noise  
12 levels at the nearest human receptor (beside the construction workforce).  
13

14 Noise estimates from operation were based on expected noise signatures of the various pieces  
15 of noise-producing equipment that would be operating in outside locations.  
16

17 The NRC staff has concluded from its noise assessments that, notwithstanding short-term noise  
18 impulse events such as blasting, adequate mitigation controls would ensure noise impacts  
19 during preconstruction, construction, and operation would all be below recommended standards  
20 at the closest human receptor; thus, noise impacts would be SMALL.  
21

#### 22 **4.2.8.1 Preconstruction and Construction**

23

24 Noise impacts would result from preconstruction and from construction activities. Specifically,  
25 noise would result from: the operation of various construction vehicles and equipment; the  
26 operation on area roads of vehicles used by the workforce to commute to and from the  
27 proposed site and delivery trucks bringing materials and equipment to the proposed site; the  
28 use of explosives (together with associated warning alarms), pile drivers, and/or backhoes to  
29 remove rock outcrops, install foundations, and bury utilities or facilitate cut and fill and grade  
30 alterations; travel of vehicles on onsite roads, loading, unloading, transferring, and stockpiling  
31 soils and materials; onsite support activities such as a concrete batch plant operation; and the  
32 operation of stationary sources such as the six emergency generators that would become  
33 operational while construction is still ongoing and, once installed, would be operated periodically  
34 throughout the construction period for the purpose of preventative maintenance. A similar  
35 preventative maintenance schedule would extend throughout the operation phase for each of  
36 the generators.  
37

38 Although a detailed preconstruction and construction plan has not yet been produced, AES has  
39 developed a comprehensive list of the number and types of vehicles that would be involved and  
40 identified the general parameters of their expected use (AES, 2010a). In addition to light-duty  
41 commuting and light-duty and heavy-duty delivery vehicles, AES has indicated that the following  
42 types of vehicles and equipment would be used: cranes, cherry pickers, water trucks, concrete  
43 delivery trucks, concrete pump trucks, stake body trucks, compressors, generators, and pumps  
44 (AES, 2010a).  
45

46 Noise would be generated at US 20 during construction of the site access roads and at their  
47 interconnection with US 20. Noise related to traffic on US 20 would increase due to traffic  
48 increases in delivery vehicles and commuting vehicles of the construction workforce.

1 Notwithstanding construction of the US 20 interchange, the majority of the construction activities  
2 would occur within the proposed EREF site (i.e., the industrial footprint of the proposed facility),  
3 which is located in the approximate center of the proposed EREF property, approximately  
4 3060 meters (10,039 feet) north of the US 20 interchange. AES estimates that noise from the  
5 operation of construction vehicles and equipment would range from 80 to 95 dBA at a distance  
6 of 15 meters (50 feet) from each source (AES, 2010a). Given that the majority of vehicles and  
7 equipment would be operating primarily within the industrial footprint (construction of the  
8 highway interchange and site access roads notwithstanding) and with the expectation that  
9 access to the active area would be limited to the authorized, fully informed, and adequately  
10 protected construction workforce, it is reasonable to expect that all potential public receptors  
11 would be at least no closer than 15 meters (50 feet) from high noise sources and, in most  
12 instances, at substantially greater distances from those sources. Members of the public  
13 traveling on US 20 would be close to high noise sources associated with construction of the  
14 interchange, but those individuals would be in vehicles and their exposures would be limited to a  
15 relatively short duration as their vehicle passed by the active construction zone. The noise level  
16 is expected to vary throughout the 10-hour workday with certain activities such as blasting  
17 creating short-term, high-intensity impulse noise that is likely to be higher than 95 dB at the  
18 source.

19  
20 According to the facility construction plan proposed by AES (AES, 2010a), most of the major  
21 noise-producing activities (site clearing and grading, excavations [including the use of  
22 explosives], utility burials, construction of onsite roads [including the US 20 interchanges], and  
23 construction of the ancillary buildings and structures) would occur during preconstruction.

24  
25 As discussed in Section 3.9, various noise standards have been promulgated at the Federal  
26 level that could serve as a basis for local ordinances. Although no specific noise ordinances  
27 have been adopted for the local area, the Federal standards of relevance in evaluating the  
28 acceptability of noise impacts from preconstruction and construction of the proposed EREF  
29 include:

- 30
- 31 • Day-night average noise levels,  $L_{dn}$ , less than 65 dBA are considered clearly acceptable for  
32 residential, livestock, and farming land uses;  $L_{dn}$  between 65 dBA and 75 dBA are normally  
33 unacceptable but could be made acceptable (to human receptors) with the application of  
34 noise attenuation features to occupied structures;  $L_{dn}$  above 75 dBA are always  
35 unacceptable for residential land uses, but  $L_{dn}$  between 70 and 80 dBA are acceptable for  
36 industrial and manufacturing areas (HUD, 2009).
  - 37  
38 • Day-night average noise levels,  $L_{dn}$ , less than 65 dBA are considered compatible with  
39 residential land uses; levels up to 75 dBA may be compatible with residential uses and  
40 transient lodging if structures have noise isolation features (EPA, 1980).
  - 41  
42 • Day-night average noise levels,  $L_{dn}$ , below 55 dBA are always acceptable (EPA's goal for  
43 outdoor spaces).
- 44

45 Noise attenuation with distance is dependent on a number of factors, including land type and  
46 cover, topography, the presence of natural or man-made obstructions, and meteorological  
47 conditions such as wind speed and direction, temperature inversions, and cloud cover. The  
48 widely accepted rate of noise attenuation is a reduction of 6 dBA for every doubling of distance.



1 However, this rate represents a fully vegetated land surface. In arid or semiarid locations where  
2 vegetative cover is less than complete and surface soils tend to be highly sound-reflective,  
3 lesser amounts of attenuation can be expected. However, despite its characterization as a  
4 semiarid steppe, the proposed EREF site has a relatively complete vegetative cover,  
5 notwithstanding the volcanic rock outcroppings that constitute approximately 28 percent of the  
6 land area (see Section 3.6 for additional details). It is therefore reasonable to expect that noise  
7 attenuation would occur at or near the average of 6 dBA with every doubling of distance from  
8 the source.<sup>10</sup>

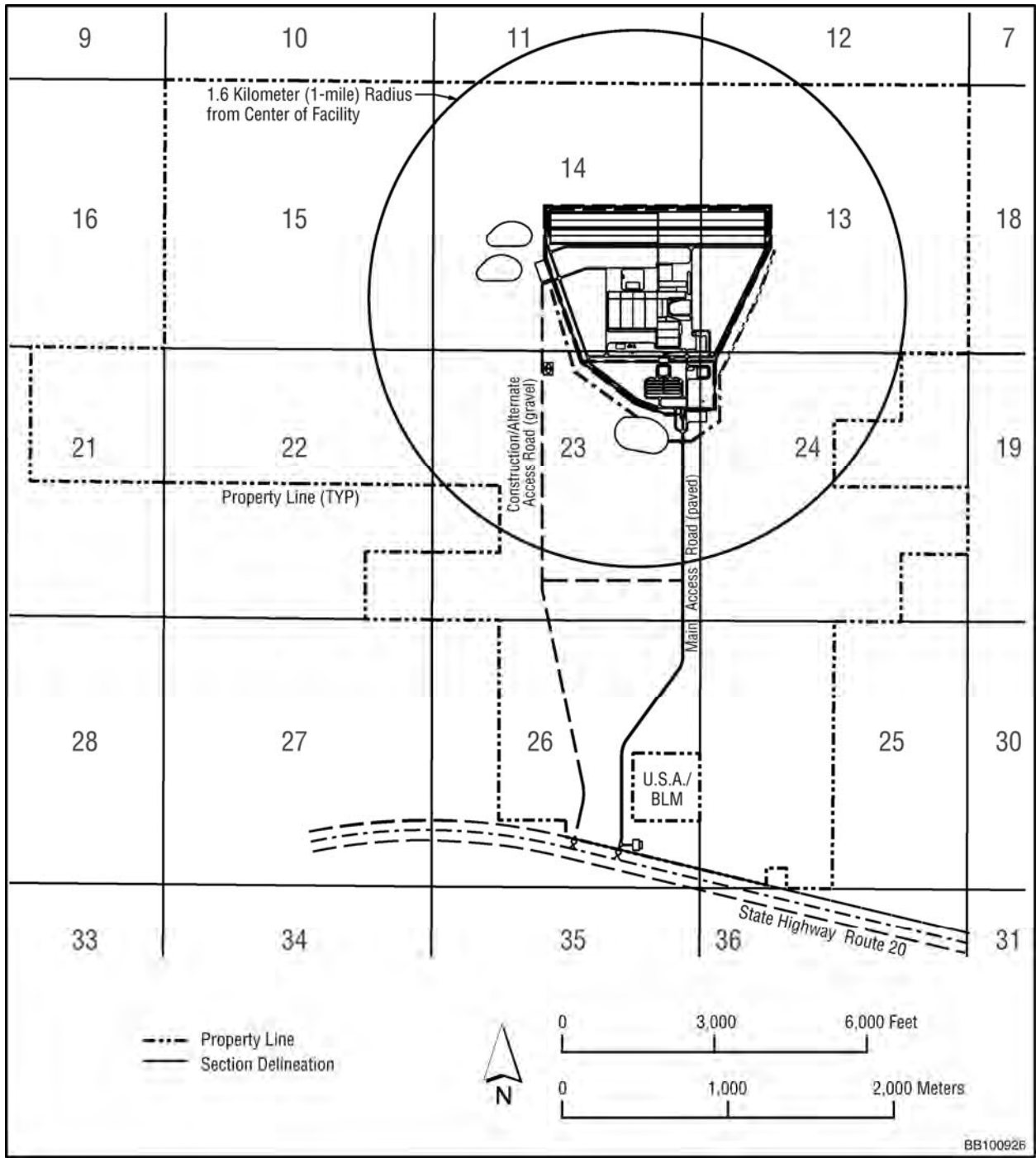
9  
10 Figure 4-5 shows the site plan for the proposed EREF site, the access roads, US 20  
11 interchange, and the visitor center. The proposed EREF property boundary closest to the  
12 industrial footprint is to the north at a distance of approximately 762 meters (2500 feet). The  
13 industrial footprint is approximately 3060 meters (10,039 feet) north of US 20. Except as noted  
14 below, adjacent land parcels are expected to continue to be used for livestock grazing and  
15 agricultural activities. The nearest residence to the proposed site was identified by AES as  
16 being 7.7 kilometers (4.8 miles) east of the proposed site. No other sensitive human receptors  
17 (schools, churches, hospitals) are closer. The Wasden Complex, an archeological site, is  
18 approximately 1.0 kilometer (0.6 mile) outside the proposed EREF property boundary. The  
19 Wasden Complex contains no brick-and-mortar or masonry structures and, at its distance from  
20 the proposed site, would not experience any potentially destructive sound pressure levels.  
21 (See Section 4.2.7 for a more detailed discussion of ecological impacts from noise related to  
22 preconstruction, construction, and operation.)

23  
24 Assuming a noise level of 95 dBA at the perimeter of the proposed EREF site (potentially  
25 occurring during preconstruction activities), applying an attenuation rate of 6 dBA per distance  
26 doubling, and considering the distances from the active construction zone to facility boundaries,  
27 noise levels of 61 dBA are estimated to occur at the north boundary of the proposed EREF  
28 property. Assuming the maximum noise levels from site access road construction to also be  
29 95 dBA, an attenuation rate of 6 dBA per doubling of distance, and considering that access  
30 roads approach the west facility boundary of the proposed EREF property as close as  
31 37 meters (120 feet), noise levels at that boundary are estimated to be as high as 89 dBA.  
32 Although this anticipated level exceeds suggested acceptable limits, construction activities for  
33 the road in proximity to the west boundary of the proposed EREF property would be short-term,  
34 and the immediately adjacent offsite land parcel is expected to be used for either livestock  
35 grazing or agriculture and to not have a human presence during the majority of time the  
36 preconstruction activities are occurring.

37  
38 At their closest point, one access road, the highway interchange, and the visitor center are  
39 immediately adjacent to BLM's Hell's Half Acre WSA located to the south. However, individuals  
40 visiting Hell's Half Acre are expected to be no closer than the start of the hiking trail, another  
41 0.5 kilometer (0.3 mile) farther to the south. At the start of the hiking trail, attenuated  
42 construction noise is estimated to be between 51 and 66 dBA. Although construction noise  
43 would be audible at the hiking trail, the initial preconstruction and construction activities that  
44 represent the highest potential noise emissions would be short-term (for intermittent periods

---

<sup>10</sup> Some slight seasonal variation in noise attenuation is anticipated due to the presence or absence of vegetative cover or snow cover. No quantitative estimates were made, however, since it is difficult to anticipate the manner in which adjacent land parcels would be used from year to year.



1  
2  
3  
4

Figure 4-5 Proposed EREF Site Plan (AES, 2010a)

1 over the 12 month construction period for the highway interchanges) and associated noise  
2 would combine with highway noise already occurring in that area, measured and documented  
3 by AES in the AES ER at 57 dBA (AES, 2010a).

4  
5 Available data suggest that construction noise during preconstruction would be audible at some  
6 boundaries of the proposed EREF property. Construction noise emanating from activities within  
7 the industrial footprint is expected to be attenuated to acceptable levels at the boundaries of the  
8 proposed EREF property. Noise resulting from highway interchange, site access road, and  
9 visitor center construction may occur at offsite locations at levels above values suggested in  
10 Federal standards as acceptable, albeit for relatively short periods of time throughout  
11 construction of the US 20 interchanges (estimated by AES as 12 months or less). However,  
12 with the exception of individuals using the Hell's Half Acre hiking trail or traveling on US 20  
13 (at highway speeds), the potentially impacted offsite areas are all used for livestock grazing  
14 and/or agricultural purposes and would typically not have a human presence. No residence is  
15 expected to experience unacceptable levels of noise during any phase of preconstruction and  
16 construction.

17  
18 The NRC staff concludes that noise impacts from initial preconstruction activities may exceed  
19 established standards at some locations along the proposed EREF property boundary for  
20 relatively short periods of time. However, because of the distances involved, expected levels of  
21 attenuation, the application of mitigation measures, and the expected limited presence of human  
22 receptors at these locations, the impacts would be SMALL for human receptors. During the  
23 4-year overlap period when partial operations begin as heavy construction is completed, noise  
24 impacts from remaining construction activities and from operation are expected to be additive,  
25 but nevertheless substantially reduced from noise levels during preconstruction and  
26 construction would be SMALL.

#### 27 28 **4.2.8.2 Facility Operation**

29  
30 Current development plans provide for a period of approximately 4 years when the proposed  
31 facility becomes partially operational while some structure construction is still ongoing within the  
32 industrial footprint. However, the majority of the largest noise emissions are expected to occur  
33 during preconstruction. Those activities would all have been completed throughout the  
34 proposed site before any operations begin, with ongoing construction confined to a small area  
35 and not involving major noise-producing equipment or activities. The combined noise impacts  
36 from simultaneous remaining construction and partial operation would be dominated by the  
37 higher noise source but nevertheless is expected to be diminished from impacts during initial  
38 preconstruction and construction.

39  
40 Major noise sources associated with operation of the proposed EREF include the six diesel-  
41 fueled emergency generators located at outdoor areas within the industrial footprint, commuter  
42 traffic noise for the operational workforce (and a small construction workforce for the 4-year  
43 period of heavy construction and operation overlap), traffic noise from the movement of delivery  
44 vehicles to bring feedstock materials and other support materials to the proposed site and  
45 remove product and waste materials from the proposed site, noise from operation of various  
46 pumps and compressors, and cooling fan noise. Numerous pieces of equipment associated  
47 with operation can be expected to have noise signatures. However, with the exception of  
48 emergency generators, cooling fans, and large compressors, the majority of noise-producing

1 equipment would be located inside buildings and their noise sources would be significantly  
2 attenuated by those structures.<sup>11</sup> Some of the outdoor equipment with significant noise  
3 signatures are expected to be located within noise-suppressing enclosures.

4  
5 AES referenced noise measurements from the Almelo Enrichment Plant in Almelo, The  
6 Netherlands, a facility also using the same gas centrifuge design as the proposed EREF, as  
7 ranging from 30 to 47 dBA at the facility boundary (AES 2010a). Because the Almelo Facility's  
8 design does not include a substantial fallow buffer area between industrial activities and the  
9 facility's boundary, AES has characterized the Almelo-measured operational noise levels as  
10 conservative representations of the proposed EREF operational noise levels (as measured at  
11 the proposed EREF property boundary) and concluded they satisfy all relevant or potentially  
12 relevant U.S. noise standards and guidance. NRC concurs that same noise levels that would  
13 occur at the proposed EREF would comply with relevant U.S. noise standards and guidance.

14  
15 Traffic associated with operations at the proposed EREF would result in increased noise levels  
16 along US 20 in the vicinity of the proposed EREF, contributing to traffic-related noise that  
17 already exists in proximity to the highway, especially during expected periods of commuting of  
18 INL personnel from Idaho Falls. Residents in the vicinity of US 20, but otherwise unaffected by  
19 operational noise emanating from the proposed EREF site, would be impacted by increased  
20 traffic noise. Traffic noise can be expected to increase slightly and, depending on the  
21 operational schedules established for the proposed EREF, the duration of traffic noise may  
22 increase over the course of a workday.

23  
24 The NRC staff concludes that distances from noise sources to sensitive receptors would result  
25 in adequate control of noise sources related to operation of the proposed EREF, and noise  
26 impacts from operation of the proposed EREF would be SMALL.

#### 27 28 **4.2.8.3 Mitigation Measures**

29  
30 The most effective strategy for mitigating noise impacts to the general public involves  
31 maximizing the distance between noise sources and potential public receptors. The size of the  
32 proposed EREF property, the positioning of the proposed EREF site within that property, the  
33 design of the proposed EREF site, and site access controls would guarantee such separations  
34 during preconstruction, construction, and operating periods. In addition to the intrinsic controls  
35 of the proposed EREF property and the placement of the proposed EREF site within that  
36 property, AES identified the following noise mitigation strategies for preconstruction and  
37 construction (AES, 2010a):

- 38  
39 • restricting most of US 20 use after twilight through early morning hours to minimize noise  
40 impacts to the nearest residence; restrict usage of heavy truck and earthmoving equipment  
41 after twilight through early morning hours during construction of the access roads and

---

<sup>11</sup> The gas centrifuges operate at extremely high speeds. However, because they are supported magnetically and operate under high vacuum, their operation is expected to be extremely quiet. Catastrophic failure of a centrifuge may create a high impulsive noise. Their design, together with their locations inside buildings, suggest that the centrifuges would not contribute significantly to the operational noise signature of the proposed EREF that would be experienced at the proposed EREF property boundary.

1 highway entrances, to minimize noise impacts on the Hell's Half Acre Wilderness Study  
2 Area

- 3
- 4 • performing construction or decommissioning activities with the potential for noise or vibration
- 5 at residential areas that could have a negative impact on the quality of life, during the
- 6 daytime hours (7:00 am–7:00 pm); if it is necessary to perform an activity that could result in
- 7 excessive noise or vibration in a residential area after hours, AES would notify the
- 8 community in accordance with site procedures
- 9
- 10 • using engineered and administrative controls for equipment noise abatement, including the
- 11 use of equipment and vehicle mufflers, acoustic baffles, shrouding, barriers, and noise
- 12 blankets
- 13
- 14 • sequencing construction or decommissioning activities to minimize the overall noise and
- 15 vibration impact (e.g., establish the activities that can occur simultaneously or in succession)
- 16
- 17 • using blast mats, if necessary, when using explosives
- 18
- 19 • creating procedures for notifying State and local government agencies, residents, and
- 20 businesses of construction or decommissioning activities that may produce high noise or
- 21 vibration that could affect them
- 22
- 23 • posting appropriate State highway signs warning of blasting
- 24
- 25 • creating a Complaint Response Protocol for dealing with and responding to noise or
- 26 vibration complaints, including entering the complaint into the site's Corrective Action
- 27 Program
- 28
- 29 • establishing and enforcing onsite speed limits
- 30

31 The NRC identified the following additional noise mitigation measure for preconstruction and  
32 construction:

- 33
- 34 • suspend the use of explosives during periods when meteorological conditions (e.g., low
- 35 cloud cover) can be expected to reduce sound attenuation
- 36

37 AES has identified the following mitigative actions to control noise impacts during operation of  
38 the proposed EREF (AES, 2010a):

- 39
- 40 • mitigating operational noise sources primarily by plant design, whereby cooling systems,
- 41 valves, transformers, pumps, generators, and other facility equipment are located mostly
- 42 within plant structures and the buildings absorb the majority of the noise located within
- 43
- 44 • restricting most of US 20 use after twilight through early morning hours to minimize noise
- 45 impacts to the nearest residence
- 46
- 47 • establishing preventative maintenance programs that ensure all equipment is working at
- 48 peak performance (AES, 2009b)
- 49



1 **4.2.9 Transportation Impacts**  
2

3 This section discusses the potential impacts from transportation to and from the proposed EREF  
4 site. Transportation impacts resulting from the movement of personnel and material during  
5 preconstruction, construction, and operation of the proposed EREF include:  
6

- 7 • transportation of construction materials and construction debris
- 8
- 9 • transportation of the construction workforce
- 10
- 11 • transportation of the operational workforce
- 12
- 13 • transportation of feed material (including natural UF<sub>6</sub> [i.e., not enriched], empty tails  
14 cylinders, and supplies for the enrichment process)
- 15
- 16 • transportation of the enriched UF<sub>6</sub> product (and empty product cylinders)
- 17
- 18 • transportation of process wastes, including depleted UF<sub>6</sub> and other radioactive wastes  
19

20 The primary impact of preconstruction and the proposed action on transportation resources is  
21 expected to be increased traffic on nearby roads and highways. Transportation impacts during  
22 preconstruction and construction, and during facility operation would be SMALL to MODERATE  
23 on adjacent local roads (due to the potentially significant increase in average daily traffic), but  
24 regional impacts would be SMALL.  
25

26 No fatalities are expected as a result of construction worker traffic to and from the proposed  
27 EREF site during each of the peak years of construction. Measures proposed by AES to  
28 mitigate potential traffic impacts at the entrance to the proposed EREF include encouraging  
29 carpooling, varying shift change times, and incorporating traffic safety measures to improve  
30 traffic flow on US 20 (AES, 2010a).  
31

32 No construction or operational worker fatalities are expected from traffic accidents. Less than  
33 two latent fatalities are expected from truck emissions on an annual basis. Less than two latent  
34 cancer fatalities (LCFs) to either the general public or occupational workers are expected from  
35 incident-free transport of radioactive materials. No fatalities to the general public resulting from  
36 truck accidents are anticipated. The potential health impacts from the transportation of  
37 radioactive materials and from chemical exposures resulting from a transportation accident  
38 would be SMALL.  
39

40 **4.2.9.1 Preconstruction and Construction**  
41

42 Preconstruction and construction activities for the proposed EREF would cause an impact on  
43 the local transportation network due to the construction of the highway entrance(s), the daily  
44 commute of up to 590 construction workers during the peak years of construction, and daily  
45 construction deliveries and waste shipments (AES, 2010a). The commute of the peak number  
46 of construction workers, combined with the anticipated number of construction deliveries and  
47 waste shipments, could increase the daily traffic on US 20 from 2210 vehicle trips per day  
48 (see Table 3-23 in Chapter 3) to 3420 vehicle trips per day (2210 plus 590 commuting round

1 trips and 15 delivery/waste round trips). This represents a 55 percent increase in traffic volume  
2 over current levels. Based on employment and delivery/shipment projections for the proposed  
3 facility, this estimate also represents the maximum number of vehicle-trips during the period  
4 when construction and operations overlap (AES, 2009b) (see Section 4.2.9.2).

5  
6 Because traffic volume is expected to remain below capacity on Interstate 15 (I-15) and traffic  
7 slowdowns or delays would only be expected to occur at the entrance to the proposed EREF  
8 during shift changes, the impacts on overall traffic patterns and volumes would be MODERATE  
9 on US 20 and SMALL on I-15.

10  
11 In addition to the increased traffic that might result from the construction of the site entrance(s)  
12 along US 20, there would be an increased potential for traffic accidents. Assuming an  
13 80-kilometer (50-mile) round-trip commute (i.e., the round-trip distance between the Idaho Falls  
14 area and the proposed EREF) for 250 workdays per year, 590 vehicles would travel an  
15 estimated total of 11,800,000 vehicle kilometers (7,375,000 vehicle miles) per year. This  
16 average round-trip distance was assumed because Idaho Falls is the closest principal business  
17 center to the proposed EREF. Based on the statewide vehicle accident and fatality rates of  
18 85.8 injuries and 1.59 fatalities per 100 million annual vehicle miles (ITD, 2009), seven injuries  
19 and no fatalities (risk of <0.12 fatalities estimated) would be expected to occur during a peak  
20 preconstruction/construction employment year. Therefore, the impacts from construction  
21 vehicle accidents would be SMALL.

22  
23 An average of 3940 delivery and waste trucks would arrive and depart the proposed site in each  
24 of the three peak years of construction (about 16 trucks per day) (AES, 2010a). Assuming an  
25 average round-trip distance of 80 kilometers (50 miles), construction-related trucks would travel  
26 an estimated 315,200 vehicle kilometers (197,000 vehicle miles) per year. Based on State-level  
27 surface freight accident rates of 63.4 injuries and 40.1 fatalities per 100 million annual truck  
28 miles (Saricks and Tompkins, 1999), no injuries (risk of <0.13 injuries) and no fatalities (risk of  
29 <0.08 fatalities) from construction delivery and waste shipments would be expected to occur  
30 during peak preconstruction/construction. The impacts from the truck traffic to and from the  
31 proposed site during preconstruction and construction would have a SMALL impact on overall  
32 traffic.

33  
34 In addition to the potential for injuries and fatalities from construction shipments, there are  
35 potential impacts from truck emissions. Based on a conservative (Class VIIIIB) emission rate  
36 (Biwer and Butler, 1999), no latent fatalities would be expected from truck emissions during a  
37 peak year of construction (risk of <0.17 latent fatalities). Therefore, pollution impacts from  
38 construction vehicle traffic would be SMALL.

39  
40 Two access roadways into the proposed EREF site are planned to support access during  
41 preconstruction, construction, and facility operation (AES, 2010a).<sup>12</sup> The main (eastern) access  
42 road would run north from US 20 to the southern entrance of the proposed EREF site. The  
43 construction/alternate (western) access road would run north from US 20 to the western  
44 entrance of the proposed EREF site. One or both roadways would eventually be converted to

---

<sup>12</sup> Plans for permanent access to US 20, including the number of full-time operational connections, have not been finalized. As of August 2010, AES continues to consult with ITD. The impacts described in this EIS are not expected to be sensitive to the number or placement of access roads.

1 permanent access roads upon completion of construction. The Idaho Transportation  
2 Department (ITD) would require AES to secure and maintain a permit for access to the  
3 proposed EREF site (NRC, 2009b).

4  
5 AES has initiated discussions with ITD regarding the construction of the site access roads from  
6 US 20 and related safety requirements. For the main (eastern) access road, AES has  
7 expressed little interest in at-grade turn lanes (which would not solve difficulties associated with  
8 left turns to and from the main site access road) or a loop road similar to that used by INL  
9 (which would not solve difficulties associated with the high-speed merge into peak traffic that  
10 includes few gaps) (ITD, 2010). Instead, AES has indicated a preference for a grade-separated  
11 interchange (ITD, 2010). The proposed EREF site is favorable for construction of an overpass  
12 due to existing physical features, peak directional flow to/from INL, and low traffic volumes at all  
13 other times (ITD, 2010). Ramp construction would likely require 3 to 4 months and would  
14 present a minor impact on current traffic flow (due to the mandatory construction zone speed  
15 reduction to 72 kilometers per hour [45 miles per hour]); overpass construction would result in  
16 some traffic flow disruption, but it is not expected to be significant (ITD, 2010). US 20 appears  
17 to have the available capacity to absorb additional traffic created by construction and operations  
18 related to the proposed EREF without adverse effects, with the possible exception of peak,  
19 directional travel periods (i.e., rush hour) in the morning and afternoon. Impacts on US 20 peak  
20 flow could be minimized by ceasing construction activities during peak directional flow  
21 (see Section 3.12.1) (ITD, 2010). Impacts on US 20 traffic flow due to construction of site  
22 access roads would be SMALL and temporary, occurring only during the period of access road  
23 construction.

24  
25 As noted above, there is currently no road or parking infrastructure at the proposed EREF site.  
26 Therefore, site-specific traffic levels (e.g., during construction and shift changes) are based on  
27 maximum projections of construction traffic, regular operational workforce, incoming deliveries,  
28 and outgoing shipments. Peak traffic flows are anticipated at shift changes, with the principal  
29 problem area occurring where the site access roads meet US 20. The proposed EREF site is  
30 assumed to have enough parking capacity to accommodate each working shift and any  
31 necessary visitors (AES, 2010a).

32  
33 Overall, the anticipated transportation impacts from preconstruction and construction, as well as  
34 the period when construction activities and operation overlap, would be SMALL to MODERATE.  
35 Assuming AES estimates for the first year of construction are representative of preconstruction  
36 (AES, 2010a), and assuming eight months of preconstruction, the estimated relative  
37 contributions to these impacts are 10 percent during preconstruction and 90 percent during  
38 construction.

#### 39 40 **4.2.9.2 Facility Operation**

41  
42 Operations impacts could occur from the transport of personnel, nonradiological materials, and  
43 radioactive material to and from the proposed EREF site, with the highest impacts occurring  
44 during the period when facility construction and operation overlap. The impacts from each are  
45 discussed below.

1 **Transportation of Personnel**  
2

3 Operations at the proposed EREF would be continuous, requiring an operational workforce of  
4 550 workers, approximately 4.2 employees to staff each position, three shifts per day (seven  
5 days per week), and an average of 130 positions per shift (AES, 2010a). Based on a  
6 conservative commuting density of one employee per vehicle, the average increase in daily  
7 local traffic (on US 20) due to employee commuting is estimated to be 35 percent (2210 plus  
8 780 employee vehicle trips). Assuming a round-trip distance of 80 kilometers (50 miles) and  
9 statewide vehicle accident rates, employees would travel approximately 11,388,000 vehicle  
10 kilometers (7,117,500 vehicle miles) per year of facility operation. Based on statewide vehicle  
11 accident and fatality rates (ITD, 2009), seven injuries and no fatalities (risk of <0.12 fatalities)  
12 would be anticipated from traffic accidents during a peak year of operation.  
13

14 As noted in Section 4.2.9.1, the maximum number of daily vehicle-trips during the period when  
15 construction and operations overlap is projected to be 590 commuting round trips (1180 vehicle-  
16 trips) and 15 delivery/waste round trips (30 vehicle-trips). This projection bounds the 780 daily  
17 vehicle-trips that are anticipated during peak operation, and the associated level of increased  
18 traffic would have a SMALL to MODERATE impact on the current traffic on US 20 (SMALL for  
19 an off-peak shift change).  
20

21 **Transportation of Nonradiological Materials**  
22

23 The transportation of nonradiological materials would include the delivery of routine supplies  
24 and equipment necessary to sustain operation and the removal of nonradiological wastes  
25 (including hazardous wastes). The transportation of hazardous waste is subject to EPA and  
26 U.S. Department of Transportation (DOT) regulations. Nonradiological deliveries and waste  
27 removal would require an estimated 3889 truck round-trips per year (including eight shipments  
28 of hazardous waste per year) (AES, 2010a), or approximately 16 round-trips per day. This  
29 traffic would have a SMALL impact on the current traffic on US 20. Assuming a round-trip  
30 distance of 80 kilometers (50 miles), these trucks would travel approximately 311,120 kilometers  
31 (194,450 miles) per year of operation, no injuries (risk <0.13), and no fatalities (risk <0.8) would  
32 be expected per year of peak operation. Therefore, the impacts from accidents involving the  
33 shipment of nonradiological materials would be SMALL. The 80-kilometer (50-mile) distance is  
34 reflective of the round-trip distance between the proposed EREF site and the Idaho Falls area.  
35 Peterson Hill Landfill, the proposed destination for most of the nonhazardous and  
36 nonradioactive waste generated by the proposed EREF, is located near Idaho Falls. Hazardous  
37 wastes would be shipped to a local or regional Resource Conservation and Recovery Act  
38 (RCRA)-permitted treatment, storage, and disposal facility (TSDF), such as the U.S. Ecology  
39 facility near Grandview, Idaho (approximately 121 kilometers [75 miles] from the proposed  
40 EREF site).  
41

42 **Transportation of Radiological Materials**  
43

44 Transportation of radiological materials would include shipments of feed material (natural UF<sub>6</sub>),  
45 product material (enriched UF<sub>6</sub>), depleted tails (depleted UF<sub>6</sub>) and other radioactive wastes, and  
46 empty feed, tails, and product cylinders. Due to the lack of rail access in the region, AES did  
47 not propose rail transportation as a future means of shipping radioactive material and wastes

1 (AES, 2010a). AES has proposed trucking as the sole mode of freight transportation to and  
2 from the proposed EREF.

3  
4 Transportation of radiological materials is subject to NRC and DOT regulations. All materials  
5 shipped to or from the proposed EREF could be shipped in Type A containers. The product  
6 (enriched UF<sub>6</sub>) is considered by the NRC to be fissile material and would require additional  
7 fissile packaging considerations such as using an overpack surrounding shipping containers.  
8 However, when impacts are evaluated, the effects of the overpack are not incorporated into the  
9 assessment and result in a set of conservative assumptions.

10  
11 The potential impacts from radiological shipments, other than the traffic increase on local roads,  
12 were analyzed using the WebTRAGIS and RADTRAN computer codes. WebTRAGIS (Johnson  
13 and Michelhaugh, 2003) is a Web-based version of the Transportation Routing Analysis  
14 Geographic Information System (TRAGIS), which is used to model highway, rail, and waterway  
15 routes within the United States. RADTRAN 5 (Weiner et al., 2008) is used to calculate the  
16 potential impacts of radiological shipments using the routing information generated by  
17 WebTRAGIS. Appendix D presents details of the methodology, calculations, and results of  
18 these analyses.

19  
20 RADTRAN 5.6 estimates several different types of transportation impacts. "Incident-free"  
21 impacts are those not involving any release of radioactive material, including health impacts  
22 from traffic accidents (fatalities) and due to radiation exposure from a passing radiological  
23 shipment (latent cancer fatalities [LCFs]). These impacts are estimated based on one year of  
24 shipments and are presented for both the general public near the transportation routes and the  
25 maximally exposed individual (MEI).<sup>13</sup> Risks are calculated based on a population density  
26 located within 800 meters (0.5 mile) of the transportation route. In addition to incident-free  
27 impacts, RADTRAN presents impacts and resultant risks (impact multiplied by probability of  
28 occurrence) from a range of accidents severe enough to release radioactive material to the  
29 environment. It was conservatively assumed that once a container is breached, the material  
30 that is released is completely aerosolized and respirable (see Section D.3.4.2).

31  
32 Health effects from vehicle exhaust emissions (latent fatalities) are also considered to be an  
33 incident-free impact. These impacts are estimated using the methodology discussed in  
34 Appendix D.

### 35 36 Radiological Shipments by Truck

37  
38 Impacts discussed in this section include the traffic impacts from EREF-related truck traffic as  
39 well as the radiation exposure from the radiological shipments involving UF<sub>6</sub>, enriched product,  
40 depleted UF<sub>6</sub>, and other low-level radioactive wastes, and empty shipping containers.

41  
42 The NRC staff evaluated the number of shipments of each type of material based on the  
43 amount and type of material being transported to and from the proposed EREF:  
44

---

<sup>13</sup> A maximally exposed individual (MEI) is a member of the general public that would be expected to receive the highest potential radiological dose for a given scenario.



- 1 • Feed material (natural UF<sub>6</sub>) would be shipped to the proposed EREF site in Type 48Y  
2 cylinders (up to 1424 per year) primarily from UF<sub>6</sub> conversion facilities near Metropolis,  
3 Illinois, or Port Hope, Ontario, Canada (AES, 2010a). Feed material could also be received  
4 from international sources, via major international shipping ports on the East Coast  
5 (Portsmouth, Virginia, or Baltimore, Maryland). There would be one 48Y cylinder per truck,  
6 resulting in approximately six shipments per day (assuming 250 shipping days per year).  
7
- 8 • Enriched UF<sub>6</sub> product would be shipped in Type 30B cylinders (up to 1032 per year) to any  
9 of three domestic fuel manufacturing plants (located in Richland, Washington; Wilmington,  
10 North Carolina; or Columbia, South Carolina) or to international destinations via the two  
11 international shipping ports (Portsmouth, Virginia, or Baltimore, Maryland). Up to five  
12 Type 30B cylinders could be shipped on one truck; however, AES proposes to ship only two  
13 cylinders per truck (AES, 2010a). Therefore, 516 truck shipments per year (approximately  
14 two per day) would leave the proposed site.  
15
- 16 • The impacts of transporting depleted UF<sub>6</sub> to a conversion facility in preparation for eventual  
17 disposal were also analyzed. Conversion could be performed at a DOE facility or a private  
18 facility (see Section 2.1.5), although AES has not indicated any plans to use a private  
19 facility. DOE conversion facilities are currently being constructed at Paducah, Kentucky,  
20 and Portsmouth, Ohio, and the NRC is currently reviewing a license application for a private  
21 conversion facility (International Isotopes, Inc.) (NRC, 2010d). Depleted UF<sub>6</sub> would be  
22 placed in Type 48Y cylinders for temporary storage at the proposed EREF site and eventual  
23 shipment offsite. Approximately 1222 truck shipments per peak year (one cylinder per truck)  
24 would be required to transport the depleted UF<sub>6</sub> to a conversion facility where the waste  
25 would be converted into U<sub>3</sub>O<sub>8</sub>. If DOE performs the conversion at the Paducah or  
26 Portsmouth facilities, the resulting U<sub>3</sub>O<sub>8</sub> could be shipped offsite for disposal.  
27
- 28 • In addition to full feed, product, and depleted UF<sub>6</sub> shipments, 1424 empty feed, 1032 empty  
29 product, and 1222 empty depleted UF<sub>6</sub> cylinders on an average annual basis would be  
30 shipped to or from the proposed EREF. Assuming two cylinders per truck for all shipments  
31 (AES, 2010a), 1839 truck shipments would be required per year (about 7 to 8 per day,  
32 assuming 250 shipping days per year).  
33
- 34 • Other radiological waste of approximately 146,500 kilograms (323,000 pounds) per year  
35 would be shipped offsite to EnergySolutions (in Oak Ridge, Tennessee) for processing or to  
36 EnergySolutions (near Clive, Utah) or U.S. Ecology (in Hanford, Washington) for disposal  
37 (AES, 2010a). These shipments would total approximately 16 truck shipments per year.  
38 The distance to the Oak Ridge disposal site, which is the furthest of the two disposal sites  
39 from the proposed EREF, adequately encompasses the range of radiological waste disposal  
40 sites that could be available in the future.  
41

42 Based on the discussion above, the total number of trucks containing radiological shipments  
43 (i.e., both incoming and outgoing material) would be about 20 per day (5017 total shipments  
44 over 250 shipping days per year), which would have a minimal impact on US 20 traffic in the  
45 vicinity of the proposed EREF site.  
46

### **Latent Cancer Fatality from Exposure to Ionizing Radiation**

*A latent cancer fatality (LCF) is a death from cancer resulting from, and occurring an appreciable time after, exposure to ionizing radiation. Death from cancer induced by exposure to radiation may occur at any time after the exposure takes place. However, latent cancers would be expected to occur in a population from 1 year to many years after the exposure takes place. To place the significance of these additional LCF risks from exposure to radiation into context, the average individual has approximately 1 chance in 4 of dying from cancer (LCF risk of 0.25).*

*The EPA has suggested a conversion factor such that for every 100 person-sieverts (10,000 person-rem) of collective dose, approximately 6 individuals would ultimately develop a radiologically induced cancer (Eckerman et al., 1999). If this conversion factor is multiplied by the individual dose, the result is the individual increased lifetime probability of developing an LCF. For example, if an individual receives a dose of 0.00033 sieverts (0.033 rem), that individual's LCF risk over a lifetime is estimated to be  $2 \times 10^{-5}$ . This risk corresponds to a 1 in 50,000 chance of developing a LCF during that individual's lifetime. If the conversion factor is multiplied by the collective (population) dose, the result is the number of excess latent cancer fatalities.*

*Because these results are statistical estimates, values for expected latent cancer fatalities can be, and often are, less than 1.0 for cases involving low doses or small population groups. If a population group collectively receives a dose of 50 sieverts (5000 rem), which would be expressed as a collective dose of 50 person-sieverts (5000 person-rem), the number of potential latent cancer fatalities experienced from within the exposure group is 3. If the number of latent cancer fatalities estimated is less than 0.5, on average, no latent cancer fatalities would be expected.*

*Source: NRC, 2004, 2005.*

1  
2  
3 Table 4-12 presents a summary of the potential health impacts to the public and transportation  
4 crews for one year of shipments via truck, calculated using RADTRAN 5. The results are  
5 presented in terms of a range of values for each type of shipment. The range represents the  
6 lowest to highest impacts for the various proposed shipping routes. For example, for feed  
7 material, the range of impact values represents one year of shipments from any of the four  
8 locations where feed material shipments could originate. If feed materials were provided from  
9 one or more of the locations, the impacts would be somewhere between the low and high  
10 values (impacts could be evaluated by summing the products of the fraction of material from  
11 each location and the calculated impacts from those locations). Also included in the table are  
12 the range of impacts summed over shipments of the feed, product, depleted uranium, and  
13 waste.  
14

**Table 4-12 Summary of Annual Impacts on Humans from Truck Transportation of Radioactive Material<sup>a</sup>**

Material	Range	Incident-Free LCF			Accident	
		Latent Emissions Fatalities	Public Radiation LCF	Crew Radiation LCF	Physical Fatalities	LCF <sup>b</sup>
Feed	High	$6.1 \times 10^{-1}$	$1.9 \times 10^{-1}$	$1.1 \times 10^{-2}$	$8.2 \times 10^{-2}$	$6.6 \times 10^{-3}$
	Low	$3.5 \times 10^{-1}$	$9.6 \times 10^{-2}$	$7.2 \times 10^{-3}$	$5.7 \times 10^{-2}$	$4.8 \times 10^{-3}$
Product	High	$2.4 \times 10^{-1}$	$8.4 \times 10^{-2}$	$3.1 \times 10^{-3}$	$3.0 \times 10^{-2}$	$5.9 \times 10^{-3}$
	Low	$3.9 \times 10^{-2}$	$1.3 \times 10^{-2}$	$6.6 \times 10^{-4}$	$7.3 \times 10^{-3}$	$8.4 \times 10^{-4}$
Depleted UF <sub>6</sub> /tails	High	$3.5 \times 10^{-1}$	$1.1 \times 10^{-1}$	$7.8 \times 10^{-3}$	$5.9 \times 10^{-2}$	$4.4 \times 10^{-3}$
	Low	$3.1 \times 10^{-1}$	$9.6 \times 10^{-2}$	$6.0 \times 10^{-3}$	$5.0 \times 10^{-2}$	$3.2 \times 10^{-3}$
Empty feed	High	$3.0 \times 10^{-1}$	$2.7 \times 10^{-1}$	$1.6 \times 10^{-2}$	$4.1 \times 10^{-2}$	$2.5 \times 10^{-8}$
	Low	$1.8 \times 10^{-1}$	$1.6 \times 10^{-1}$	$1.1 \times 10^{-2}$	$2.9 \times 10^{-2}$	$1.6 \times 10^{-8}$
Empty product	High	$2.4 \times 10^{-1}$	$3.2 \times 10^{-1}$	$1.5 \times 10^{-2}$	$3.0 \times 10^{-2}$	$1.2 \times 10^{-8}$
	Low	$3.9 \times 10^{-2}$	$6.6 \times 10^{-2}$	$3.3 \times 10^{-3}$	$7.3 \times 10^{-3}$	$1.7 \times 10^{-9}$
Empty depleted UF <sub>6</sub> /tails	High	$2.6 \times 10^{-1}$	$2.3 \times 10^{-1}$	$1.4 \times 10^{-2}$	$3.5 \times 10^{-2}$	$2.5 \times 10^{-8}$
	Low	$1.5 \times 10^{-1}$	$1.3 \times 10^{-1}$	$9.0 \times 10^{-3}$	$2.5 \times 10^{-2}$	$1.0 \times 10^{-8}$
Waste	High	$5.0 \times 10^{-3}$	$1.4 \times 10^{-3}$	$1.9 \times 10^{-4}$	$7.6 \times 10^{-4}$	$1.3 \times 10^{-6}$
	Low	$1.2 \times 10^{-3}$	$2.6 \times 10^{-4}$	$3.0 \times 10^{-5}$	$1.1 \times 10^{-4}$	$2.5 \times 10^{-7}$
Total	High	2.0	1.2	$6.7 \times 10^{-2}$	$2.8 \times 10^{-1}$	$1.7 \times 10^{-2}$
	Low	1.1	$5.6 \times 10^{-1}$	$3.7 \times 10^{-2}$	$1.8 \times 10^{-1}$	$8.8 \times 10^{-3}$

<sup>a</sup> Risks calculated based on a population density within 800 meters (0.5 mile) of the transportation route.

<sup>b</sup> LCF from accidental release is a population risk (probability × consequence).

1  
2 Table 4-13 presents the radiological risk from each type of shipment to a member of the general  
3 public who is an MEI (calculated using RADTRAN 5). The MEI is defined as being located  
4 30 meters (98 feet) from a shipment passing at a speed of 24 kilometers per hour (15 miles per  
5 hour) (NRC, 1977). MEI dose and risk are dependent only on the cargo dose rate, not on the  
6 route or distance traveled.

7  
8 For members of the general public, the largest impacts from the shipment of radioactive  
9 materials are from incident-free transportation (one to two latent fatalities from the vehicle  
10 emissions per year and less than one fatality from traffic accidents per year). The high-range  
11 risk of LCFs would be approximately one per year from incident-free radiation exposure and no  
12 LCFs would be expected from postulated accidents. These impacts on the public would be  
13 SMALL, because the collective radiation exposure would be distributed among all people along  
14 the transportation routes and each exposed individual would receive a minimal dose. The  
15 greatest radiological risk to an MEI would be from empty product cylinders (risk of  $2.1 \times 10^{-7}$ , or  
16 1 chance in 4.8 million) and the associated dose would be less than 0.00001 percent of the

**Table 4-13 Risk to the MEI from a Single Radioactive Material Shipment<sup>a</sup>**

Material	Dose (rem)	LCF <sup>b</sup>
Feed	$1.9 \times 10^{-4}$	$1.1 \times 10^{-7}$
Product	$6.9 \times 10^{-5}$	$4.1 \times 10^{-8}$
Depleted UF <sub>6</sub> /tails	$1.6 \times 10^{-4}$	$9.6 \times 10^{-8}$
Empty feed	$2.9 \times 10^{-4}$	$1.7 \times 10^{-7}$
Empty product	$3.5 \times 10^{-4}$	$2.1 \times 10^{-7}$
Empty depleted UF <sub>6</sub> /tails	$2.5 \times 10^{-4}$	$1.5 \times 10^{-7}$
Waste	$2.1 \times 10^{-6}$	$1.3 \times 10^{-9}$

<sup>a</sup> MEI is located 30 m from a passing shipment that is traveling 24 km/h (15 mph).

<sup>b</sup> LCFs based on risk of  $6 \times 10^{-4}$  fatal cancer per person-rem (EPA, 1999).

1  
2 100-millirem annual regulatory limit for members of the general public. No LCFs would be  
3 expected from incident-free radiation exposure to transportation crews, so these impacts would  
4 also be SMALL.

5  
6 Import and Export Impacts  
7

8 As noted in the previous section, AES has indicated that the proposed EREF could import feed  
9 materials from overseas suppliers or export enriched product to overseas purchasers (AES,  
10 2010a). In this case, the proposed EREF would need to comply with licensing and other  
11 requirements for import and export activities in 10 CFR Part 110. Any import or export activity  
12 would also need to be conducted in accordance with transportation security requirements in  
13 10 CFR Part 73. Transportation security for the proposed EREF should be addressed in a  
14 physical security plan. The discussion below summarizes expected transportation impacts  
15 associated with potential import/export activities along routes to the two seaports identified by  
16 AES (Portsmouth, Virginia, and Baltimore, Maryland).

17  
18 For this EIS, the NRC staff performed analyses for the transportation of enriched uranium from  
19 the proposed EREF to fuel fabrication facilities in Wilmington, North Carolina (Global Nuclear  
20 Fuels-America); Columbia, South Carolina (Westinghouse Electric); and Richland, Washington  
21 (AREVA NP). These analyses are representative of enriched uranium shipments from the  
22 proposed EREF to the seaports identified above, because the truck and rail routes that would  
23 be used in transporting enriched uranium to these seaports have similar distances and  
24 population densities to the routes analyzed for shipments to the domestic fuel fabrication facility  
25 destinations.

26  
27 The NRC staff also performed analyses for the transportation of feed material to the proposed  
28 EREF from Port Hope, Ontario, Canada. This analysis is considered representative of potential  
29 feed material shipments from the seaports to the proposed EREF, because the distances,

1 population densities, and expected external radiation doses for such shipments would not be  
2 significantly different from those already analyzed.

3  
4 Therefore, for shipments of both enriched uranium and feed material to or from seaports,  
5 transportation impacts (incident-free and accidents) would be SMALL and would not be  
6 significantly different from transportation impacts referenced above.

#### 7 8 Chemical Impacts during Transportation of Radioactive Materials

9  
10 In addition to the potential radiological impacts from the shipment of  $UF_6$ , chemical impacts from  
11 an accident involving  $UF_6$  could affect the surrounding environment and public. No chemical  
12 impacts are expected during normal transportation conditions as no releases from packaging  
13 would occur. However, when released from a shipping container,  $UF_6$  would react with moisture  
14 in the atmosphere to form hydrofluoric acid and uranyl fluoride ( $UO_2F_2$ ), which are chemically  
15 toxic to humans. Hydrofluoric acid is extremely corrosive and can damage the lungs and result  
16 in death if inhaled at high enough concentrations. Uranium compounds, in addition to being  
17 radioactive, can have toxic chemical effects (primarily on the kidneys) if they enter by way of  
18 ingestion and/or inhalation (DOE, 2004a,b).

19  
20 The potential chemical impacts resulting from transportation accidents involving depleted  $UF_6$   
21 have been analyzed in EISs previously published by DOE (DOE, 2004a,b). The results of these  
22 analyses were used to estimate the chemical impacts associated with the proposed EREF and  
23 are discussed in Appendix D. The results are applicable because the chemical impact analysis  
24 performed by DOE is independent of shipping route and level of enrichment. Chemical impacts  
25 would be only dependent on the quantity of  $UF_6$  being transported. In addition, the proposed  
26 EREF would use the same containers (Type 48Y cylinders) that DOE evaluated. The DOE  
27 analyses showed the estimates of irreversible adverse effects from chemical exposure to be  
28 approximately 1 to 3 orders of magnitude lower than the estimates of public latent cancer  
29 fatalities from radiological accident exposure. Since the estimated public health effects from  
30 radiological accident exposure would be SMALL, the chemical impacts would also be SMALL.

#### 31 32 **4.2.9.3 Mitigation Measures**

33  
34 Measures identified by AES to mitigate transportation impacts during preconstruction activities,  
35 construction, and facility operation include (AES, 2010a):

- 36  
37 • encourage carpooling and minimize traffic due to employee travel
- 38  
39 • stagger shift changes to reduce the peak traffic volume on US 20
- 40  
41 • promptly remove earthen materials on paved roads or the proposed EREF site carried onto  
42 the roadway by wind, trucks, or earthmoving equipment
- 43  
44 • promptly stabilize or cover bare earthen areas once roadway and highway entrance  
45 earthmoving activities are completed
- 46  
47 • cover open-bodied trucks that transport materials likely to give rise to airborne dust



- 1 • construct acceleration and deceleration lanes at the entrances to the proposed EREF site to  
2 improve traffic flow and safety on US 20  
3
- 4 • construct acceleration and deceleration lanes (or a grade-separated interchange) on US 20  
5 at the entrances to the proposed EREF site to improve traffic flow and safety  
6
- 7 • build gravel pads at the proposed EREF entry/exit points along US 20 in accordance with  
8 the Idaho Department of Environmental Quality (IDEQ) *Catalog of Stormwater Best*  
9 *Management Practices for Idaho Cities and Counties, Volume 2, Erosion and Sediment*  
10 *Controls* (IDEQ, 2009)  
11
- 12 • apply periodic top dressing of clean stone to the gravel pads, as needed, to maintain the  
13 effectiveness of the stone voids  
14
- 15 • perform tire washing, as needed, on a stabilized stone (gravel) area that drains to a  
16 sediment trap  
17
- 18 • prior to entering US 20, inspect vehicles for cleanliness from dirt and other matter that could  
19 be released onto the highway  
20
- 21 • maintain low speed limits onsite to reduce noise and minimize impacts on wildlife  
22

23 The NRC identified the following additional mitigation measures to reduce transportation  
24 impacts during facility operation:

- 25 • consider working with INL to operate a joint bus system  
26
- 27 • establish shift changes outside of INL peak commuting periods  
28  
29

30 The ITD would review any access permit application, as noted in Table 1-3. If a permit is  
31 issued, ITD may assign mitigation measures specific to the proposed EREF (e.g., turning  
32 lanes).  
33

#### 34 **4.2.10 Public and Occupational Health Impacts** 35

36 This section analyzes the potential impacts on public and occupational health from proposed  
37 EREF preconstruction/construction and operation. The analysis is divided into two main  
38 sections: nonradiological impacts and radiological impacts.  
39

40 The analysis of nonradiological impacts during the preconstruction and facility construction  
41 phase includes estimated numbers of injuries and illnesses incurred by workers and an  
42 evaluation of impacts due to exposure to chemicals and other nonradiological substances, such  
43 as particulate matter (dust) and vehicle exhaust. All such potential nonradiological impacts  
44 would be SMALL. Analysis of nonradiological impacts during facility operation likewise  
45 evaluates the numbers of expected illnesses and injuries and impacts from exposure to toxic  
46 chemicals used or present during operations, mainly uranium and HF. These impacts would be  
47 SMALL.  
48

1 No radiological impacts are expected during preconstruction and initial facility construction, prior  
2 to radiological materials being brought onsite. The radiological impacts analysis for facility  
3 operations addresses both public and occupational exposures to radiation. Exposures to  
4 construction workers completing facility construction during initial phases of operation are also  
5 evaluated. Evaluated exposure pathways include inhalation of airborne contaminants, ingestion  
6 of contaminated food crops, and direct exposure from material deposited on the ground and  
7 external exposure associated with stored UF<sub>6</sub> cylinders. Impacts from exposure of members of  
8 the public would be SMALL. Worker exposures would vary by job type, but would be carefully  
9 monitored and maintained as low as reasonably achievable (ALARA) and impacts would be  
10 SMALL.

#### 11 12 **4.2.10.1 Preconstruction and Construction**

13  
14 This section evaluates the potential for occupational injuries and illnesses associated with the  
15 proposed preconstruction and construction activities. It also evaluates the potential public and  
16 occupational health impacts from nonradiological and radiological releases during  
17 preconstruction and construction.

#### 18 19 **Occupational Injuries and Illnesses**

20  
21 The proposed EREF project involves a major construction activity with the potential for industrial  
22 accidents related to construction-vehicle accidents, material-handling accidents, and trips and  
23 falls. Resultant injuries could range from minor temporary injuries to long-term injuries and/or  
24 disabilities, and even to fatalities. The proposed activities are not anticipated to be any more  
25 hazardous than those for other major industrial construction or demolition projects.

26  
27 Numbers of injuries and illnesses potentially incurred by workers during preconstruction and  
28 construction were estimated using annual injury and illness data for heavy construction  
29 compiled by the U.S. Department of Labor (DOL) Bureau of Labor Statistics (BLS). For  
30 preconstruction and construction of the proposed EREF, North American Industry Classification  
31 System Code 237, "Other Heavy and Civil Engineering Construction," is applicable. Incident  
32 rates for total recordable cases and lost workday cases for calendar year 2007 for this activity  
33 code were obtained from the BLS data for 2007 (BLS, 2008a). Fatality incident rates for 2007  
34 were taken from BLS data for construction occupations (BLS, 2008b) to estimate potential  
35 fatalities during preconstruction and construction of the proposed EREF. The number of  
36 construction workers per year (full-time equivalents [FTEs]) and the duration of construction  
37 were obtained from AES's ER (AES, 2010a). The incident rates for total recordable cases, lost  
38 workday cases, and fatalities were applied to the number of construction workers per year and  
39 the construction schedule to estimate the total number of respective incidents. The estimated  
40 total incidents are summarized in Table 4-14.

41  
42 A total of 202 nonfatal illnesses and injuries and less than one fatality are estimated during the  
43 projected 7 years of heavy preconstruction and construction activities based on peak  
44 construction levels. The numbers of such incidents would be substantially smaller during the  
45 four following years of assemblage and testing of the proposed project, as a much smaller  
46 number of worker-years would be involved, while the nature of work would shift from primarily  
47 structural crafts to primarily electrical and mechanical crafts with typically lower injury rates.

**Table 4-14 Estimated Occupational Health Related Incidences during Preconstruction and Construction**

FTE		Injury and Illness Cases		Lost Workday Cases		Fatalities	
FTEs per Year	Total FTE <sup>a</sup>	Incidents per 100 FTEs <sup>b</sup>	Total Recordable Cases	Incidents per 100 FTEs <sup>b</sup>	Lost Workday Cases	Incidents per 100,000 FTEs <sup>c</sup>	Total Fatalities
590	4130	4.9	202	2.6	107	12.3	0.51

<sup>a</sup> FTEs = full time equivalents; total FTEs based on 7 years at a peak level of 590 per year.

<sup>b</sup> BLS, 2008a.

<sup>c</sup> BLS, 2008b.

1

2

Based on these estimates, impacts on occupational safety from preconstruction and construction would be SMALL.

3

4

5

**Nonradiological Exposures**

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Occupational exposures during preconstruction and construction would include exposure of construction workers to airborne fugitive dust generated from vehicle traffic and heavy equipment use, exposure to pollutants emitted from diesel- and gasoline-powered equipment (e.g., CO, NO<sub>x</sub>, SO<sub>x</sub>, and PM), and exposure to vapors from any fuels, paints, or solvents that are used. Any such exposures would be minor and would be minimized using the work practices and personal protective equipment as required by OSHA (29 CFR 1910). Such exposures would be typical of other construction projects of industrial facilities. Therefore, impacts to workers from chemical and dust exposure during preconstruction and construction would be SMALL.

17

18

19

20

21

22

23

Approximately 10 percent of the total occupational injury and nonradiological impacts discussed above would occur from the preconstruction activities. This value is based on AES's estimate that the preconstruction activities would be completed within the first 8 months of a total 84-month construction schedule (AES, 2009b). This 10 percent estimate is likely an upper bound, as fewer workers would be expected to be involved during preconstruction than during the main facility construction phase.

24

**Radiological Exposures**

25

26

27

28

29

The radionuclide concentrations at the proposed EREF site are either at or below background natural levels (see Section 3.6.4). Therefore, there would not be any radiological impacts above normal background levels.

30

**4.2.10.2 Facility Operation**

31

32

33

34

35

36

This section evaluates the potential for occupational injuries and illnesses associated with the operation of the proposed EREF. It also evaluates the potential public and occupational health impacts from nonradiological and radiological releases during facility operation.

1 **Occupational Injury and Illness Rates and Fatalities**

2  
3 Workplace safety regulations are administered by the Occupational Safety and Health  
4 Administration (OSHA). Occupational hazards would be minimized when workers adhere to  
5 safety standards and use appropriate protective equipment; however, fatalities and injuries from  
6 accidents could still occur.

7  
8 The ER summarizes a comparison of yearly reportable lost-time accidents for fiscal years 2003–  
9 2007 for the similar URENCO Capenhurst Limited uranium enrichment facility in Great Britain.  
10 The OSHA lost workday case rates varied from 0 to 1.62 per 100 FTE workers (FTEs) per year  
11 (AES, 2010a). For comparison, the BLS compiles annual injury and illness incidence rates by  
12 industry (BLS, 2008a). The national average incidence rate of nonfatal occupational injuries  
13 and illnesses resulting in lost workdays for classification 325, “Chemical Manufacturing,” for  
14 calendar year 2007 was 0.8 per 100 FTEs per year, which is within range of 0 to 1.62 reported  
15 for the Capenhurst enrichment facility. Thus, the rates of occupational injuries and illnesses at  
16 the proposed EREF would be expected to be similar to those at the existing Capenhurst facility  
17 and to those in the chemical manufacturing industry in general.

18  
19 Assuming an estimated 550 FTEs during operation of the proposed EREF (AES, 2010a) and  
20 using a rate of 3.1 total incidents and 0.8 lost-time injuries and illnesses per 100 workers,  
21 17 total incidents and 4.4 lost-time injuries and illnesses per year would be projected. For an  
22 operating period of 30 years, 512 total incidents and 132 lost-time incidents would be projected,  
23 as shown in Table 4-15.

24  
25 The number of fatal accidents projected during operations was computed assuming an incident  
26 rate of 2.0 per 100,000 FTEs for chemical manufacturing (BLS, 2008b). For 30 years of  
27 operation, less than one fatality is projected. Accordingly, impacts for occupational illnesses  
28 and injuries and fatalities during facility operation would be SMALL.

29  
30 **Nonradiological Exposures**

31  
32 Chemical exposures of primary concern to workers and members of the public during plant  
33 operations would be to UF<sub>6</sub> vapors and HF, which are produced along with UO<sub>2</sub>F<sub>2</sub> when UF<sub>6</sub>  
34 vapors contact moisture in air. Exposures to uranium compounds and HF would be of similar  
35 concern, given similar exposure standards for these chemicals in occupational settings.  
36 However, the potential for exposures to any of these chemicals during normal operations would  
37 be slight, since the UF<sub>6</sub> process line is maintained at subatmospheric pressure. Exposure risks  
38 at process line points where feed and product vessels are connected and disconnected would  
39 be minimized through the use of flexible fume collection lines operated at subatmospheric  
40 pressure and through the use of personal protective equipment by workers. Handling of all  
41 chemicals would be done in accordance with the Environment, Health, and Safety Program for  
42 the proposed EREF, which would conform to 29 CFR 1910 and specify the use of engineering  
43 controls, including personal protective equipment, to minimize chemical exposures during  
44 operations (AES, 2010a).

45  
46 Process ventilation lines would be run to chemical traps before venting to the outdoors to  
47 prevent exposures to the public. AES estimates that the annual average HF concentration  
48 emission from a nominal 6 million SWU per year centrifuge enrichment plant would be

**Table 4-15 Estimated Occupational Health-Related Incidences during Plant Operation**

FTE		Injury and Illness Cases		Lost Workday Cases		Fatalities	
FTEs per Year	Total FTE <sup>a</sup>	Incidents per 100 FTEs <sup>b</sup>	Total Recordable Cases	Incidents per 100 FTEs <sup>b</sup>	Lost Workday Cases	Incidents per 100,000 FTEs <sup>c</sup>	Total Fatalities
550	16,500	3.1	512	0.8	132	2.0	0.33

<sup>a</sup> Assumes 30 years of operation.

<sup>b</sup> BLS, 2008a.

<sup>c</sup> BLS, 2008b.

1  
2 7.7 micrograms per cubic meter (0.0094 ppm) at the point of discharge (rooftop) based on  
3 annual emission of less than 2.0 kilograms (4.4 pounds) (AES, 2010a). This concentration is  
4 well below the occupational exposure limit of 2.5 milligrams per cubic meter (3.1 ppm) for 8-hour  
5 exposure set by both OSHA and the National Institute for Occupational Safety and Health  
6 (NIOSH) (ATSDR, 2003). Workers would not be expected to be exposed to HF concentrations  
7 greater than that at the discharge point.

8  
9 Taking atmospheric dispersion into consideration, the discharge point concentration would fall to  
10  $3.4 \times 10^{-4}$  micrograms per cubic meter ( $4.2 \times 10^{-7}$  ppm) at the proposed property boundary  
11 1100 meters (3600 feet) to the north, based on dispersion modeling (see Appendix E), and to  
12 even lower levels at further distances where members of the public might be exposed. These  
13 levels are several orders of magnitude below Idaho's AAC of 125 micrograms per cubic meter  
14 (0.15 ppm) for fluoride (IDAPA 58.01.01).

15  
16 Occupational and public exposure to uranium compounds,  $UF_6$  and  $UO_2F_2$ , would be to  
17 concentrations similar to or less than that of HF. Using releases from a 1.5 million SWU plant  
18 described in NUREG-1484 (NRC, 1994) linearly scaled up to a 6.6 million SWU facility, the size  
19 of the proposed EREF, results in an estimated annual gaseous release of 743 grams  
20 (1.63 pounds) of uranium which is about half the estimate of the annual HF release.  
21 Conservatively applying the same dispersion factors as used for HF, uranium concentrations at  
22 the proposed property boundary would be on the order of  $1 \times 10^{-4}$  microgram per cubic meter.  
23 While no Federal or Idaho ambient air standard is available for uranium with which to compare  
24 this level, it is more than five orders of magnitude below the NIOSH and OSHA occupational  
25 exposure limit of 50 micrograms per cubic meter (soluble uranium forms, 8-hour time weighted  
26 average) (NIOSH, 1996, 2005).

27  
28 Occupational exposures would be expected to be low, but might be briefly elevated to some  
29 workers during cylinder connection and disconnection activities. Estimates of such "puff"  
30 emissions of  $UF_6$  performed for the proposed American Centrifuge Plant in Piketon, Ohio, of up  
31 to 0.7 milligram per cubic meter (NRC, 2006) are similar to the short-term exposure limit of  
32 0.6 milligram per cubic meter for uranium set by the American Conference of Governmental  
33 Industrial Hygienists (NIOSH, 1996), and well below the NIOSH "Immediately Dangerous to Life  
34 and Health" standard of 10 milligrams per cubic meter for exposures over a 1-hour period  
35 (NIOSH, 1996). At the proposed EREF, any such brief exposures would be mitigated with a  
36 gaseous effluent ventilation system (AES, 2010a), which would be expected to maintain levels  
37 below occupational health standards based on the similarity of the design of the proposed  
38 EREF to that of the American Centrifuge Plant (NRC, 2006).



1 Thus, due to low estimated concentrations of uranium and HF at public (proposed property  
2 boundary) and workplace receptor locations, the public and occupational health impacts due to  
3 exposures to hazardous chemicals during normal operations would be SMALL.  
4

### 5 **Radiological Exposures**

6  
7 Exposure to uranium may occur from routine operations as a result of small controlled releases  
8 to the atmosphere from the uranium enrichment process lines and decontamination and  
9 maintenance of equipment, releases of radioactive liquids to surface water, and as a result of  
10 direct radiation from the process lines, storage, and transportation of UF<sub>6</sub>. Direct radiation and  
11 skyshine (radiation reflected from the atmosphere) in offsite areas due to operations within the  
12 SBMs is expected to be undetectable because most of the direct radiation associated with the  
13 uranium would be almost completely absorbed by the heavy process lines, walls, equipment,  
14 and tanks that would be employed at the proposed EREF, and would have to travel 8 kilometers  
15 to reach the nearest member of the public.  
16

17 At the proposed EREF, the major source of occupational exposure would be from direct  
18 radiation from UF<sub>6</sub> with the largest exposure source being the empty Type 48Y cylinders with  
19 residual material, full Type 48Y cylinders containing either the feed material or depleted UF<sub>6</sub>,  
20 Type 30B product cylinders, and various traps that help minimize UF<sub>6</sub> losses from the cascade  
21 (AES, 2010a). Atmospheric releases would be expected to be a source of public exposure.  
22 Such releases would be primarily controlled through the Technical Support Building and SBM  
23 gaseous effluent vent systems (AES, 2010a).  
24

### 25 **Radiological Sources**

26  
27 The estimated release of gaseous uranium from the proposed EREF would be less than  
28 20 grams (0.7 ounces) per year (AES, 2010a). However, for conservatism, the radiological  
29 impacts to both workers and members of the public were modeled, using the CAP88-PC  
30 computer code (EPA, 2009d), on the basis of releases from a 1.5 million SWU plant described  
31 in NUREG-1484 (NRC, 1994), *Final Environmental Impact Statement for the Construction and*  
32 *Operation of Claiborne Enrichment Center, Homer, Louisiana*, linearly scaled up to a 6.6 million  
33 SWU facility resulting in an annual gaseous release of 743 grams (1.63 pounds) of uranium  
34 (AES, 2010a). This corresponds to an activity concentration of 19.5 megabecquerels  
35 (527 microcuries) (AES, 2010a).  
36

37 During the time period when the proposed EREF is operational and construction activities  
38 continue, construction workers would be exposed to gaseous uranium effluents and external  
39 radiation from UF<sub>6</sub> cylinders. For conservatism, the same 19.5-megabecquerel (527-microcurie)  
40 annual release was used when estimating the dose from airborne releases during construction  
41 and operation. Two different release points were used to model doses to the construction  
42 workers during the period of expansion. One release point was associated with the Technical  
43 Service Building and the other release point was associated with the Separation Building  
44 Modules (AES, 2009b). For the external dose calculations, the construction workers were  
45 conservatively modeled, using the MCNP computer code (X5 Monte Carlo Team, 2003), as  
46 being positioned in the cylinder yard as if they were completing the last 20 percent of the  
47 cylinder pad, when the largest amount of material is in storage during construction, and thus

1 were exposed to external radiation from stored UF<sub>6</sub> tails, full UF<sub>6</sub> feed, and empty cylinders  
2 (AES, 2009b).

3  
4 Doses to members of the public were modeled, using CAP88-PC (EPA, 2009d), based on the  
5 same 19.5-megabecquerel (527-microcurie) annual release from the proposed EREF. Due to  
6 the distance (8000 m) of the nearest resident to the TSB and SBM, all releases were modeled  
7 as originating from a single source. For the external pathway it was conservatively assumed  
8 members of the public were exposed to a full cylinder storage pad (AES, 2010a). Table 4-16  
9 provides the radiological sources used for the normal operation impact assessment for  
10 occupational workers and members of the public.

### 11 12 Occupational Exposure

13  
14 Occupational exposure to radioactive material could result from releases to the atmosphere  
15 from the proposed EREF through stack releases from the Technical Support Buildings and  
16 SBMs gaseous effluent vent system and direct external radiation from the Cylinder Storage Pad.

17  
18 The expected exposure pathways for the public include inhalation of airborne contaminants,  
19 direct exposure from material deposited on the ground, and external exposure associated with  
20 the stored UF<sub>6</sub> cylinders.

21  
22 Two groups of workers were evaluated, the construction worker dose during the overlap period  
23 when construction is continuing at the proposed EREF and routine operations have begun, and  
24 the worker population supporting the proposed EREF during operations.

25  
26 The construction worker population dose was modeled by considering 10 different receptor  
27 locations around the proposed EREF (AES, 2009b). Receptors 1 to 4 considered the  
28 construction workers at the SBMs and the UF<sub>6</sub> handling areas, and receptors 5 to 10 considered  
29 the storage pad workers completing the last 20 percent of the UF<sub>6</sub> Cylinder Storage Pad  
30 (AES, 2009b). Table 4-17 provides the atmospheric dispersion factors ( $\chi/Q$ ) used in the dose  
31 calculations for the collective construction worker population dose during the overlap period of  
32 construction and operations. Table 4-18 provides the worker population distribution and  
33 duration of exposure during this period of construction and operation overlap.

34  
35 Table 4-19 provides a summary of the dose impacts to the construction workers during the  
36 overlap period of construction and operations. The collective construction worker annual  
37 population dose was estimated to be 0.376 person-sievert (37.6 person-rem) with over  
38 99.99 percent of the radiation dose being attributable to the external dose associated with the  
39 stored UF<sub>6</sub> cylinders.

40  
41 The most significant impact would be from direct radiation exposure to the construction workers  
42 completing the cylinder storage pads. The dose to an average construction worker completing  
43 the last 20 percent of the UF<sub>6</sub> cylinder pad is estimated to receive a dose of 1.96 millisieverts  
44 per year (196 millirem per year). Since this dose exceeds the limit specified in 10 CFR 20.1301,  
45 these workers should be part of a radiation dosimetry program and reclassified as radiation  
46 workers.

**Table 4-16 Source Term Used for the Radiological Impact Assessment for Normal Operations<sup>a</sup>**

<b>Radionuclide</b>	<b>Wt %</b>	<b>Activity MBq (μCi)</b>
<sup>234</sup> U	5.5 × 10 <sup>-3</sup>	9.5 (260)
<sup>235</sup> U	0.71	0.5 (10)
<sup>238</sup> U	99.3	9.5 (260)
<b>Total</b>		<b>19.5 (530)</b>

<sup>a</sup> Members of the general public, 6.6-million-SWU facility. Annual uranium released: 760 grams, 19.5 MBq (530 μCi).

Source: Derived from AES, 2010a.

1  
2 Table 4-20 provides estimated annual doses for representative workers within the proposed  
3 EREF, and Table 4-21 provides estimated dose rates for workers at several areas at the  
4 proposed EREF. Annual whole-body dose equivalents accrued by workers at an operating  
5 uranium enrichment plant are typically low and range from 0.22 to 0.44 millisievert (22 to  
6 44 millirem) (URENCO, 2003, 2004, 2005, 2006, 2007). In general, annual doses to workers  
7 are expected to range from 0.050 millisievert per year (5 millirem per year) for general office  
8 staff to 3 millisieverts per year (300 millirem per year) for cylinder handlers. For the proposed  
9 EREF, AES has proposed an administrative limit of 0.01 sievert per year (1 rem per year) to any  
10 radiation worker. This limit is 20 percent of the limit provided in 10 CFR 20.1201. Impacts to  
11 workers at the proposed EREF are expected to be typical of similar facilities, and would be  
12 SMALL.

13  
14 Public Exposure

15  
16 Public exposure to radioactive material could result from releases to the atmosphere from the  
17 proposed EREF through stack releases from the Technical Support Building and SBM gaseous  
18 effluent vent systems. Also, although members of the public would not be expected to spend a  
19 significant amount of time at the property boundary closest to the Cylinder Storage Pad, this  
20 exposure possibility is considered in the impact assessment. The analysis estimated the  
21 potential radiation dose to the collective population residing within 80 kilometers (50 miles) of  
22 the proposed EREF, a hypothetical MEI located at the proposed EREF property boundary and  
23 the nearest resident who lives 8 kilometers (5 miles) from the proposed EREF.

24  
25 The expected exposure pathways for the public include: inhalation of airborne contaminants,  
26 external exposure from material deposited on the ground, external exposure associated with the  
27 stored UF<sub>6</sub> cylinders, and ingestion of resuspended soil. In addition, members of the public may  
28 be exposed to uranium compounds that are incorporated into the edible portions of plants and  
29 animals. These additional exposure pathways include the ingestion of vegetables, the ingestion  
30 of locally produced meat, and the ingestion of locally produced milk. Table 4-22 provides the  
31 population distribution used to estimate the collective population dose for airborne releases  
32 associated with the proposed EREF. Table 4-23 provides the locations and exposure times for

**Table 4-17 Locations and Annual Average Atmospheric Dispersion Factors  $\chi/Q$  ( $s/m^3$ ) for the Construction Workers during the Period of Construction and Operations Overlap**

<b>Receptor Location</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
Direction/distance from release point 1 to receptor location (m) <sup>a</sup>	WSW/202	WSW/101	SW/241	SW/173	N/310	NNW/317	NNW/349	N/504	N/515	NNE/533
Atmospheric dispersion factors ( $s/m^3$ )	$1.18 \times 10^{-4}$	$2.88 \times 10^{-4}$	$7.84 \times 10^{-5}$	$1.34 \times 10^{-4}$	$5.65 \times 10^{-5}$	$4.73 \times 10^{-5}$	$3.93 \times 10^{-5}$	$2.33 \times 10^{-5}$	$2.24 \times 10^{-5}$	$1.80 \times 10^{-5}$
Direction/distance from release point 2 to receptor location (m) <sup>a</sup>	W/252	WNW/151	WSW/252	WSW/158	N/389	NNW/414	NNE/410	N/587	NNW/605	NNE/601
Atmospheric dispersion factors ( $s/m^3$ )	$5.70 \times 10^{-5}$	$6.32 \times 10^{-5}$	$8.29 \times 10^{-5}$	$1.70 \times 10^{-4}$	$3.76 \times 10^{-5}$	$2.94 \times 10^{-5}$	$2.93 \times 10^{-5}$	$1.76 \times 10^{-5}$	$1.47 \times 10^{-5}$	$1.44 \times 10^{-5}$

<sup>a</sup> Source: AES, 2009b.

**Table 4-18 Worker Population Distribution during the Period of Construction and Operations Overlap**

Labor Craft	Plant Area	Craft Hours per Year	Persons
Civil/structural	UF <sub>6</sub> handling	109,174	54
	SBM	269,296	134
	Cylinder pad	24,729	12
Mechanical	UF <sub>6</sub> handling	65,504	32
	SBM	161,577	80
	Cylinder pad	14,837	7
Electrical	UF <sub>6</sub> handling	43,669	22
	SBM	107,718	53
	Cylinder pad	9891	5
Totals	UF <sub>6</sub> handling	218,348	108
	SBM	538,592	267
	Cylinder pad	49,459	24.5

Source: AES, 2009b.

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the public receptors evaluated in the radiological impact assessment. The impacts of normal operations at the proposed EFEF to public health would be SMALL.

The most significant impact would be from direct radiation exposure to public receptors close to the storage of full feed, full tails, and empty Cylinder Storage Pads.

For conservatism the dose to the maximally exposed individual was calculated at the proposed northern site boundary since this was the location of both the maximum external and inhalation dose to a receptor. The dose was calculated assuming 2000 hours per year occupancy. The 2000 hours per year was selected as the exposure time assuming a 40-hour work week and that any developments adjacent to the proposed EREF would be commercial resulting in a person occupying the adjacent site part time (approximately 2,000 hours per year rather than a full time (8,760 hours per year). The dose equivalent for this exposure scenario was estimated to be 0.014 millisievert per year (1.4 millirem per year)

The collective population dose for persons living within 80 kilometers (50 miles) of the proposed EREF was estimated to be  $1.7 \times 10^{-5}$  person-sievert ( $1.7 \times 10^{-3}$  person-rem). The dominant pathway is inhalation, which comprises approximately 88 percent of the total dose. Due to the large distance between the population and the stored UF<sub>6</sub> cylinders, the entire dose is due to atmospheric releases of uranium compounds during normal operations. Table 4-24 provides the calculated atmospheric dispersion factors ( $\chi/Q$ ) used in the dose calculations for members of the general public.



**Table 4-19 Summary of Annual Radiological Impacts Associated with the Construction Workers during the Overlap Period of Construction and Operations at the Proposed EREF**

Receptor	Atmospheric Dispersion Factors <sup>a</sup> (s/m <sup>3</sup> )	Dose Associated with Air Releases person-Sv (person-rem) or mSv (mrem)	Dose Associated with Direct Radiation from Stored UF <sub>6</sub> Cylinders person-Sv (person-rem) or mSv (mrem)	Total Committed Effective Dose person-Sv (person-rem) or mSv (mrem)
Construction worker Population: SBM + UF <sub>6</sub> handling area		1.57 × 10 <sup>-4</sup> (1.57 × 10 <sup>-2</sup> )	0.136 <sup>b</sup> (13.6)	0.136 (13.6)
Storage pad		2.39 × 10 <sup>-6</sup> (2.39 × 10 <sup>-4</sup> )	0.24 <sup>b</sup> 24	0.24 24
Total		1.59 × 10 <sup>-4</sup> (1.59 × 10 <sup>-2</sup> )	<b>0.376</b> <b>(37.6)</b>	<b>0.376</b> <b>(37.6)</b>
Construction pad worker	5.65 × 10 <sup>-5 c</sup>	1.59 × 10 <sup>-7 d</sup> (1.59 × 10 <sup>-5</sup> )	1.96 <sup>b</sup> (196)	1.96 (196)
Regulatory limit for Individual				0.1 <sup>e</sup> ; 1 <sup>f</sup> ; 5 <sup>g</sup> (10:100:500)

<sup>a</sup> The atmospheric dispersion factors are provided in Table 4-16.

<sup>b</sup> Source: AES, 2009b.

<sup>c</sup> This represents the maximum atmospheric dispersion factor for the six areas (locations 5-10) that were modeled for the construction pad worker. See Table 4-16.

<sup>d</sup> For airborne releases, the construction worker is assumed to be present in the area yielding the largest inhalation dose.

<sup>e</sup> Source: 10 CFR 20.1101 (applies to airborne releases only).

<sup>f</sup> Source: 10 CFR Part 20, Subpart D.

<sup>g</sup> Source: 10 CFR Part 20, Subpart C.

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**Table 4-20 Estimated Occupational Annual Exposures for Various Occupations for the Proposed EREF**

Position	Annual Dose Equivalent mSv (mrem)
General office staff	<0.05 (<5.0)
Typical operations and maintenance technician	1 (100)
Typical cylinder handler	3 (300)

Source: AES, 2010a.

2

**Table 4-21 Estimated Dose Rates at Various Locations within the Proposed EREF**

Position	Dose Rate mSv per hour (mrem per hour)
Plant general area	0.0001 (0.01)
Separation building cascade halls	0.0005 (0.05)
Separation building	0.001 (0.1)
Empty used UF <sub>6</sub> shipping cylinder on contact	0.1 (10)
At 1 meter (3.3 feet)	0.01 (1)
Full UF <sub>6</sub> shipping cylinder on contact	0.05 (5)
At 1 meter (3.3 feet)	0.002 (0.2)

Source: AES, 2010a.

1  
2 The dose to the nearest resident was estimated to be  $2.12 \times 10^{-6}$  millisievert per year  
3 ( $2.12 \times 10^{-4}$  millirem per year). Due to the large distance between the stored UF<sub>6</sub> cylinders and  
4 the receptor, only the dose contribution is associated with the airborne release. The dominant  
5 pathway is inhalation comprising 94 percent of the total dose. For comparative purposes, this  
6 dose is over 470,000 times lower than the 0.1 millisievert per year (10 mrem per year) dose limit  
7 for members of the public as codified in 10 CFR 20.1101 for airborne releases.

8  
9 The dose to a member of the public at the proposed property boundary was estimated to be  
10 approximately 0.014 millisievert per year (1.4 millirem per year). Approximately 98.6 percent of  
11 the total dose to this individual is due to the external dose of the stored UF<sub>6</sub> cylinders. Since the  
12 vast majority of the dose is from external gamma radiation from the UF<sub>6</sub> cylinders, for  
13 comparative purposes, this dose is over 70 times lower than the 1 millisievert per year  
14 (100 mrem per year) dose limit for members of the public as codified in 10 CFR 20.1301.

15  
16 Table 4-25 provides a summary of all radiological impacts to members of the general public  
17 associated with the proposed EREF. Because of the low doses involved, these impacts would  
18 be SMALL.

19  
20 **4.2.10.3 Mitigation Measures**

21  
22 Plant design features such as controls and processes for the proposed EREF have been  
23 identified by AES to minimize the gaseous and liquid effluent releases, and to maintain the  
24 impacts to workers and the surrounding population below regulatory limits (AES, 2010b). These  
25 would include:

- 26  
27 • maintain system process pressures that are subatmospheric  
28  
29 • pass process gases through desublimers to solidify as much UF<sub>6</sub> as possible  
30

**Table 4-22 Extrapolated Population Distribution within 80 km (50 miles) of the Proposed EREF**

Direction	0-1.6 km (0-1 mi)	1.6-3.2 km (1-2 mi)	3.2-4.8 km (2-3 mi)	4.8-6.4 km (3-4 mi)	6.4-8.0 km (4-5 mi)	8.0-16 km (5-10 mi)	16-32 km (10-20 mi)	32-48 km (20-30 mi)	48-64 km (30-40 mi)	64-80 km (40-50 mi)
S	0	0	0	0	0	0	169	20,589	3835	61,264
SSW	0	0	0	0	0	0	49	757	1172	3477
SW	0	0	0	0	0	0	49	55	5	38
WSW	0	0	0	0	0	0	0	33	9	6
W	0	0	0	0	0	0	0	0	10	2142
WNW	0	0	0	0	0	0	0	56	220	562
NW	0	0	0	0	0	0	0	0	0	84
NNW	0	0	0	0	0	0	53	299	58	18
N	0	0	0	0	0	0	921	223	146	70
NNE	0	0	0	0	0	0	290	559	157	831
NE	0	0	0	0	0	3	193	8	1365	4882
ENE	0	0	0	0	0	3	1561	9655	29,946	4229
E	0	0	0	0	0	17	1004	13,654	3436	37
ESE	0	0	0	0	0	14	12,744	68,188	421	0
SE	0	0	0	0	0	0	741	10,303	21	2
SSE	0	0	0	0	0	75	142	6214	78	114

Source: AES, 2010a.

**Table 4-23 General Public Receptor Locations for Radiological Impact Assessment**

Receptor	Direction from the Source to the Receptor	Distance from Source to Receptor (m)	Time Spent at the Location (hr)
Nearest resident <sup>a</sup>	Northeast	8000	8761
Hypothetical member of the public at the proposed site boundary: <sup>b</sup>			2000
Cylinder pad	North	760	
Atmospheric release	North	1100	

<sup>a</sup> Source: AES, 2010a.

<sup>b</sup> Derived from AES, 2010a.

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- pass gaseous effluents through pre-filters, high-efficiency particulate air (HEPA) filters, and activated carbon filters to reduce the radioactivity in the final discharged effluent to very low concentrations
- investigate alternative solvents or apply control technologies for methylene chloride solvent use
- use administrative controls, practices, and procedures to assure compliance with the proposed EREF Health, Safety, and Environmental Program; design the program to ensure safe storage, use, and handling of chemicals to minimize the potential for worker exposure
- monitor all UF<sub>6</sub> process systems by instrumentation that will activate alarms in the Control Room and will either automatically shut down the facility to a safe condition or alert operators to take the appropriate action to prevent release in the event of operational problems
- put in place radiological practices and procedures to ensure compliance with the proposed EREF Radiation Protection Program; design the program to achieve and maintain radiological exposure to levels that are as low as reasonably achievable (ALARA)
- conduct routine facility radiation and radiological surveys to characterize and minimize potential radiological dose/exposure
- monitor all radiation workers by use of dosimeters and area air sampling to ensure that radiological doses remain within regulatory limits and are ALARA
- provide radiation monitors in the gaseous effluent vents to detect and alarm and effect the automatic safe shutdown of process equipment in the event contaminants are detected in the system exhaust; design systems to automatically shut down, switch trains, or rely on operator actions to mitigate the potential release

**Table 4-24 Annual Average Atmospheric Dispersion Factors  $\chi/Q$  (s/m<sup>3</sup>) for the General Population**

Direction	0-1.6 km (0-1 mi)	1.6-3.2 km (1-2 mi)	3.2-4.8 km (2-3 mi)	4.8-6.4 km (3-4 mi)	6.4-8.0 km (4-5 mi)	8.0-16 km (5-10 mi)	16-32 km (10-20 mi)	32-48 km (20-30 mi)	48-64 km (30-40 mi)	64-80 km (40-50 mi)
S	$3.86 \times 10^{-7}$	$1.92 \times 10^{-7}$	$1.11 \times 10^{-7}$	$7.54 \times 10^{-8}$	$5.58 \times 10^{-8}$	$3.02 \times 10^{-8}$	$1.26 \times 10^{-8}$	$6.60 \times 10^{-9}$	$3.98 \times 10^{-9}$	$2.53 \times 10^{-9}$
SSW	$6.11 \times 10^{-7}$	$2.90 \times 10^{-7}$	$1.65 \times 10^{-7}$	$1.12 \times 10^{-7}$	$8.24 \times 10^{-8}$	$4.48 \times 10^{-8}$	$1.88 \times 10^{-8}$	$1.00 \times 10^{-8}$	$6.15 \times 10^{-9}$	$4.00 \times 10^{-9}$
SW	$4.85 \times 10^{-7}$	$2.64 \times 10^{-7}$	$1.60 \times 10^{-7}$	$1.12 \times 10^{-7}$	$8.50 \times 10^{-8}$	$4.88 \times 10^{-8}$	$2.15 \times 10^{-8}$	$1.18 \times 10^{-8}$	$7.42 \times 10^{-9}$	$4.90 \times 10^{-9}$
WSW	$2.05 \times 10^{-7}$	$1.61 \times 10^{-7}$	$1.08 \times 10^{-7}$	$7.90 \times 10^{-8}$	$6.26 \times 10^{-8}$	$3.89 \times 10^{-8}$	$1.81 \times 10^{-8}$	$1.03 \times 10^{-8}$	$6.59 \times 10^{-9}$	$4.39 \times 10^{-9}$
W	$1.16 \times 10^{-7}$	$9.11 \times 10^{-8}$	$6.14 \times 10^{-8}$	$4.53 \times 10^{-8}$	$3.63 \times 10^{-8}$	$2.31 \times 10^{-8}$	$1.07 \times 10^{-8}$	$6.04 \times 10^{-9}$	$3.79 \times 10^{-9}$	$2.47 \times 10^{-9}$
WNW	$8.35 \times 10^{-8}$	$6.31 \times 10^{-8}$	$4.16 \times 10^{-8}$	$3.01 \times 10^{-8}$	$2.35 \times 10^{-8}$	$1.42 \times 10^{-8}$	$6.22 \times 10^{-9}$	$3.39 \times 10^{-9}$	$2.04 \times 10^{-9}$	$1.26 \times 10^{-9}$
NW	$8.15 \times 10^{-8}$	$6.59 \times 10^{-8}$	$4.40 \times 10^{-8}$	$3.19 \times 10^{-8}$	$2.49 \times 10^{-8}$	$1.50 \times 10^{-8}$	$6.56 \times 10^{-9}$	$3.60 \times 10^{-9}$	$2.19 \times 10^{-9}$	$1.37 \times 10^{-9}$
NNW	$1.66 \times 10^{-7}$	$1.38 \times 10^{-7}$	$9.41 \times 10^{-8}$	$6.93 \times 10^{-8}$	$5.51 \times 10^{-8}$	$3.42 \times 10^{-8}$	$1.60 \times 10^{-8}$	$9.21 \times 10^{-9}$	$6.00 \times 10^{-9}$	$4.09 \times 10^{-9}$
N	$2.88 \times 10^{-7}$	$2.06 \times 10^{-7}$	$1.36 \times 10^{-7}$	$9.82 \times 10^{-8}$	$7.67 \times 10^{-8}$	$4.61 \times 10^{-8}$	$2.10 \times 10^{-8}$	$1.19 \times 10^{-8}$	$7.60 \times 10^{-9}$	$5.08 \times 10^{-9}$
NNE	$5.19 \times 10^{-7}$	$2.75 \times 10^{-7}$	$1.66 \times 10^{-7}$	$1.16 \times 10^{-7}$	$8.77 \times 10^{-8}$	$5.03 \times 10^{-8}$	$2.25 \times 10^{-8}$	$1.26 \times 10^{-8}$	$8.15 \times 10^{-9}$	$5.59 \times 10^{-9}$
NE	$6.45 \times 10^{-7}$	$2.79 \times 10^{-7}$	$1.58 \times 10^{-7}$	$1.07 \times 10^{-7}$	$7.89 \times 10^{-8}$	$4.32 \times 10^{-8}$	$1.87 \times 10^{-8}$	$1.02 \times 10^{-8}$	$6.52 \times 10^{-9}$	$4.47 \times 10^{-9}$
ENE	$4.24 \times 10^{-7}$	$1.79 \times 10^{-7}$	$9.87 \times 10^{-8}$	$6.55 \times 10^{-8}$	$4.79 \times 10^{-8}$	$2.55 \times 10^{-8}$	$1.06 \times 10^{-8}$	$5.61 \times 10^{-9}$	$3.47 \times 10^{-9}$	$2.30 \times 10^{-9}$
E	$2.29 \times 10^{-7}$	$9.78 \times 10^{-8}$	$5.49 \times 10^{-8}$	$3.67 \times 10^{-8}$	$2.68 \times 10^{-8}$	$1.42 \times 10^{-8}$	$5.67 \times 10^{-9}$	$2.91 \times 10^{-9}$	$1.72 \times 10^{-9}$	$1.07 \times 10^{-9}$
ESE	$2.31 \times 10^{-7}$	$9.89 \times 10^{-8}$	$5.58 \times 10^{-8}$	$3.72 \times 10^{-8}$	$2.72 \times 10^{-8}$	$1.43 \times 10^{-8}$	$5.61 \times 10^{-9}$	$2.84 \times 10^{-9}$	$1.65 \times 10^{-9}$	$1.00 \times 10^{-9}$
SE	$2.69 \times 10^{-7}$	$1.14 \times 10^{-7}$	$6.31 \times 10^{-8}$	$4.18 \times 10^{-8}$	$3.04 \times 10^{-8}$	$1.59 \times 10^{-8}$	$6.29 \times 10^{-9}$	$3.20 \times 10^{-9}$	$1.87 \times 10^{-9}$	$1.15 \times 10^{-9}$
SSE	$3.18 \times 10^{-7}$	$1.49 \times 10^{-7}$	$8.45 \times 10^{-8}$	$5.67 \times 10^{-8}$	$4.16 \times 10^{-8}$	$2.22 \times 10^{-8}$	$8.98 \times 10^{-9}$	$4.64 \times 10^{-9}$	$2.75 \times 10^{-9}$	$1.72 \times 10^{-9}$

4-89



**Table 4-25 Summary of Radiological Impacts for Members of the Public Associated with the Proposed EREF**

Receptor	Atmospheric Dispersion Factors (s/m <sup>3</sup> )	Dose Associated with Air Releases (person-Sv (person-rem) or mSv (mrem))	Dose Associated with Direct Radiation from Stored UF <sub>6</sub> Cylinders (person-Sv (person-rem) or mSv (mrem))	Total Committed Effective Dose (person-Sv (person-rem) or mSv (mrem))
General population	See Table 4-24	$1.74 \times 10^{-5}$ ( $1.74 \times 10^{-3}$ )	~ 0	$1.74 \times 10^{-5}$ ( $1.74 \times 10^{-3}$ )
Nearest resident	$1.26 \times 10^{-7}$	$2.12 \times 10^{-6}$ ( $2.12 \times 10^{-4}$ )	~0	$2.12 \times 10^{-6}$ ( $2.12 \times 10^{-4}$ )
Hypothetical member of the public at the proposed site boundary	$5.39 \times 10^{-6}$	$1.94 \times 10^{-5}$ ( $1.94 \times 10^{-3}$ )	0.014 <sup>a</sup> (1.4)	0.014 (1.4)
Regulatory limit for individual <sup>b</sup>				0.1 <sup>c</sup> :1 (10:100)

<sup>a</sup> Source: AES, 2010a.

<sup>b</sup> Source: 10 CFR Part 20, Subpart D.

<sup>c</sup> Source: 10 CFR 20.1101 (applies to airborne releases only).

- 1
- 2 • design the proposed facility to delay and reduce UF<sub>6</sub> releases inside the buildings in a
- 3 potential fire incident from reaching the outside environment, including automatic shutoff of
- 4 room HVAC systems during a fire event
- 5
- 6 • move UF<sub>6</sub> cylinders only when cool and when UF<sub>6</sub> is in solid form, to minimize the risk of
- 7 inadvertent release due to mishandling
- 8
- 9 • separate uranic compounds and various other heavy metals in waste material generated by
- 10 decontamination of equipment and systems
- 11
- 12 • use liquid and solid waste handling systems and techniques to control wastes and effluent
- 13 concentrations
- 14
- 15 • route process liquid waste to collection tanks and treat through a combination of
- 16 precipitation, evaporation, and ion exchange to remove most of the radioactive material prior
- 17 to a final evaporation step to preclude any liquid effluent release from the proposed facility
- 18
- 19 • to further mitigate radiation dose, implement an ALARA program in addition to routine
- 20 radiological surveys and personnel monitoring
- 21
- 22 The NRC identified the following additional mitigation measure:
- 23
- 24 • store “empty” cylinders with heels in the middle of a storage pad between full tail cylinders to
- 25 reduce external exposure to workers
- 26

1 **4.2.11 Waste Management Impacts**  
2

3 This section describes the analysis and evaluation of the potential impacts of the solid,  
4 hazardous, and radioactive waste management program at the proposed EREF, and includes  
5 impacts resulting from temporary storage, conversion, and disposal of depleted UF<sub>6</sub>. The  
6 impacts of gaseous effluent and wastewater releases are addressed in Sections 4.2.4, 4.2.6,  
7 and 4.2.10 of this EIS. Waste management impacts (not including depleted UF<sub>6</sub>) would be  
8 SMALL due to the low volumes of waste generated by the proposed facility in comparison to the  
9 availability of disposal options and capacity for the various waste streams. Impacts from the  
10 conversion of depleted UF<sub>6</sub> from the proposed EREF at an offsite location would be SMALL.  
11

12 Due to the nature, design, and operation of a gas centrifuge enrichment facility, the generation  
13 of waste materials can be categorized by three distinct facility operations: (1) preconstruction  
14 and construction, which generates typical construction wastes associated with an industrial  
15 facility; (2) enrichment process operations, which generate gaseous, liquid, and solid waste  
16 streams; and (3) generation and temporary storage of depleted UF<sub>6</sub>. Section 4.2.16 of this  
17 chapter discusses decommissioning wastes. Waste materials include low-level radioactive  
18 waste (i.e., depleted UF<sub>6</sub> and material contaminated with UF<sub>6</sub>), designated hazardous materials  
19 (as defined in 40 CFR Part 261), mixed (radioactive and hazardous), and nonhazardous  
20 materials (any other wastes not identified as radioactive or hazardous). Hazardous materials  
21 include any fluids, equipment, and piping contaminated as defined in 40 CFR Part 261 that  
22 would be generated due to preconstruction, construction, operation, and maintenance activities.  
23

24 The handling and disposal of waste materials are governed by various Federal and State  
25 regulations. The proposed EREF waste management program is intended to minimize the  
26 generation of waste through reduction, reuse, or recycling, and includes systems for the  
27 collection, removal, and proper disposal of waste materials (AES, 2010a). This program would  
28 assist in identifying process changes that can be made to reduce or eliminate mixed wastes,  
29 methods to minimize the volume of regulated wastes through segregation of materials, and the  
30 substitution of nonhazardous materials as required under *Resource Conservation and Recovery*  
31 *Act* (RCRA) regulations.  
32

33 **4.2.11.1 Preconstruction and Construction**  
34

35 **Nonhazardous/Nonradioactive Solid Wastes**  
36

37 Solid nonhazardous wastes generated during preconstruction and construction would be very  
38 similar to wastes generated from the construction sites of other industrial facilities. These  
39 wastes would be transported offsite to an approved local landfill (AES, 2010a).  
40

41 Approximately 6116 cubic meters (8000 cubic yards) per year of noncompacted packing  
42 material, paper, and scrap lumber would be generated (AES, 2010a), based largely on  
43 projections for the National Enrichment Facility (NEF) in Lea County, New Mexico (LES, 2005).  
44 In addition, there would also be scrap structural steel, piping, and sheet metal that would not be  
45 expected to pose significant impacts on the surrounding environment because most could be  
46 recycled or directly placed in an offsite landfill.  
47

1 Nonhazardous construction wastes would likely be transported to the Bonneville County Hatch  
 2 Pit for disposal (AES, 2010a). The Hatch Pit is a former gravel mining site that is being  
 3 reclaimed as a landfill. Upon opening in 1999, it was expected to reach capacity within 15 years  
 4 (Bonneville County, 2006). Preconstruction and major construction activities at the proposed  
 5 EREF site would begin in 2010 and last for approximately 8 years. Therefore, the Hatch Pit  
 6 may reach capacity and stop accepting waste during construction of the proposed EREF,  
 7 requiring the identification of an alternate disposal location for construction wastes in Bonneville  
 8 County or a nearby county. Although detailed information on current waste acceptance rates  
 9 are not available, the Bonneville Country Public Works Department has confirmed that a new  
 10 construction and demolition waste disposal site will be permitted when the Hatch Pit nears  
 11 capacity (Bonneville County, 2009).

12  
 13 Impacts from nonhazardous solid waste generation during preconstruction and construction  
 14 would be SMALL due to the available current or future capacity at nearby disposal facilities.

15  
 16 **Hazardous Wastes**

17  
 18 Hazardous wastes (e.g., waste oil, greases, excess paints, and other chemicals) generated  
 19 during preconstruction and facility construction (e.g., due to the maintenance of construction  
 20 equipment and vehicles, painting, and cleaning) would be packaged and shipped offsite to a  
 21 licensed TSD in accordance with Federal and State environmental and occupational  
 22 regulations (AES, 2010a). The local TSD is the U.S. Ecology facility near Grandview, Idaho,  
 23 which is permitted to receive at least 4.5 million cubic meters (5.9 million cubic yards) of  
 24 hazardous waste (AES, 2010a). Table 4-26 shows the hazardous wastes that would be  
 25 expected from preconstruction and construction of the proposed EREF, which are based largely  
 26 on projections for the NEF in Lea County, New Mexico (LES, 2005). This quantity of hazardous  
 27 waste totals approximately 26 tons and represents less than 0.005 percent of the hazardous  
 28 waste received by the U.S. Ecology facility in 2009 (IDEQ, 2010). The quantity of hazardous  
 29 waste generated during preconstruction and construction would result in SMALL impacts due to  
 30 the available capacity.

31

**Table 4-26 Hazardous Waste Types and Quantities  
 Expected during Preconstruction and Facility Construction**

<b>Waste Type</b>	<b>Annual Quantity</b>
Paints, solvents, thinners, organics	11,360 liters (3000 gallons)
Petroleum products, oils, lubricants	11,360 liters (3000 gallons)
Sulfuric acid (battery)	379 liters (100 gallons)
Adhesives, resins, sealers, caulking	910 kilograms (2000 pounds)
Lead (batteries)	91 kilograms (200 pounds)
Pesticides	379 liters (100 gallons)

Source: AES, 2010a.

32

33

1 **Stormwater**

2  
3 As discussed in Section 4.2.6 (Water Resources Impacts), stormwater runoff during  
4 preconstruction and construction would be collected in a stormwater detention basin that would  
5 allow the water to evaporate or infiltrate the ground surface (with allowance for overflow runoff  
6 to downgradient terrain).

7  
8 Due to the types of activities performed and the types of wastes generated during  
9 preconstruction and construction, the relative contributions to waste impacts are estimated to be  
10 10 percent for preconstruction and 90 percent for construction.

11  
12 **4.2.11.2 Facility Operation**

13  
14 Gaseous effluents, liquid effluents, and solid wastes containing nonhazardous/nonradioactive,  
15 hazardous, and/or radioactive, and/or mixed waste materials would be generated onsite during  
16 normal operation of the proposed EREF. Appropriate treatment systems would be established  
17 to control releases or collect hazardous materials for onsite treatment or shipment offsite  
18 (AES, 2010a). Waste generation would be minimized, liquid wastes would be treated onsite,  
19 and solid wastes would be appropriately packaged and shipped offsite for further processing or  
20 final disposition (AES, 2010a). The impacts from gaseous and liquid effluents are described in  
21 Sections 4.2.4, 4.2.6, and 4.2.10. This section presents the onsite and offsite impacts from the  
22 management of solid and liquid wastes.

23  
24 **Solid Wastes**

25  
26 The operation of the proposed EREF would generate approximately 75,369 kilograms  
27 (165,812 pounds) of solid nonradioactive waste annually, including approximately  
28 5062 kilograms (11,136 pounds) of hazardous wastes (AES, 2010a). Approximately  
29 146,500 kilograms (322,300 pounds) of radiological and mixed waste would be generated  
30 annually, of which approximately 100 kilograms (220 pounds) would be mixed waste  
31 (AES, 2010a). The types and quantities of radioactive and mixed waste are shown in  
32 Table 4-27.

33  
34 Solid wastes generated during operations would be segregated and processed based on  
35 whether the material could be classified as wet solid or dry solid wastes and segregated into  
36 industrial (nonhazardous/nonradioactive), radioactive, hazardous, or mixed-waste categories.

37  
38 Radioactive solid wastes would be Class A low-level radioactive wastes as defined in 10 CFR  
39 Part 61, packaged per DOT standards, and shipped to a licensed commercial low-level  
40 radioactive waste disposal facility or for further processing for volume reduction (AES, 2010a).  
41 Wet solid radioactive waste would include uranic waste precipitate from the liquid waste  
42 treatment process (AES, 2010a) (see Section 4.2.6). In its most recent analysis of low-level  
43 radioactive waste disposal capacity, the U.S. Government Accountability Office (GAO)  
44 concluded that the availability of disposal capacity in the United States for Class A low-level  
45 radioactive waste is not considered to be a problem for the short or long term (GAO, 2004,  
46 2007). Therefore, the impact of low-level radioactive waste generation would be SMALL on  
47 disposal facilities. Management of depleted UF<sub>6</sub> is discussed later in this section.

**Table 4-27 Radiological and Mixed Waste Types and Quantities Expected during Facility Operation**

Waste Type	Annual Quantity kg (lb)	Uranium Content kg (lb)
Activated carbon	600 (1323)	50 (110)
Activated alumina	4320 (9524)	4.4 (9.7)
Perfluoropolyether oil	2054 (4528)	10 (22)
Liquid waste treatment sludge <sup>a</sup>	2086 (4599)	114 (251) <sup>b</sup>
Activated sodium fluoride <sup>c</sup>	–	–
Assorted materials (paper, clothing, etc.)	4200 (9262)	60 (132)
Ventilation filters	92,196 (203,259)	11 (24)
Non-metallic components	10,000 (22,050)	Trace <sup>d</sup>
Miscellaneous mixed wastes (organic compounds) <sup>e</sup>	100 (220)	4 (8.8)
Combustible waste	7000 (15,436)	Trace <sup>d</sup>
Scrap metal	24,000 (52,920)	Trace <sup>d</sup>

<sup>a</sup> Sludge and evaporator concentrates.

<sup>b</sup> Value is composed of uranium in the citric acid and degreaser tanks, precipitated aqueous solutions, uranium in precipitated laboratory/miscellaneous effluents, and uranium in sludge from the citric acid and degreaser tanks.

<sup>c</sup> No wastes are produced on an annual basis. Sodium fluoride traps are not expected to saturate over the life of the plant.

<sup>d</sup> Not detectable above naturally occurring background concentrations.

<sup>e</sup> Representative organic compounds consist of acetone, toluene, ethanol, and petroleum ether.

Source: AES, 2010a.

1  
2 As described in Sections 2.1.4.2 and 4.2.4.3, gaseous effluent from the GEVSs would pass  
3 through a pre-filter (to capture dust and other particulates), two sets of HEPA filters (to capture  
4 uranium particulates and aerosols), and an activated carbon filter (to capture HF). Similar filters  
5 would be used in the Centrifuge Test and Postmortem Facilities Exhaust Filtration System.  
6 After loaded filters are removed from service, they would be bagged to prevent the spread of  
7 contamination, sampled for <sup>235</sup>U content, and packaged for storage and eventual shipment to a  
8 volume reduction facility or low-level waste disposal facility (AES, 2010a).  
9

10 Hazardous wastes (e.g., solvents, hydrocarbon sludge, chemicals, and empty hazardous  
11 material containers) generated at the proposed EREF would be collected at the point of  
12 generation, classified, packaged, and shipped offsite to a licensed TSDf in accordance with  
13 Federal and State environmental and occupational regulations. Hazardous wastes would not be  
14 treated, stored, or disposed of at the proposed EREF in a manner that requires a RCRA permit  
15 (AES, 2010a). The annual quantity of hazardous waste that would be generated by the  
16 proposed EREF represents approximately 0.001 percent of the hazardous waste received by  
17 the U.S. Ecology facility in 2009 (IDEQ, 2010). EPA and Idaho regulations, including the Idaho



1 Standards for Hazardous Waste (IAC, 2008), would guide the management of hazardous  
2 wastes (AES, 2010a).

3  
4 Mixed wastes that can be processed to meet land disposal requirements would be treated,  
5 packaged per DOT requirements, and shipped to a licensed commercial low-level radioactive  
6 waste disposal facility (AES, 2010a). Other mixed wastes would be collected, packaged per  
7 DOT standards, and shipped to a licensed commercial TSDf (such as the EnergySolutions  
8 facilities in Clive, Utah or Oak Ridge, Tennessee). Mixed wastes would not be treated, stored,  
9 or disposed of at the proposed EREF in a manner that requires a RCRA permit (AES, 2010a).  
10 Due to the small quantity of mixed waste that would be generated, the impact of mixed waste  
11 generation would be SMALL on disposal facilities.

12  
13 The annual volume of industrial wastes generated at the proposed EREF would require  
14 approximately 181 shipments per year to a local landfill for disposal (AES, 2010a). The  
15 Peterson Hill Landfill is Bonneville County's sole municipal landfill, accepting between  
16 58,960 and 68,040 metric tons (65,000 and 75,000 tons) of waste annually. Based on current  
17 waste generation rates and service population, Bonneville County expects the landfill to have a  
18 lifetime of 130 years, which would adequately encompass the operating lifetime of the proposed  
19 EREF (AES, 2010a; Bonneville County, 2009). Based on the estimate of waste accepted by the  
20 landfill in 2007, industrial solid waste generation from operation of the proposed EREF would  
21 increase the volume of wastes impounded at the landfill by less than 0.1 percent. Based on the  
22 quantities of solid wastes generated, the application of industry-accepted procedures, and the  
23 availability of capacity at regional disposal facilities, the impacts from solid wastes generated  
24 during operation would be SMALL.

## 25 26 **Liquid Wastes**

27  
28 As noted in Section 4.2.6.2, there would be no discharge of liquid effluents to surface water or  
29 groundwater during facility operation, and water quality impacts from facility operations are  
30 expected to be SMALL.

31  
32 Liquid waste streams from facility operations would be processed by the Liquid Effluent  
33 Collection and Treatment System and would include laboratory effluent, degreaser water, citric  
34 acid, floor washings, miscellaneous condensates, and emergency hand washing and shower  
35 water from radiation areas. Most of these waste streams would be collected in the  
36 Miscellaneous Effluent Collection Tank, and some wastes (such as floor washings) would be  
37 sampled for uranic content prior to collection in the tank. Waste in this tank would be sampled  
38 for uranic content, treated by filtration and precipitation (if necessary), and vaporized in the  
39 Liquid Effluent Treatment System Evaporator to produce a chemically decontaminated gaseous  
40 effluent (see Section 4.2.10.2) (AES, 2010a).

41  
42 Effluents containing uranium would be treated with potassium hydroxide to precipitate uranium  
43 and other precipitating agents (such as lime) to precipitate fluoride. Treated effluents would be  
44 sampled for uranium and fluoride content, and microfiltration and precipitation cycles would be  
45 repeated, as necessary. Uranium precipitate and calcium fluoride sludge would be removed by  
46 filtration and disposed of as low-level radioactive waste. Effluents meeting regulatory release  
47 levels for uranium and fluorine would be sent to the Liquid Effluent Treatment System

1 Evaporator. A small volume of liquid evaporator concentrate would be periodically removed,  
2 analyzed for uranium content, and disposed of as low-level radioactive waste (AES, 2010a).

3  
4 The proposed EREF would not be connected to a publicly operated treatment works (POTW).  
5 All domestic sanitary sewage would be treated onsite to comply with 10 CFR 20.2003 and  
6 collected in the cylinder storage pad stormwater retention basins for evaporation to the  
7 atmosphere (AES, 2010a).

8  
9 Stormwater runoff during facility operations would be collected in a Site Stormwater Detention  
10 Basin that would allow the water to evaporate or infiltrate the ground surface (with allowance for  
11 overflow runoff to downgradient terrain). Because this basin would only receive runoff from  
12 paved surfaces (not including the Cylinder Storage Pads), building roofs, and landscaped areas,  
13 no uranic content would be expected. Stormwater runoff from the Cylinder Storage Pads would  
14 be collected in two lined Cylinder Storage Pads Stormwater Retention Basins and allowed to  
15 evaporate. Because these basins would not receive process-related effluents, the only potential  
16 sources of radiological contamination would be residual contamination on the exterior of a  
17 cylinder or the accidental release of UF<sub>6</sub> from a leaking cylinder or handling accident.  
18 Therefore, no significant releases of uranic material to these basins would be expected (AES,  
19 2010a). Although all three basins would not receive process-related effluents and would not be  
20 expected to contain uranium or hazardous constituents from other sources, stormwater and  
21 sediment from all three basins would be sampled quarterly as a part of the site environmental  
22 measurement and monitoring program (as described in Chapter 6).

### 23 24 **Depleted UF<sub>6</sub> Waste Management**

25  
26 The proposed EREF is expected to generate 1222 cylinders of depleted UF<sub>6</sub> annually (AES,  
27 2010a). As discussed in Section 2.1.3 of this EIS, until a conversion facility is available,  
28 depleted UF<sub>6</sub>-filled Type 48Y cylinders would be temporarily stored on an outdoor Cylinder  
29 Storage Pad. Storage of depleted UF<sub>6</sub> cylinders at the proposed EREF would occur for the  
30 duration of the facility's 30-year operating lifetime and before final removal of depleted UF<sub>6</sub> from  
31 the proposed EREF site (AES, 2010a). However, AES has stated that depleted UF<sub>6</sub> cylinders  
32 would not be stored at the proposed EREF site beyond the facility's licensed lifetime (AES,  
33 2010a).

34  
35 The proposed EREF's Full Tails Cylinder Storage Pads are currently designed to accommodate  
36 up to 33,638 depleted UF<sub>6</sub> cylinders (AES, 2010a), which provide storage capacity for the  
37 expected lifetime generation of the facility in the event that a DOE conversion facility should be  
38 unavailable or delayed.

### 39 40 **Temporary Depleted UF<sub>6</sub> Storage Impacts**

41  
42 Proper and active depleted UF<sub>6</sub> cylinder management, which includes routine inspections and  
43 maintaining the anticorrosion layer on the cylinder surface, has been shown to limit exterior  
44 corrosion or mechanical damage necessary for safe storage (DNFSB, 1995a,b, 1999). DOE  
45 has stored depleted UF<sub>6</sub> in Type 48Y or similar cylinders at the Paducah and Portsmouth  
46 Gaseous Diffusion Plants and the East Tennessee Technical Park in Oak Ridge, Tennessee,  
47 since the mid-1950s, and cylinder leaks due to corrosion led DOE to implement a cylinder  
48 management program (Biwer et al., 2001). Past evaluations and monitoring by the Defense

1 Nuclear Facility Safety Board (DNFSB) of DOE's cylinder maintenance program confirmed that  
2 DOE met all of the commitments in its cylinder maintenance implementation plan, particularly  
3 through the use of a systems engineering process to develop a workable and technically  
4 justifiable cylinder management program (DNFSB, 1999). AES intends to implement a similar  
5 cylinder management program at the proposed EREF (AES, 2010a), as a properly implemented  
6 cylinder maintenance program would assure the integrity of the depleted UF<sub>6</sub> cylinders for  
7 temporary onsite storage of depleted UF<sub>6</sub> on the Cylinder Storage Pads.  
8

9 The principal impacts from temporary storage of depleted UF<sub>6</sub> would be the radiological  
10 exposure from an increasing quantity of depleted UF<sub>6</sub> temporarily stored in cylinders on the Full  
11 Tails Cylinder Storage Pad (up to the design capacity of 33,638 cylinders at the end of the  
12 facility's operating lifetime) under normal conditions and the potential release (slow or rapid) of  
13 depleted UF<sub>6</sub> from the depleted UF<sub>6</sub> cylinders due to an off-normal event or accidents  
14 (operational, external, or natural hazard phenomena events). These radiation exposure  
15 pathways are analyzed in Section 4.2.10, and based on these results, the impacts from  
16 temporary storage of depleted UF<sub>6</sub> would be SMALL. The annual impacts from temporary  
17 storage would continue until the depleted UF<sub>6</sub> cylinders are removed from the proposed EREF  
18 site.  
19

### 20 **Offsite Disposal Impacts**

21  
22 For the offsite disposal of the depleted UF<sub>6</sub>, AES has proposed that the Type 48Y cylinders  
23 would be transported to either of the DOE's conversion facilities at Paducah, Kentucky, or  
24 Portsmouth, Ohio, for conversion to triuranium octaoxide (U<sub>3</sub>O<sub>8</sub>) (AES, 2010a). Following  
25 conversion, the U<sub>3</sub>O<sub>8</sub> would be stored for potential future use or transported to a licensed  
26 disposal facility (DOE, 2004a,b). The transportation of the Type 48Y cylinders from the  
27 proposed EREF to either of the conversion facilities would have environmental impacts that are  
28 included in the transportation analysis presented in Section 4.2.9.2.  
29

30 If the DOE conversion facility could not immediately process the depleted UF<sub>6</sub> cylinders upon  
31 arrival, potential impacts would include radiological impacts proportional to the time of  
32 temporary storage at the conversion facility. DOE has previously assessed the impacts of  
33 depleted UF<sub>6</sub> cylinder storage during the operation of a depleted UF<sub>6</sub> conversion facility  
34 (DOE, 2004a,b), which bounds the impacts of temporary storage of EREF-originated depleted  
35 UF<sub>6</sub> cylinders at the conversion facility site. At the Paducah and Portsmouth conversion  
36 facilities, the maximum collective dose to workers (i.e., workers at the cylinder yards) would be  
37 0.055 person-sieverts (5.5 person-rem) per year and 0.03 person-sievert (3 person-rem) per  
38 year, respectively considering the existing stored inventories of depleted UF<sub>6</sub> (DOE, 2004a,b).  
39 There would be negligible exposure to noninvolved workers or the public due to their distance  
40 from the cylinder yards and because air emissions from the cylinder preparation and  
41 maintenance activities would be negligible (DOE, 2004a,b).  
42

43 The Paducah conversion facility would operate for approximately 25 years to process the  
44 436,400 metric tons (481,000 tons) that were in storage prior to anticipated startup of the  
45 conversion facility in 2006 (DOE, 2004a). Similarly, the Portsmouth conversion facility would  
46 operate for 18 years to process 243,000 metric tons (268,000 tons) (DOE, 2004b). The  
47 projected lifetime production of depleted UF<sub>6</sub> by the proposed EREF (321,235 metric tons  
48 [354,101 tons]) would represent approximately 74 percent and 132 percent of the initial

1 Paducah and Portsmouth inventories, respectively. The proposed EREF would produce (and  
2 provide for conversion) approximately 7635 metric tons (8418 tons) of depleted UF<sub>6</sub> per year at  
3 full production capacity (AES, 2010a), which represents approximately 47 percent of the annual  
4 conversion capacity of the Paducah facility (18,000 metric tons [20,000 tons]) and approximately  
5 62 percent of the annual conversion capacity of the Portsmouth facility (13,500 metric tons  
6 [15,000 tons]). The proposed EREF's projected lifetime production of depleted UF<sub>6</sub> inventory, if  
7 processed by either the Paducah or Portsmouth conversion facility, could extend the potential  
8 duration of conversion facility operation by approximately 18 years or 24 years, respectively.  
9

10 With routine facility and equipment maintenance, and periodic equipment replacements or  
11 upgrades, DOE indicated that the Paducah and Portsmouth conversion facilities could be  
12 operated safely beyond their proposed operational lifetimes to process the depleted UF<sub>6</sub> such  
13 as that originating at the proposed EREF (DOE, 2004a,b). In addition, DOE indicated the  
14 estimated impacts that would occur from prior conversion facility operations would remain the  
15 same when processing depleted UF<sub>6</sub> such as the proposed EREF wastes (DOE, 2004a,b). The  
16 overall cumulative impacts from the operation of a DOE conversion facility would increase  
17 proportionately with the increased life of the facility (DOE, 2004a,b).  
18

19 Additional conversion processing capacity could also be achieved through increased efficiency  
20 of the Paducah and Portsmouth conversion plants and the possibility of a commercial  
21 conversion plant being constructed. International Isotopes, Inc. submitted a license application  
22 to the NRC on December 31, 2009, to construct and operate a depleted UF<sub>6</sub> conversion facility  
23 near Hobbs, New Mexico (the NRC staff is currently conducting environmental and safety  
24 reviews of the application) (NRC, 2010d).  
25

26 To meet the increased demand for enriched uranium, as discussed in Section 1.3.1, three other  
27 uranium enrichment facilities are planned or under construction. These facilities would also  
28 generate depleted UF<sub>6</sub>, in addition to the currently operating gaseous diffusion enrichment plant  
29 at Paducah, that would also require conversion and disposal. Should all of the facilities become  
30 operational, extended storage times for the depleted UF<sub>6</sub> cylinders at conversion facilities may  
31 be necessary and could result in the need for an additional conversion facility.  
32

33 The above assumptions and data indicate that environmental impacts from the conversion of  
34 depleted UF<sub>6</sub> from the proposed EREF at an offsite location such as Portsmouth or Paducah  
35 would be SMALL.  
36

37 The impacts from transportation of U<sub>3</sub>O<sub>8</sub> (from the conversion of depleted UF<sub>6</sub>) to potential  
38 disposal sites have been previously evaluated for the depleted UF<sub>6</sub> stored at the Paducah and  
39 Portsmouth sites (DOE, 2004a,b). Transportation impacts relating to the shipment of EREF-  
40 originated U<sub>3</sub>O<sub>8</sub> from the DOE conversion facilities to a potential disposal site would be SMALL.  
41

#### 42 **4.2.11.3 Mitigation Measures**

43 Measures identified by AES to mitigate waste management impacts during preconstruction  
44 activities, construction, and facility operation include (AES, 2010a):  
45

- 46 • develop a construction phase recycling program  
47  
48

- 1 • design system features to minimize the generation of solid waste, liquid waste, and gaseous  
2 effluent (gaseous effluent design features are described above under Public and  
3 Occupational Health)
- 4
- 5 • store waste in designated areas of the facility until an administrative limit is reached, then  
6 ship offsite to a licensed disposal facility; no disposal of waste onsite
- 7
- 8 • dispose of all radioactive and mixed wastes at offsite licensed facilities
- 9
- 10 • maintain a cylinder management program to monitor storage conditions on the Full Tails  
11 Cylinder Storage Pads, to monitor cylinder integrity by conducting routine inspections for  
12 breaches and to perform cylinder maintenance and repairs as needed
- 13
- 14 • store all tails cylinders filled with depleted UF<sub>6</sub> on saddles of concrete, or other suitable  
15 material, that do not cause corrosion of the cylinders; place saddles on a concrete pad
- 16
- 17 • segregate the storage pad areas from the rest of the enrichment facility by barriers, such as  
18 vehicle guard rails
- 19
- 20 • double-stack depleted uranium tails cylinders on the storage pad, arrayed to permit easy  
21 visual inspection of all cylinders
- 22
- 23 • survey depleted uranium tails cylinders for external contamination (wipe test) prior to being  
24 placed on a Full Tails Cylinder Storage Pad or transported offsite
- 25
- 26 • fit depleted uranium tails cylinder valves with valve guards to protect the cylinder valves  
27 during transfer and storage
- 28
- 29 • make provisions to ensure that depleted uranium tails cylinders will not have defective  
30 valves (identified in NRC Bulletin 2003-03, "Potentially Defective 1-inch Valves for Uranium  
31 Hexafluoride Cylinders") (NRC, 2003c) installed
- 32
- 33 • perform touch-up application of paint coating on depleted uranium tails cylinders if coating  
34 damage is discovered during inspection (UF<sub>6</sub> cylinder manufacturing will include abrasive  
35 blasting and coating with anticorrosion primer/paint, as required by specification)
- 36
- 37 • allow only designated vehicles, operated by trained and qualified personnel, on the Full Tails  
38 Cylinder Storage Pads, Full Feed Cylinder Storage Pads, Full Product Cylinder Storage  
39 Pad, and the Empty Cylinder Storage Pad (refer to the Integrated Safety Analysis [ISA]  
40 Summary, Section 3.8, for controls associated with vehicle fires on or near the Cylinder  
41 Storage Pads)
- 42
- 43 • inspect depleted uranium tails cylinders for damage prior to placing a filled cylinder on a  
44 storage pad. Annually reinspect depleted uranium tails cylinders for damage or surface  
45 coating defects. These inspections will verify that:
  - 46 – lifting points are free from distortion and cracking
  - 47 – cylinder skirts and stiffener rings are free from distortion and cracking
  - 48 – cylinder surfaces are free from bulges, dents, gouges, cracks, or significant corrosion



- 1     – cylinder valves are fitted with the correct protector and cap
- 2     – cylinders are inspected to confirm that the valve is straight and not distorted, two to six
- 3         threads are visible, and the square head of the valve stem is undamaged
- 4     – cylinder plugs are undamaged and not leaking
- 5
- 6     • if inspection of a depleted uranium tails cylinder reveals significant deterioration or other
- 7         conditions that may affect the safe use of the cylinder, transfer the contents of the affected
- 8         cylinder to another cylinder in good condition and discard the defective cylinder; determine
- 9         the root cause of any significant deterioration and, if necessary, make additional inspections
- 10        of cylinders
- 11
- 12    • make available onsite proper documentation on the status of each depleted uranium tails
- 13        cylinder, including content and inspection dates
- 14
- 15    • use the lined Cylinder Storage Pads Stormwater Retention Basins to capture stormwater
- 16        runoff from the Full Tails Cylinder Storage Pads
- 17
- 18    • minimize power usage by efficient design of lighting systems, selection of high-efficiency
- 19        motors, and use of proper insulation materials
- 20
- 21    • control process effluents by means of the following liquid and solid waste handling systems
- 22        and techniques:
  - 23        – follow careful application of basic principles for waste handling in all of the systems and
  - 24            processes
  - 25        – collect different waste types in separate containers to minimize contamination of one
  - 26            waste type with another; carefully package materials that can cause airborne
  - 27            contamination; provide ventilation and filtration of the air in the area as necessary;
  - 28            confine liquid wastes to piping, tanks, and other containers; use curbing, pits, and sumps
  - 29            to collect and contain leaks and spills
  - 30        – store hazardous wastes in designated areas in carefully labeled containers; also contain
  - 31            and store mixed wastes separately
  - 32        – neutralize strong acids and caustics before they enter an effluent stream
  - 33        – decontaminate and/or reuse radioactively contaminated wastes to reduce waste volume
  - 34            as far as possible
  - 35        – reduce the volume of collected waste such as trash, compressible dry waste, scrap
  - 36            metals, and other candidate wastes at a centralized waste processing facility
  - 37        – include administrative procedures and practices in waste management systems that
  - 38            provide for the collection, temporary storage, processing, and disposal of categorized
  - 39            solid waste in accordance with regulatory requirements
  - 40        – design handling and treatment processes to limit wastes and effluent; perform sampling
  - 41            and monitoring to assure that plant administrative and regulatory limits will not be
  - 42            exceeded
  - 43        – monitor gaseous effluent for HF and radioactive contamination before release
  - 44        – sample and/or monitor liquid wastes in liquid waste treatment systems
  - 45        – sample and/or monitor solid wastes prior to offsite treatment and disposal
  - 46        – return process system samples to their source, where feasible, to minimize input to
  - 47            waste streams
- 48

- 1 • implement a spill control program for accidental oil spills; prepare a Spill Prevention Control  
2 and Countermeasure (SPCC) Plan prior to the start of operation of the facility or prior to the  
3 storage of oil on the proposed site in excess of *de minimis* quantities, which will contain the  
4 following information:
  - 5 – identification of potential significant sources of spills and a prediction of the direction and  
6 quantity of flow that will likely result from a spill from each source
  - 7 – identification of the use of containment or diversionary structures such as dikes, berms,  
8 culverts, booms, sumps, and diversion ponds, at the facility to control discharged oil
  - 9 – procedures for inspection of potential sources of spills and spill containment/diversion  
10 structures
  - 11 – assigned responsibilities for implementing the plan, inspections, and reporting
  - 12 – as part of the SPCC Plan, other measures will include control of drainage of rain water  
13 from diked areas, containment of oil and diesel fuel in bulk storage tanks, aboveground  
14 tank integrity testing, and oil and diesel fuel transfer operational safeguards
- 15
- 16 • implement a nonhazardous materials waste recycling plan during operation; perform a  
17 waste assessment to identify waste reduction opportunities and to determine which  
18 materials will be recycled; contact brokers and haulers to find an end-market for the  
19 materials; perform employee training on the recycling program so that employees will know  
20 which materials are to be recycled; purchase and clearly label recycling bins and containers;  
21 periodically evaluate the recycling program (i.e., waste management expenses and savings,  
22 recycling and disposal quantities) and report the results to the employees
- 23

#### 24 **4.2.12 Socioeconomic Impacts**

25

26 This section provides an analysis of the socioeconomic impacts associated with  
27 preconstruction, construction, and operation of the proposed EREF. Wage and salary spending  
28 and expenditures associated with materials, equipment, and supplies would produce income  
29 and employment and local and State tax revenue, while the migration of workers and their  
30 families into the area would affect housing availability, area community services such as  
31 schools, education, and law enforcement, and the availability and cost of public utilities such as  
32 electricity, water, sanitary services, and roads. The economic impacts of the proposed EREF  
33 project are evaluated for an 11-county region of influence (ROI) in Idaho – including Bannock,  
34 Bingham, Blaine, Bonneville, Butte, Caribou, Clark, Fremont, Jefferson, Madison, and Power  
35 Counties – which encompasses the area that is expected to be the primary source of labor for  
36 each phase of the proposed project and where workers employed during preconstruction,  
37 construction, and operation of the proposed EREF are expected to live and spend most of their  
38 salary. The 11-county ROI is also the area in which a significant portion of site purchase and  
39 non-payroll expenditures are expected to occur. The majority of the economic impacts of the  
40 proposed facility are expected to occur in two of these counties, Bingham and Bonneville. It is  
41 anticipated that a number of workers will move into the area during each phase of the proposed  
42 project, with the majority of the demographic and social impacts likely to occur in Bingham and  
43 Bonneville Counties. The impacts of the proposed EREF on population, housing, and  
44 community services are assessed for a two-county ROI, consisting of Bingham and Bonneville  
45 Counties. The impacts of preconstruction, construction, and facility operation would be SMALL.

46

47

1 **4.2.12.1 Methodology**  
2

3 This analysis of socioeconomic impacts includes impacts on employment, income, State tax  
4 revenues, population, housing, and community and social services.  
5

6 Employment impacts are evaluated by estimating the level of direct and indirect employment  
7 associated with the proposed facility. Direct employment is created by preconstruction and  
8 construction activities and facility operations, while indirect employment is created in the  
9 11-county ROI to support the needs of the workers directly employed by the proposed EREF  
10 and jobs created to support site purchase and non-payroll expenditures. The number of direct  
11 jobs created in each stage is estimated based on anticipated labor inputs for various  
12 engineering and construction activities. Indirect employment is estimated using economic  
13 multipliers from the RIMS-II input-output model, developed by the U.S. Bureau for Economic  
14 Analysis (BEA, 2010), which accounts for inter-industry relationships within regions.  
15

16 State income tax revenue impacts are estimated by applying State income tax rates to project-  
17 related construction and operations earnings. State and local sales tax revenues are estimated  
18 by applying appropriate State and local sales tax rates to after-tax income generated by  
19 construction and operations employees, spent within the 11-county ROI. Impacts on population  
20 characteristics are evaluated by estimating the fraction of direct and indirect jobs that would be  
21 filled by in-migrating workers from outside the two-county ROI. The average family size and  
22 age profiles of in-migrating families are estimated using appropriate demographic assumptions  
23 based on U.S. Census Bureau statistics. Impacts on area housing resources are estimated by  
24 comparing rental and owner-occupied vacancy statistics with estimated population in-migration  
25 into the two-county ROI during the preconstruction, construction, and operations phases of the  
26 proposed project.  
27

28 Impacts on community and social services are assessed by estimating the number of additional  
29 local community service employees that would be required to maintain existing levels of service  
30 of education, law enforcement, and fire services, given the number of in-migrating workers  
31 expected into the two-county ROI during the various phases of the proposed project. Although  
32 Bingham and Bonneville Counties are expected to be the primary sources of labor for the  
33 proposed EREF, some labor in-migration is expected during each phase of the proposed  
34 project. The number of in-migrating workers used in the analysis was assumed to be small, with  
35 the majority of craft skills available in the two-county ROI. Sixty-five percent of in-migrating  
36 workers were assumed to be accompanied by their families, which would consist of an  
37 additional adult and one school-age child (AES, 2010a).  
38

39 There are large differences between the indirect (offsite) impact of the proposed EREF during  
40 the operations phase and during other phases of the proposed project. These differences are  
41 due to the relatively minor role in the economy of the 11-county ROI of suppliers of capital  
42 equipment, materials, and services provided to the proposed project during construction,  
43 compared to other phases of the proposed project, particularly operations (AES, 2010a).  
44

45 As no detailed data on the preconstruction share of total construction employment or total  
46 construction expenditures were available for the proposed EREF, payroll expenditure data  
47 provided for the proposed Global Laser Enrichment, (GLE) Facility in North Carolina  
48 (GLE, 2009) were used as a basis for estimating the impacts of preconstruction and

1 construction activities for the proposed EREF. The proposed GLE Facility is another proposed  
2 nuclear fuel fabrication facility, with proposed preconstruction activities similar in nature, and on  
3 a similar scale, to those for the proposed EREF. Income data for Idaho Falls, Idaho, are  
4 estimated using data presented in the AES Environmental Report (AES, 2010a). Based on this  
5 information, preconstruction activities at the proposed EREF would contribute 5 percent of the  
6 impacts during the preconstruction period (2010–2011), and construction activities would  
7 contribute 95 percent (2012–2022).

8  
9 Impacts for each phase of the proposed project are summarized in Table 4-28, and are based  
10 on data provided in the AES Environmental Report (AES, 2010a). These impacts are discussed  
11 in the following sections. The NRC has reviewed and verified the data and methodology.

## 12 13 **4.2.12.2 Preconstruction and Construction**

### 14 15 **Preconstruction**

16  
17 Preconstruction activities in 2010–2011 would create 108 direct jobs at the proposed EREF site  
18 (AES, 2010a). An additional 200 indirect jobs would be created in the 11-county ROI with the  
19 procurement of material and equipment and the spending of direct worker wages and salaries  
20 (Table 4-28). Preconstruction would produce \$4.4 million in income in the 11-county ROI.  
21 Preconstruction would produce \$0.1 million in direct State income taxes and \$0.9 million in  
22 direct State sales taxes (AES, 2010a). Preconstruction activities would constitute less than  
23 1 percent of total two-county ROI employment (see Section 3.12.2); the economic impact of  
24 preconstruction of the proposed EREF would be SMALL.

25  
26 Given the likelihood of a lack of local worker availability in the required occupational categories,  
27 EREF preconstruction would require some in-migration of workers and their families from  
28 outside the two-county ROI, with an estimated 49 persons in-migrating into the two-county ROI  
29 during the peak of preconstruction (AES, 2010a). Although in-migration may potentially impact  
30 local housing markets, the relatively small number of in-migrants and the availability of  
31 temporary accommodation (hotels, motels, and mobile home parks) would mean that the impact  
32 of preconstruction on the number of vacant rental housing units is not expected to be large, with  
33 21 additional rental units being expected to be occupied in the two-county ROI during  
34 preconstruction (AES, 2010a). These occupancy rates would represent less than 0.1 percent of  
35 the vacant rental units expected to be available in the two-county ROI during preconstruction;  
36 the impact of EREF preconstruction on housing would, therefore, be SMALL.

37  
38 In addition to the potential impact on housing markets, in-migration would also affect local  
39 community and educational services employment to maintain existing levels of service in the  
40 two-county ROI. Accordingly, less than one additional police officer and less than one  
41 additional firefighter would be required during the preconstruction period (AES, 2010a).  
42 Assuming that a certain number of workers are accompanied by their families during  
43 preconstruction, 14 additional school-age children would be expected in the two-county ROI  
44 during the preconstruction period, meaning that one additional teacher would be required to  
45 maintain existing student–teacher ratios in the local school system (AES, 2010a). These  
46 staffing increases would represent less than 0.1 percent of community service employment in  
47 each employment category expected in the two-county ROI; the impact of EREF  
48 preconstruction on community and educational services employment would be SMALL.

**Table 4-28 Socioeconomic Effects of the Proposed EREF<sup>a</sup>**

Parameter	Preconstruction	Peak Facility Construction	Construction-Operations Overlap Period	Operations
Employment (number of jobs)				
Direct	108	590	275	550
Indirect	200	1097	1370	2739
Total	308	1687	1645	3289
Income (\$m 2008 \$)				
Direct	4.4	23.9	14.1	28.2
Indirect	7.5	41.2	32.1	64.2
Total	11.9	65.0	46.2	92.4
Tax Revenues				
Income Taxes (\$m 2008 \$)	0.1	0.7	0.7	1.3
Sales and use Taxes (\$m 2008 \$)	0.9	5.1	NA <sup>b</sup>	NA
Property Taxes (\$m 2008 \$)	NA	NA	1.8	3.5
Population (number of new residents)	49	266	124	199
Housing (number of units required)	21	112	52	87
Public Service Employment (number of new employees)				
Police officers	<1	<1	<1	<1
Firefighters	<1	<1	<1	<1
Teachers	1	4	2	3

<sup>a</sup> Impacts are shown for preconstruction (2011), the peak year of construction (2012), the first year of start-up (2014) and the first year of operations (2022). Employment, income and tax impacts are estimated for the 11-county ROI; population, housing and public service employment impacts are estimated for the two-county ROI.

<sup>b</sup> NA = not applicable.

Sources: AES, 2010a; direct preconstruction figures based on information in GLE, 2009.

**Facility Construction**

Construction activities in the peak year (2012) would create 590 direct jobs at the proposed EREF site (AES, 2010a). An additional 1097 indirect jobs would be created in the 11-county ROI with the procurement of material and equipment and the spending of direct worker wages and salaries (Table 4-28). Facility construction would produce \$65.0 million in income in the 11-county ROI in 2012. Construction would produce \$0.7 million in direct State income taxes and \$5.1 million in direct State sales taxes (AES, 2010a). Peak year construction activities would constitute less than 1 percent of total two-county ROI employment in 2012



1 (see Section 3.12.2); the economic impact of constructing the proposed EREF would be  
2 SMALL.

3  
4 Given the scale of construction activities and the likelihood of local worker availability in the  
5 required occupational categories, EREF construction would mean that some in-migration of  
6 workers and their families from outside the two-county ROI would be required, with 266 persons  
7 in-migrating into the two-county ROI during the peak year of construction (AES, 2010a).  
8 Although in-migration may potentially impact local housing markets, the relatively small number  
9 of in-migrants and the availability of temporary accommodation (hotels, motels, and mobile  
10 home parks) would mean that the impact of facility construction on the number of vacant rental  
11 housing units is not expected to be large, with 112 additional rental units expected to be  
12 occupied in the two-county ROI during construction (AES, 2010a). These occupancy rates  
13 would represent less than 0.1 percent of the vacant rental units expected to be available in the  
14 two-county ROI in 2012; the impact of EREF construction on housing would be SMALL.

15  
16 In addition to the potential impact on housing markets, in-migration would also affect local  
17 community and educational services employment to maintain existing levels of service in the  
18 two-county ROI. Accordingly, less than one police officer and less than one firefighter would be  
19 required in the peak construction year, 2012 (AES, 2010a). During construction, 76 additional  
20 school-age children would be expected in the two-county ROI in 2012, meaning four additional  
21 teachers would be required to maintain existing student–teacher ratios in the local school  
22 system (AES, 2010a). These staffing increases would represent less than 0.1 percent of  
23 community service employment in each employment category expected in the two-county ROI  
24 in 2012; the impact of EREF construction on community and educational service employment  
25 would be SMALL.

## 26 27 **4.2.12.3 Facility Operation**

### 28 29 **Facility Construction/Operations Startup Overlap Period**

30  
31 Full production at the proposed EREF would not occur until 2022 when final construction would  
32 be completed. However, limited production of enriched uranium would begin with the opening  
33 of the first cascade in 2014 because of the modular nature of the proposed EREF. Enriched  
34 uranium production would increase and heavy construction would continue until 2018 when all  
35 major building structures would be completed and SBMs 1 and 2 would be fully operational.  
36 During this period, construction employment is expected to decline from levels reached in the  
37 peak construction year (2012) and startup employment would likely remain at the level  
38 established in 2014 until full facility operation commences in 2022 with the completion of the  
39 cascades in SBM 4 (AES, 2010a).

40  
41 Startup activities in the first year (2014) would create 275 direct jobs at the proposed EREF  
42 (AES, 2010a). An additional 1370 indirect jobs would be created in the 11-county ROI with the  
43 procurement of material and equipment and the spending of direct worker wages and salaries  
44 (Table 4-28). Facility startup would produce \$46.2 million in income in the 11-county ROI in  
45 2014 and \$0.7 million in direct State income taxes (AES, 2010a). Property taxes payable to  
46 Bonneville County would amount to \$1.8 million annually between 2015 and 2017. Startup  
47 activities would constitute less than 1 percent of total two-county ROI employment in 2014

1 (see Section 3.12.2); the economic impact during the period of construction/operations overlap  
2 of the proposed EREF would be SMALL.

3  
4 Given the scale of startup activities and the likelihood of local worker availability in the required  
5 occupational categories, startup of the proposed EREF would result in some in-migration of  
6 workers and their families from outside the two-county ROI, with 124 persons in-migrating into  
7 the two-county ROI during the first year of startup (AES, 2010a). Although in-migration may  
8 potentially impact local housing markets, there would be a relatively small number of  
9 in-migrants, and temporary accommodation (hotels, motels, and mobile home parks) would be  
10 available. Approximately 52 additional rental units would be expected to be occupied in the two-  
11 county ROI during this period (AES, 2010a). These occupancy rates would represent less than  
12 0.1 percent of the vacant rental units expected to be available in the two-county ROI in 2014;  
13 therefore, the impact of the proposed EREF project on housing during the  
14 construction/operations overlap period would be SMALL.

15  
16 In addition, in-migration would also affect local community and educational services  
17 employment to maintain existing levels of service in the two-county ROI. Accordingly, less than  
18 one police officer and less than one firefighter would be required in the first year, 2014, when  
19 operations begin. During startup, 35 additional school-age children would be expected in the  
20 two-county ROI in 2014, meaning two additional teachers would be required to maintain existing  
21 student-teacher ratios in the local school system (AES, 2010a). These staffing increases would  
22 represent less than 0.1 percent of community service employment in each employment category  
23 expected in the two-county ROI in 2012; therefore, the impact of the proposed EREF project on  
24 community and educational service employment during the construction/operations overlap  
25 period would be SMALL.

### 26 27 **Full Operation**

28  
29 Operations activities in the first full year (2022) would create 550 direct jobs at the proposed  
30 EREF site itself (AES, 2010a). An additional 2739 indirect jobs would be created in the  
31 11-county ROI with the procurement of material and equipment and the spending of direct  
32 worker wages and salaries (Table 4-28). Facility operations would produce \$92.4 million in  
33 income in the 11-county ROI in 2022. Operations would produce \$1.3 million in direct State  
34 income taxes and \$3.5 million in direct property taxes (AES, 2010a). Property taxes would be  
35 payable to Bonneville County. Operations activities would constitute less than 1 percent of total  
36 two-county ROI employment in 2022 (see Section 3.12.2); the economic impact of operating the  
37 proposed EREF would be SMALL.

38  
39 Given the scale of operations activities and the likelihood of local worker availability in the  
40 required occupational categories, EREF operation would result in some in-migration of workers  
41 and their families from outside the two-county ROI, with 199 persons in-migrating into the  
42 two-county ROI during the first year of operation (AES, 2010a). Although in-migration may  
43 potentially impact local housing markets, the relatively small number of in-migrants and the  
44 availability of temporary accommodation (hotels, motels, and mobile home parks) would mean  
45 that the impact of facility operation on the number of vacant owner-occupied housing units is not  
46 expected to be large, with 87 rental units expected to be occupied in the two-county ROI during  
47 operations (AES, 2010a). These occupancy rates would represent less than 0.1 percent of the

1 vacant owner-occupied units expected to be available in the two-county ROI in 2022; the impact  
2 of EREF operations on housing would be SMALL.

3  
4 In addition to the potential impact on housing markets, in-migration would also affect local  
5 community, and educational services employment to maintain existing levels of service in the  
6 two-county ROI. Accordingly, less than one police officer and less than one firefighter would be  
7 required in the first year of operations, 2022 (AES, 2010a). Fifty-seven additional school-age  
8 children would be expected in the two-county ROI in 2022, meaning an additional  
9 three teachers would be required to maintain existing student–teacher ratios in the local school  
10 system (AES, 2010a). These staffing increases would represent less than 0.1 percent of  
11 community service employment in each employment category expected in the two-county ROI  
12 in 2022; the impact of EREF operations on community and educational services employment  
13 would be SMALL.

#### 14 15 **4.2.12.4 Potential Effect on Property Values**

16  
17 Because it is not possible to accurately predict the response in regional property markets to the  
18 construction and operation of the proposed EREF, this section discusses how a facility such as  
19 the proposed EREF might affect property values based on findings from potentially hazardous  
20 facilities elsewhere in the United States. In general, potentially hazardous facilities have the  
21 potential to affect property values in two ways (Clark et al., 1997). First, negative perceptions  
22 associated with these facilities may reduce property values if potential buyers believe that any  
23 given facility poses a potential health risk. Negative perceptions may be based on individual  
24 sensitivities regarding risks associated with proximity to these facilities, and also on sensitivities  
25 at the community level that the presence of such a facility may adversely affect the prospects for  
26 local economic development. Even though potential buyers may not personally fear a  
27 potentially hazardous facility, they may offer less for a property in the vicinity of a facility if there  
28 is fear that the facility will reduce the rate of appreciation of housing in the area. Second, there  
29 may be a positive influence on property values associated with workplace accessibility for  
30 workers at the facility, with workers offering more for property close to the facility to minimize  
31 commuting times. Workers directly associated with the facility are likely to have considerably  
32 less fear of the technology and operations at the facility than the population as a whole. The  
33 importance of this influence on property values will vary with the size of the workforce involved.

34  
35 While there is no evidence that uranium enrichment facilities impact local property values, a  
36 number of studies have assessed the impact of other potentially hazardous facilities on local  
37 property markets, including facilities such as nuclear power plants and spent nuclear fuel  
38 facilities (Clark and Nieves, 1994; Clark et al., 1997) and hazardous material and municipal  
39 waste incinerators and landfills (Kohlhase, 1991; Kiel and McClain, 1995). Many of these  
40 studies use a hedonic modeling approach<sup>14</sup> to take into account the wide range of spatial  
41 influences on property values near noxious facilities, including crime (Thaler, 1978), fiscal  
42 factors (Stull and Stull, 1991), and noise and air quality (Nelson, 1979). The general conclusion  
43 from these studies is that while there may be a small negative effect on property in the

---

<sup>14</sup> Hedonic modeling of property markets is a form of multivariate regression analysis that incorporates numerous potential influences on housing values, including housing quality and location, distance to regional employment and retail centers, the quality of regional transportation networks, and the quality and fiscal characteristics of regional educational and public service providers.

1 immediate vicinity of noxious facilities (i.e., less than 1 mile), this effect is often temporary, often  
2 coming with announcements related to specific project phases, such as site selection, the start  
3 of construction, the start of operations, etc. At larger distances and over the longer duration of  
4 the each project, no significant enduring negative property value effects have been found in  
5 these studies. Given these findings, it is unlikely that the proposed EREF would have a  
6 significant impact on local property values in the long term.

#### 7 8 **4.2.13 Environmental Justice Impacts** 9

10 As described in Sections 4.2.1 through 4.2.12 above and in Section 4.2.15 below, the impacts of  
11 the proposed EREF would mostly be SMALL for the resource areas evaluated. For these  
12 resources areas, the impacts on all human populations would be SMALL. The NRC staff has  
13 concluded that potential impacts would be SMALL to MODERATE or MODERATE in a few  
14 cases, which could potentially affect environmental justice populations; and there would be  
15 LARGE, though intermittent, short-term impacts from fugitive dust during preconstruction.  
16 However, as there are no low-income or minority populations within the 4-mile area around the  
17 proposed facility, these impacts would not be disproportionately high and adverse for these  
18 population groups.

19  
20 A brief description of impacts potentially affecting the general population in each resource area  
21 follows:  
22

- 23 • *Land Use.* As described in Section 4.2.1, the proposed EREF would be located entirely on  
24 private land. The operation of a uranium enrichment facility is consistent with the county's  
25 zoning. Current agricultural uses of the proposed EREF property would be curtailed, but  
26 similar activities would continue over large land areas surrounding the proposed EREF  
27 property and vicinity. For example, it is not anticipated that EREF preconstruction,  
28 construction, and operation would have any effect on the current land uses found on the  
29 surrounding Federal lands administered by the U.S. Bureau of Land Management. Land  
30 use impacts resulting from preconstruction, construction, and operation would be SMALL.  
31
- 32 • *Historic and Cultural Resources.* As described in Section 4.2.2, there are 13 cultural  
33 resource sites in the immediate vicinity of the proposed EREF. Only one of these sites is  
34 eligible for listing on the *National Register of Historic Places*, the John Leopard Homestead  
35 (site MW004). This site is within the construction footprint of the proposed EREF.  
36 Preconstruction activities would destroy site MW004, and the resulting impacts would be  
37 LARGE, but were considered MODERATE because the appropriate mitigation involving  
38 professional excavation of, and data recovery at, site MW004 was implemented by AES and  
39 other homestead sites of this type exist in the region (WCRM, 2010; Idaho SHPO, 2010b;  
40 Gilbert, 2010). Other than for site MW004, the impacts of the proposed project on historic  
41 and cultural resources would be SMALL.  
42
- 43 • *Visual and Scenic Resources.* As described in Section 4.2.3, preconstruction and  
44 construction equipment and the industrial character of the proposed EREF buildings would  
45 create significant contrast with the surrounding visual environment of the primarily  
46 agricultural and undeveloped rangeland. The proposed facility would be approximately  
47 2.4 kilometers (1.5 miles) from public viewing areas such as US 20 and the Hell's Half Acre  
48 Wildlife Study Area (WSA), thus the impact on views would be SMALL to MODERATE.

- 1
- 2 • *Air Quality.* As described in Section 4.2.4, preconstruction and construction traffic and
- 3 operation of construction equipment are projected to cause a temporary increase in the
- 4 concentrations of particulate matter. These impacts would be SMALL. However, fugitive
- 5 dust from land clearing and grading operations could result in large releases of particulate
- 6 matter for temporary periods of time. Such impacts would be MODERATE to LARGE during
- 7 certain preconstruction periods and activities. Facility operations could produce small
- 8 gaseous releases associated with operation of the process that could contain uranium
- 9 compounds and hydrogen fluoride. Small amounts of nonradioactive air emissions
- 10 consisting of carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM), volatile
- 11 organic compounds (VOCs), and sulfur dioxide (SO<sub>2</sub>). Air quality impacts during operations
- 12 would be SMALL.
- 13
- 14 • *Geology and Soil.* As described in Section 4.2.5, impacts would result primarily during
- 15 preconstruction and construction from surface grading and excavation activities that loosen
- 16 soil and increase the potential for erosion by wind and water. Soil compaction as a result of
- 17 heavy vehicle traffic would also increase the potential for soil erosion by increasing surface
- 18 runoff. Spills and inadvertent releases during all project phases could contaminate site
- 19 soils. Implementation of mitigation measures identified by AES would ensure that these
- 20 impacts would be SMALL.
- 21
- 22 • *Water Resources.* As described in Section 4.2.6, the water supply for the proposed facility
- 23 would be from onsite wells, and water usage would be within the water appropriation for the
- 24 proposed EREF property. The plant would also have no discharges to surface water or
- 25 groundwater. The impact of the proposed EREF on water resources would be SMALL.
- 26
- 27 • *Ecological Impacts.* As described in Section 4.2.7, impacts would occur primarily as a result
- 28 of preconstruction and construction activities, which would mean the removal of shrub
- 29 vegetation and the relocation and displacement of wildlife presently on the proposed site as
- 30 a result of noise, lighting, traffic, and human presence. Collisions with vehicles, construction
- 31 equipment, and fences may cause some wildlife mortality. No rare or unique communities
- 32 or habitats or Federally-listed threatened or endangered species have been found or are
- 33 known to occur on the proposed site. The impact of the proposed EREF on ecological
- 34 resources would be SMALL to MODERATE.
- 35
- 36 • *Noise.* As described in Section 4.2.8, increased noise associated with the operation of
- 37 construction machinery is expected during preconstruction and construction, with noise
- 38 levels of between 80 to 95 dBA at the highway entrances, access roads, and the Visitor
- 39 Center. Construction noise would be temporary and would be reduced to about 51 to
- 40 66 dBA at the nearest hiking trail point on the Hell's Half Acre WSA. Impacts would be
- 41 SMALL. Impacts during the operation of the proposed facility itself would also be SMALL.
- 42
- 43 • *Transportation.* As described in Section 4.2.9, the primary impact of preconstruction,
- 44 construction and operation on transportation resources is expected to be increased traffic on
- 45 nearby roads and highways due to truck shipments and site worker commuting.
- 46 Transportation impacts during preconstruction and construction, and during facility operation
- 47 would be SMALL to MODERATE on adjacent local roads (due to the potentially significant
- 48 increase in average daily traffic), but regional impacts would be SMALL.



- 1
- 2 • *Public and Occupational Health.* As described in Section 4.2.10, the analysis of
- 3 nonradiological impacts during preconstruction and construction includes estimated
- 4 numbers of injuries and illnesses incurred by workers and an evaluation of impacts due to
- 5 exposure to chemicals and other nonradiological substances, such as particulate matter
- 6 (dust) and vehicle exhaust. All such potential nonradiological impacts would be SMALL. No
- 7 radiological impacts are expected during preconstruction and initial facility construction, prior
- 8 to radiological materials being brought onsite. Operation of the proposed EREF could
- 9 release of small quantities of UF<sub>6</sub> during normal operations. Total uranium released to the
- 10 environment via airborne effluent discharges is anticipated to be less than 10 grams
- 11 (6.84 μCi or 0.253 MBq) per year. No liquid effluent wastes are expected from facility
- 12 operation. For a hypothetical member of the public at the proposed property boundary, the
- 13 annual dose was estimated to be approximately 0.014 millisievert per year (1.4 millirem per
- 14 year). Doses attributable to normal operation of the proposed EREF would be small
- 15 compared to the normal background dose range of 2.0 to 3.0 millisievert (200 to
- 16 300 millirem). Radiological impacts during operations would be SMALL.
- 17
- 18 • *Waste Management.* As described in Section 4.2.11, small amounts of hazardous waste
- 19 and approximately 6116 cubic meters (8000 cubic yards) of nonhazardous and
- 20 nonradioactive wastes would be generated during preconstruction and construction
- 21 activities. During operations, approximately 75,369 kilograms (165,812 pounds) of solid
- 22 nonradioactive waste would be generated annually, including approximately 5062 kilograms
- 23 (11,136 pounds) of hazardous wastes. Approximately 146,500 kilograms (322,300 pounds)
- 24 of radiological and mixed waste would be generated annually, of which approximately
- 25 100 kilograms (220 pounds) would be mixed waste. All wastes would be transferred offsite
- 26 to licensed waste facilities with adequate disposal capacity for the wastes from the proposed
- 27 EREF. Overall, impacts would be SMALL.
- 28
- 29 • *Socioeconomics.* As described in Section 4.2.12, there would be increases in regional
- 30 employment and income and tax revenue during preconstruction, construction, and
- 31 operation. Although these impacts would be SMALL compared to the 11-county economic
- 32 baseline, they are generally considered to be positive. Impacts on housing and local
- 33 community services, which could be negative if significant in-migration were to occur, would
- 34 also be SMALL.
- 35
- 36 • *Accidents.* As described in Section 4.2.15, six accident scenarios were evaluated in this EIS
- 37 as a representative selection of the types of accidents that are possible at the proposed
- 38 EREF. The representative accident scenarios selected vary in severity from high- to
- 39 intermediate-consequence events and include accidents initiated by natural phenomena
- 40 (earthquake), operator error, and equipment failure. The consequence of a criticality
- 41 accident would be high (fatality) for a worker in close proximity. Worker health
- 42 consequences are low to high from the other five accidents that involve the release of UF<sub>6</sub>.
- 43 Radiological consequences to a maximally exposed individual (MEI) at the Controlled Area
- 44 Boundary (proposed EREF property boundary) are low for all six accidents including the
- 45 criticality accident. Uranium chemical exposure to the MEI is high for one accident and low
- 46 for the remainder. For HF exposure to an MEI at the proposed property boundary, the
- 47 consequence of three accidents is intermediate, with a low consequence estimated for the
- 48 remainder. All accident scenarios predict consequences to the collective offsite public of

1 less than one lifetime cancer fatality. Impacts from accidents would be SMALL to  
2 MODERATE.

#### 3 4 **4.2.14 Separation of Preconstruction and Construction Impacts**

5  
6 As described in Section 1.4.1, the NRC has granted an exemption for AES to conduct certain  
7 preconstruction activities, and previous sections have provided estimates (where applicable) of  
8 the fractions of such impacts that are attributable to preconstruction and construction.  
9 Table 4-29 summarizes those estimates and compares the environmental impacts of  
10 preconstruction (which is not part of the proposed action) and construction (which is part of the  
11 proposed action).

#### 12 13 **4.2.15 Accident Impacts**

14  
15 The operation of the proposed EREF would involve risks to workers, the public, and the  
16 environment from potential accidents. The regulations in 10 CFR Part 70, Subpart H,  
17 “Additional Requirements for Certain Licensees Authorized to Possess a Critical Mass of  
18 Special Nuclear Material,” require that each applicant or licensee evaluate, in an ISA, its  
19 compliance with certain performance requirements. The NRC staff has conducted a  
20 confirmatory analysis (NRC, 2010f) to independently evaluate the consequences of potential  
21 accidents identified in AES’s ISA (AES, 2010c). The accidents evaluated are a representative  
22 selection of the types of accidents that are possible at the proposed EREF.

23  
24 The analytical methods used in this consequence assessment are based on NRC guidance for  
25 analysis of nuclear fuel-cycle facility accidents (NRC, 1990, 1991, 1998, 2003b). The NRC staff  
26 analyzed accidents that involve the release of UF<sub>6</sub> liquid and/or gas from process systems,  
27 components, and containers. Such accidents, if unmitigated, pose a chemical and radiological  
28 risk to workers, the public, and the environment. A generic nuclear criticality accident was also  
29 analyzed.

#### 30 31 **4.2.15.1 Accidents Considered**

32  
33 AES’s ISA (AES, 2010c) and its Emergency Plan (AES, 2010d) describe potential accidents that  
34 could occur at the proposed EREF. Accident descriptions are provided for two groups of events  
35 according to the severity of the accident consequences: high-consequence events and  
36 intermediate-consequence events.

37  
38 The NRC selected a range of possible accidents for detailed evaluation to assess the potential  
39 human health impacts associated with accidents. The representative accident scenarios  
40 selected vary in severity from high- to intermediate-consequence events and include accidents  
41 initiated by natural phenomena (earthquake), operator error, and equipment failure. The ISA  
42 considered all credible accidents at the proposed EREF. Evaluation of most accident  
43 sequences resulted in identification of design bases and design features that prevent criticality  
44 events or chemical releases to the environment. The accident scenarios evaluated were as  
45 follows:

- 46  
47 • Generic Inadvertent Nuclear Criticality

**Table 4-29 Summary and Comparison of Environmental Impacts from Preconstruction and Construction**

Resource Area	Preconstruction	Construction
Land Use	SMALL. Restrictions on land use would begin when preconstruction begins, when all grazing and agriculture would cease on the proposed EREF property. This constitutes 90 percent of the impacts to land use. The loss of the grazing and agricultural land is not considered a major impact due to the large amount of land locally available for agriculture and grazing.	SMALL. Most impacts to land use (i.e., restricting land use) would have already occurred during preconstruction. Access restrictions would only increase during construction. Land use impacts from construction are expected to be a continuation of those from preconstruction. Only 10 percent of the land use impacts are expected during construction.
Historic and Cultural Resources	MODERATE. The greatest potential for impacts on historic and cultural resources would occur during initial ground-disturbing activities, and constitutes 90 percent of the impacts on these resources. Site MW004, located within the footprint of the proposed EREF, was found to be eligible for listing on the NRHP. It would not be possible to avoid this site during preconstruction. With proper mitigation, the impact on historical and cultural resources would be MODERATE.	SMALL. The majority of impacts to historic and cultural resources in the proposed EREF site would have occurred during preconstruction, when most of the ground disturbances would occur. It is estimated that 10 percent of the impacts would occur during construction.
Visual and Scenic Resources	SMALL. Visual impacts could result from increased traffic entering the proposed site. Fugitive dust could also create visual impacts along US 20. Because preconstruction activities would not significantly alter the overall appearance of the area, impacts would be SMALL. Only 20 percent of the impacts on visual and scenic resources are expected during preconstruction because most activities will occur at ground level.	SMALL to MODERATE. Visual impacts would result from increased traffic entering the proposed site. Fugitive dust would also create visual impacts along US 20. Eighty percent of the impacts on visual and scenic resources would occur during construction because the tallest and most visible components of the proposed project (i.e., industrial buildings) would be constructed at this time.

**Table 4-29 Summary and Comparison of Environmental Impacts from Preconstruction and Construction (Cont.)**

Resource Area	Preconstruction	Construction
Air Quality	SMALL to LARGE. Impacts on ambient air quality from preconstruction would be SMALL for all HAPs and all criteria pollutants except particulates, but would be MODERATE to LARGE for particulates during certain periods of preconstruction, despite application of appropriate mitigations. Collectively, preconstruction activities are expected to constitute as much as 90 percent of the overall air quality impacts from preconstruction and construction.	SMALL. Impacts on ambient air quality from construction would be SMALL for all HAPs and all criteria pollutants. Because construction activities are expected to occur on a relatively small disturbed land area and utilize a much reduced construction workforce, and with the major pollutant-emitting activities being completed during preconstruction, construction activities are expected to constitute 10 percent of the overall impacts from preconstruction and construction.
Geology and Soils	SMALL. The terrain change on the proposed site, from gently sloping to flat, would result in SMALL impacts on soils. Short-term impacts such as an increase in soil erosion and compaction of soils would be SMALL. The majority of soil-disturbing activities (e.g., blasting and mass rock excavation) would occur during the preconstruction period; therefore, it is estimated that about 95 percent of the impacts on geology and soils would be attributed to the preconstruction phase of development.	SMALL. Because the majority of soil-disturbing activities would have occurred during the preconstruction period, it is estimated that about 5 percent of the impacts on geology and soils would be attributed to the construction phase of development.
Water Resources	SMALL. The preconstruction period is estimated to occur during an 8-month period within the first year of the overall construction period; therefore, it is estimated that about 10 percent of the impacts on water resources would be attributed to the preconstruction phase of development.	SMALL. During the 7 years of heavy construction, the annual maximum usage rate would be within the annual water right appropriation that has been transferred to the proposed EREF property for use as industrial water. As a result, impacts on the groundwater supply would be SMALL. About 90 percent of the impacts on water resources would be attributed to the construction phase of development.

**Table 4-29 Summary and Comparison of Environmental Impacts from Preconstruction and Construction (Cont.)**

Resource Area	Preconstruction	Construction
Ecological Resources	<p>MODERATE. Preconstruction would result in direct impacts due to habitat loss and wildlife mortality as well as indirect impacts primarily from fugitive dust and wildlife disturbance. Preconstruction activities on the proposed site would result in most (95 percent) of the habitat losses associated with development of the proposed EREF. The development of the proposed facility is expected to extend over an 84-month time period, with the preconstruction phase estimated to comprise 10 percent of that period. Because the greatest ecological impacts during facility development would be attributable to habitat loss and mortality associated with preconstruction activities, the estimated contribution from preconstruction would be 80 percent.</p>	<p>SMALL. Impacts associated with construction of facility components would primarily include wildlife disturbance and fugitive dust. Approximately 5 percent of habitat loss would be attributable to the construction of facility components. Facility component construction would comprise 90 percent of the 84-month construction period. Some impacts, such as wildlife disturbance due to noise and human presence, would occur throughout the long facility construction phase. The estimated contribution from facility construction to overall ecological impacts during the construction period would be 20 percent.</p>
Noise	<p>SMALL. Construction noise from the proposed EREF would be highest during construction of the highway entrances, access roads, and visitor center, and would range from 80 to 95 dBA. Construction noise would be temporary and would be reduced to about 51 to 66 dBA at the nearest hiking trail point on the Hell's Half Acre Wilderness Study Area. Noise resulting from highway interchange, proposed site access road, and visitor center construction may occur at offsite locations at levels above values suggested in Federal standards as acceptable, albeit for relatively short periods. Notwithstanding short-term noise impulse events such as blasting, adequate mitigation controls would ensure noise impacts during preconstruction would all be below recommended standards at the closest human receptor. Most of the major noise-producing activities would occur during preconstruction.</p>	<p>SMALL. Construction noise emanating from activities within the industrial footprint is expected to be attenuated to acceptable levels at the proposed facility boundaries. Adequate mitigation controls would ensure noise impacts during facility construction would all be below recommended standards at the closest human receptor.</p>



**Table 4-29 Summary and Comparison of Environmental Impacts from Preconstruction and Construction (Cont.)**

Resource Area	Preconstruction	Construction
Transportation	SMALL to MODERATE. The primary impact on transportation resources is expected to be increased traffic on nearby roads. Impacts from access road construction would be SMALL but temporary (i.e., occurring only during the period of access road construction). Approximately 10 percent of estimated transportation impacts would be attributable to preconstruction activities.	SMALL to MODERATE. Construction activities at the proposed EREF would result in a 55 percent increase in traffic volume over current levels (including the period when construction and operations overlap). Approximately 90 percent of estimated transportation impacts would be attributable to construction activities.
Public and Occupational Health	SMALL. No radiological impacts are expected during the preconstruction period. Approximately 10 percent of the total occupational injury and nonradiological impacts would occur from preconstruction activities. This value is based on AES's estimate that preconstruction activities would be completed within the first 8 months of a total 84-month construction schedule. This 10 percent estimate is likely an upper bound, as fewer workers would be expected to be involved during preconstruction than during the main construction phase.	SMALL. No radiological impacts are expected during the initial phase of facility construction. Some radiological impacts to construction workers would occur during the time period when construction and operations overlap. Approximately 90 percent of the total occupational injury and nonradiological impacts would occur from facility construction activities.
Waste Management	SMALL. Solid nonhazardous wastes generated during preconstruction would be very similar to wastes from other construction sites of industrial facilities. These wastes would be transported offsite to an approved local landfill with sufficient capacity. Approximately 10 percent of estimated waste impacts would be attributable to preconstruction activities.	SMALL. Solid nonhazardous wastes generated during construction would be very similar to wastes from other construction sites of industrial facilities and would be transported offsite to an approved local landfill. The hazardous wastes generated in association with the construction of the proposed facility due to the maintenance of construction equipment and vehicles, painting, and cleaning would be packaged and shipped offsite to licensed facilities in accordance with Federal and State environmental and occupational regulations. Approximately 90 percent of estimated waste impacts would be attributable to construction activities.

**Table 4-29 Summary and Comparison of Environmental Impacts from Preconstruction and Construction (Cont.)**

Resource Area	Preconstruction	Construction
Socioeconomics	<p>SMALL. Wage and salary spending and expenditures associated with materials, equipment, and supplies would produce income and employment and local and State tax revenue, while the migration of workers and their families into a community would affect housing availability, area community services such as healthcare, schools, and law enforcement, and the availability and cost of public utilities such as electricity, water, sanitary services, and roads. Preconstruction activities would produce total (direct and indirect) employment of 308 jobs and \$11.9 million in income. Preconstruction activities would constitute less than 1 percent of total two-county ROI employment. Proposed EREF preconstruction activities (2010–2011) would contribute 5 percent of the impacts during preconstruction and construction.</p>	<p>SMALL. Wage and salary spending and expenditures associated with materials, equipment, and supplies would produce income and employment and local and State tax revenue, while the migration of workers and their families into a community would affect housing availability, area community services, and the availability and cost of public utilities. Construction would create 1687 jobs and \$65.0 million in income the peak year. Peak year construction activities would constitute less than 1 percent of total two-county ROI employment. Proposed EREF construction activities would contribute 95 percent (2012–2022) of the impacts during preconstruction and construction.</p>
Environmental Justice	<p>SMALL. The environmental impacts associated with preconstruction of the proposed EREF would be mostly SMALL, and generally would be mitigated. For these resources areas, the impacts on all human populations would be SMALL. Potential impacts would be SMALL to MODERATE or MODERATE in a few cases, which could potentially affect environmental justice populations; and there would be LARGE, though intermittent, short-term impacts from fugitive dust during preconstruction. However, as there are no low-income or minority populations within the 4-mile area around the proposed facility, these impacts would not be disproportionately high and adverse for these population groups.</p>	<p>SMALL. For the same reasons discussed in the Preconstruction column, construction of the proposed EREF is not expected to result in disproportionately high or adverse impacts on minority or low-income populations.</p>

1  
2

- 1 • Heater Controller Failure (Hydraulic Rupture of Vessel) in the Centrifuge Test Facility
- 2
- 3 • Natural Phenomena Hazard – Earthquake
- 4
- 5 • Sampling Manifold Release of UF<sub>6</sub> to Room
- 6
- 7 • Large Facility Fire Propagating between Areas
- 8
- 9 • Sampling Cylinder Release

10  
11 Due to its nature, inadvertent nuclear criticality is the only one of the accidents that does not  
12 involve a significant release of UF<sub>6</sub>. The accident analysis does not include an estimate of the  
13 probability of occurrence of accidents, which, in combination with consequences, would reflect  
14 the overall importance of accident types; rather, analyzed accidents are assumed to occur.

#### 15 16 **4.2.15.2 Accident Consequences**

17  
18 Accidents involving release of UF<sub>6</sub> liquids or vapors were analyzed, in general, by identifying the  
19 quantity of a containerized material at risk inside the proposed facility, the amount of material  
20 released into a room as vapor or particulates under the accident scenario, the fraction of  
21 released material that is of respirable size, and the fraction of material exhausted to the  
22 atmosphere through an available pathway, typically a building ventilation system. The  
23 dispersion of released material in the atmosphere and transport to onsite locations were  
24 calculated using guidance provided in Regulatory Guide 1.111 (NRC, 1977). Dispersion and  
25 transport to offsite locations were then analyzed using the GENII computer model (PNNL, 2007)  
26 with conservative inputs for exposure parameters and atmospheric transport factors. These  
27 methods estimated direct exposures to members of the public from an airborne plume, as well  
28 as exposures over a year's time from deposited uranium materials, to determine accident  
29 consequences to the public. Impacts on the public from a criticality accident were analyzed  
30 similarly, but for radioactive gases that would be released from a criticality event in a vessel  
31 inside the proposed facility, including fission products and radioiodine.

32  
33 The performance requirements in 10 CFR Part 70, Subpart H, define acceptable levels of risk of  
34 accidents at nuclear fuel-cycle facilities, such as the proposed facility. The regulations in  
35 Subpart H require that the applicant reduce the risks of credible high-consequence and  
36 intermediate-consequence events, and assure that under normal and credible abnormal  
37 conditions, all nuclear processes are subcritical. Threshold consequence values that define the  
38 high- and intermediate-consequence events, except for criticality events, are described in  
39 Table 4-30 as taken from AES's Safety Analysis Report (SAR) (AES, 2010b).

40  
41 Receptors located at the Restricted Area Boundary (RAB) within the proposed site and at the  
42 Controlled Area Boundary (CAB) (property boundary) represent worst-case exposures to  
43 nonradiological workers at the proposed facility and members of the public, respectively.

**Table 4-30 Definition of High- and Intermediate-Consequence Events**

Receptor	Intermediate Consequence <sup>a</sup>	High Consequence
Worker – radiological	>25 rem (0.25 Sv)	>100 rem (1 Sv)
Worker – chemical (10-minute exposure)	>AEGL-2 for UF <sub>6</sub> >AEGL-2 for HF (>19 mg U/m <sup>3</sup> ) <sup>b</sup> (>78 mg HF/m <sup>3</sup> ) = (95 ppm)	>AEGL-3 for UF <sub>6</sub> >AEGL-3 for HF (>147 mg U/m <sup>3</sup> ) (>139 mg HF/m <sup>3</sup> ) = (170 ppm)
Environment at the restricted area boundary	>24-hour average release greater than 5000 times the values in Table 2 of Appendix B of 10 CFR Part 20 (=1.5 × 10 <sup>-8</sup> μCi/mL)	NA <sup>b</sup>
Individual at the controlled area boundary – radiological	>5 rem (0.05 Sv)	>25 rem (0.25 Sv)
Individual at the controlled area boundary – chemical (30-minute exposure)	>4.06 mg soluble U intake >AEGL-1 for HF (>2.4 mg U/m <sup>3</sup> ) (>0.8 mg HF/m <sup>3</sup> ) = (0.98 ppm)	>21 mg soluble U intake >AEGL-2 for HF (>13 mg U/m <sup>3</sup> ) (>28 mg HF/m <sup>3</sup> ) = (34.23 ppm)

<sup>a</sup> AEGL: Acute Exposure Guideline Levels are public and private sector derived consensus values intended to describe the risk to humans resulting from once-in-a-lifetime, or rare, exposure to airborne chemicals (EPA at <http://www.epa.gov/oppt/aegl/>).

<sup>b</sup> U = uranium; NA = not applicable.

1  
2 Table 4-31 presents the consequences from the hypothetical accidents. Consequences were  
3 evaluated against the above criteria. For the criticality accident, a worker within a few feet of the  
4 event would likely be killed. A maximally exposed individual at the CAB would receive a  
5 radiation dose of 5.7 millisieverts (0.57 rem) total effective dose equivalent, which represents a  
6 low consequence to an individual (<0.05 sievert [ $<5$  rem]). The collective dose to the offsite  
7 population to the east-southeast, as determined using GENII (PNNL, 2007), is estimated to be  
8 4.51 person-sieverts (451 person-rem). This population dose would cause an estimated  
9 0.3 lifetime cancer fatalities, or less than one fatality. Thus, the risk of health effects to the  
10 offsite public from this accident would be MODERATE.

11  
12 The consequences of the five accident scenarios involving a release of UF<sub>6</sub> vary widely, as  
13 shown in Table 4-31. Worker consequences are intermediate (between 0.05 and 0.25 sievert  
14 [5 and 25 rem]) for the scenario involving a hydraulic rupture of a Centrifuge Test Facility (CTF)  
15 feed vessel and high for the scenario involving a sampling cylinder release (>0.25 Sv [25 rem]).

16  
17 Consequences to the maximally exposed member of the public located at the CAB would be low  
18 for the hydraulic rupture of a feed vessel scenario and for the sampling manifold release  
19 scenario (<2.5 milligrams per cubic meter uranium and <0.8 milligrams per cubic meter HF).  
20 Consequences to this receptor are intermediate for the earthquake and facility-wide fire  
21 scenarios on the basis of HF exposure (between 0.8 and 28 milligrams per cubic meter), but low  
22 for uranium exposure (<2.4 milligrams per cubic meter). Consequences to this receptor are  
23 high for the sampling cylinder release on the basis of uranium exposure (>13 milligrams per  
24 cubic meter) and intermediate for HF exposure (between 0.8 and 28 milligrams per cubic  
25 meter).

**Table 4-31 Summary of Health Effects Resulting from Accidents<sup>a</sup>**

Accident	Worker <sup>b</sup>		Environment at RAB	Individual at CAB,		Collective Dose		
	U, mg/m <sup>3</sup> (rem)	HF, mg/m <sup>3</sup>	μCi/mL	U, mg/m <sup>3</sup> (rem)	HF, mg/m <sup>3</sup>	Direction	Person-rem	LCFs
Inadvertent nuclear criticality	(High <sup>c</sup> )	Not applicable	18.4 <sup>d</sup> (ratio >1)	(0.57) <sup>e</sup>	NA	ESE	451	0.3
Hydraulic rupture of a CTF feed vessel <sup>f</sup>	2.03 × 10 <sup>4</sup> (14.2)	6.83 × 10 <sup>3</sup>	4.23 × 10 <sup>-9</sup>	1.43 (0.006)	0.54	ESE	0.632	4 × 10 <sup>-4</sup>
Earthquake	9.59 (0.136)	32.2	1.28 × 10 <sup>-9</sup>	0.274 (0.001)	2.08	ESE	0.47	3 × 10 <sup>-4</sup>
Facility-wide fire	13 (0.805)	4.36	2.57 × 10 <sup>-9</sup>	0.549 (0.002)	2.08	ESE	0.94	6 × 10 <sup>-4</sup>
Sampling manifold release	89 (0.062)	29.9	2.85 × 10 <sup>-10</sup>	4.07 × 10 <sup>-2</sup> (<0.001)	1.54 × 10 <sup>-2</sup>	ESE	4.27 × 10 <sup>-2</sup>	3 × 10 <sup>-5</sup>
Sampling cylinder release	1.74 × 10 <sup>5</sup> (122)	5.85 × 10 <sup>4</sup>	4.82 × 10 <sup>-7</sup>	69.8 (0.293)	26.4	ESE	72	4 × 10 <sup>-2</sup>

<sup>a</sup> A safety evaluation (NRC, 2010f) has been conducted as part of the facility licensing process to identify Items Relied On For Safety (IROFS) for which changes in facility design may be required. Health effect impact estimates are based on calculations assuming the current design prior to any IROFS determinations. These results will be used to identify which, if any, IROFS are to be incorporated into facility designs or procedures to reduce the risks to workers, the public, and the environment to acceptably low levels.

<sup>b</sup> Worker exits after 5 minutes in all cases but the earthquake in which the exit is assumed to occur in 2.5 minutes. U = uranium.

<sup>c</sup> High consequence could lead to a fatality.

<sup>d</sup> Pursuant to 10 CFR 70.61(c)(3), this value is the sum of the fractions of individual fission product radionuclide concentrations over 5000 times the concentration limits that appear in 10 CFR Part 20, Appendix B, Table 2.

<sup>e</sup> The dose to the individual at the CAB is the sum of internal and external doses from fission products released from the criticality.

<sup>f</sup> Though the consequences of the rupture of a liquid-filled UF<sub>6</sub> vessel would be high, redundant heater-controller trips would make this event highly unlikely to occur.

1  
2 Total consequences to the public in terms of radiation dose to the population in the east-  
3 southeast direction (toward Idaho Falls) and resultant total lifetime cancer fatalities are given  
4 under Collective Dose in Table 4-31. All the accident scenarios predict less than one lifetime  
5 cancer fatality in this population.

6  
7 Of the accident scenarios analyzed by the NRC staff, the most significant accident  
8 consequences are those associated with the release of UF<sub>6</sub> caused by rupturing an overfilled or  
9 overheated cylinder and a nuclear criticality. Facility design reduces the risk (likelihood) of the  
10 rupture event by using redundant heater controller trips. In addition, the proposed facility  
11 Emergency Plan (AES, 2010d) addresses this type of event and all other lower-risk, high- and  
12 intermediate-consequence events. The NRC staff concludes that through the combination of  
13 plant design, passive and active engineered controls (Items Relied on for Safety [IROFS]),  
14



1 administrative controls, and management of these controls, accidents at the proposed facility  
2 pose an acceptably low risk to workers, the environment, and the public.

### 4.2.15.3 Mitigation Measures

6 NRC regulations and AES's operating procedures for the proposed EREF are designed to  
7 ensure that the high and intermediate accident scenarios would be highly unlikely (10 CFR  
8 Part 70, Subpart H, and AES [2010f]). The NRC staff assesses the safety features and  
9 operating procedures required to reduce the risks from accidents. The combination of  
10 responses by IROFS that mitigate or prevent emergency conditions and the implementation of  
11 emergency procedures and protective actions in accordance with the proposed EREF  
12 Emergency Plan (AES, 2010d) would limit the consequences and reduce the likelihood of  
13 accidents that could otherwise extend beyond the proposed EREF site and property boundaries.  
14 The following mitigation measures have been identified by AES to reduce the risks posed by  
15 accidents at the proposed EREF (AES, 2010c).

17 Preventative and mitigative measures within the proposed facility relevant to a fire/explosion  
18 and UF<sub>6</sub> release scenario would include: (1) fire alarm and detection systems, possibly including  
19 a fire suppression system; (2) fire barriers preventing propagation of fires into and out of areas  
20 holding quantities of uranium materials; (3) reliable protection features to prevent overheating of  
21 UF<sub>6</sub> cylinders; and (4) explicit design bases to minimize the impacts of initiating events, such as  
22 those for a seismic event. Preventative measures to guard against a criticality accident include  
23 the use of safe-by-design components (AES, 2010c).

25 Mitigative measures relevant to radiological accidents would include: (1) radiation protection  
26 systems to alert workers and isolate systems when parameters exceed set limits; (2) physical  
27 separation of areas within the facility designed to prevent or reduce exposure; (3) controlled  
28 positive or negative air pressures within designated areas to control air flow; (4) carbon  
29 absorbers, HEPA filters, and automatic trips on ventilation systems to prevent releases outside  
30 of affected areas; and (5) limited building leakage paths to the outside environment through  
31 appropriate door and building design. These features are designed to contain UF<sub>6</sub> vapors within  
32 specified building areas and attenuate any release to the environment. Preventative controls for  
33 a nuclear criticality accident would include maintaining a safe geometry of all vessels,  
34 containers, and equipment that contain fissile material and ensuring that the amount of such  
35 material in these vessels does not exceed set limits. Mitigative controls would include criticality  
36 monitoring and alarm systems and emergency response training (AES, 2010a).

### 4.2.16 Decontamination and Decommissioning Impacts

40 This section summarizes the potential environmental impacts of decontamination and  
41 decommissioning of the proposed EREF site through comparison with normal operational  
42 impacts. Decontamination and decommissioning would involve the removal and disposal of all  
43 operating equipment while leaving the structures and most support equipment decontaminated  
44 to free release levels in accordance with 10 CFR Part 20.

46 Decommissioning activities are generally described in Section 2.1.4.3 of this EIS based on the  
47 information provided by AES in the SAR (AES, 2010b). However, a complete description of  
48 actions taken to decommission the proposed EREF at the expiration of its NRC license period

1 cannot be fully determined at this time. In accordance with 10 CFR 70.38, AES must prepare  
2 and submit a decommissioning plan to the NRC at least 12 months prior to the expiration of the  
3 NRC license for the proposed EREF. AES would submit a final decommissioning plan to the  
4 NRC prior to the start of decommissioning. This plan would be the subject of further NEPA  
5 review, as appropriate, at the time the decommissioning plan is submitted to the NRC.  
6 Decontamination and decommissioning activities would be conducted to comply with all  
7 applicable Federal and State regulations in effect at the time of these activities.  
8

9 The decommissioning process is expected to occur over a 9-year period. The SBMs would be  
10 decommissioned in the first 8 years, and there would be one additional year for final site  
11 surveys and activities (AES, 2010b). SBM 1 is scheduled to be the first to operate and would be  
12 the first to undergo decontamination and decommissioning. The other SBMs would follow in  
13 turn. A single SBM is assumed by AES to take 4.5 years to decommission, with 3 years for  
14 decommissioning of the centrifuges and associated equipment and 1.5 years for  
15 decontamination of the structure (AES, 2010b). SBM 4 would be the last module to operate and  
16 to be decommissioned. The remaining plant systems and buildings would be decommissioned  
17 after final shutdown of SBM 4.  
18

19 The decontamination and decommissioning would include:

- 20 • installation of decontamination facilities
- 21
- 22 • purging of process systems
- 23
- 24 • dismantling and removal of equipment
- 25
- 26 • decontamination and destruction of confidential and secret restricted data material
- 27
- 28 • sales of salvaged materials
- 29
- 30 • disposal of wastes
- 31
- 32 • completion of a final radiation survey
- 33
- 34

35 The primary environmental impacts of the decontamination and decommissioning of the  
36 proposed EREF site include changes in releases to the atmosphere and surrounding  
37 environment and disposal of industrial trash and decontaminated equipment. The types of  
38 impacts that may occur during decontamination and decommissioning would be similar to many  
39 of those that would occur during the initial construction of the proposed facility. Some impacts,  
40 such as water usage and the number of truck trips, could increase during the decontamination  
41 and disposal phase of the decommissioning but would be less than during the construction  
42 phase; thus they would be bounded by the impacts in Sections 4.2.4 through 4.2.9.  
43  
44

1 **4.2.16.1 Land Use**

2  
3 As discussed in Section 4.2.1, the proposed AES property is zoned for uses such as the  
4 proposed EREF. The potential for impacts on land use is greatest during preconstruction and  
5 construction of the proposed EREF. The decontamination and decommissioning of the  
6 proposed facility would not be expected to result in a change in land use from operation.  
7 The land use would remain restricted to industrial uses. Since decontamination and  
8 decommissioning is not expected to affect land use, the impacts would be SMALL.  
9

10 **4.2.16.2 Historic and Cultural Resources**

11  
12 Ground-disturbing activities have the greatest potential for impacting historic and cultural  
13 resources. Ground disturbance at the proposed EREF site affecting cultural resources would  
14 have occurred during preconstruction for the proposed EREF. Any area disturbed during  
15 decontamination and decommissioning would be expected to no longer have the potential for  
16 historic and cultural resources. Therefore, it is not expected that any historic and cultural  
17 resources would be affected by decontamination and decommissioning of the proposed EREF;  
18 therefore, the impact would be SMALL.  
19

20 **4.2.16.3 Visual and Scenic Resources**

21  
22 The decontamination and decommissioning of the proposed EREF would have little additional  
23 effect on visual and scenic resources. Many buildings and the perimeter lighting would remain  
24 in place as part of the decontamination and decommissioning. Thus, the overall visual and  
25 scenic landscape would not be altered drastically from operations. Therefore, the impacts on  
26 visual and scenic resources of decontamination and decommissioning would be SMALL to  
27 MODERATE.  
28

29 **4.2.16.4 Air Quality**

30  
31 Decontamination and decommissioning activities would result in air quality impacts similar to  
32 those resulting from preconstruction and construction, although to a lesser magnitude and for a  
33 substantially shorter duration. Primary sources of air impacts during decontamination and  
34 decommissioning would include the operation of various construction equipment, onsite fueling  
35 and maintenance of construction equipment, the use of explosives to remove foundations if  
36 necessary, material handling and stockpiling, commuting to the proposed site (by a workforce  
37 that is expected to be substantially smaller than the initial construction workforce), and offsite  
38 transfer of recyclable materials and equipment and wastes destined for offsite treatment and  
39 disposal facilities. The most significant sources of fugitive dust expected in preconstruction and  
40 construction, cut-and-fill operations and travel on unpaved onsite roads, would either not be  
41 operative during decontamination and decommissioning or would be undertaken at substantially  
42 reduced levels. Unique aspects of the decontamination and decommissioning plan, such as  
43 whether buried utilities and improvements are removed or abandoned in place, can be expected  
44 to have incremental impacts on associated air quality impacts.  
45

46 The absence of a specific decontamination and decommissioning plan prevents a quantitative  
47 analysis of decontamination and decommissioning impacts on air quality. The NRC staff  
48 concludes that air impacts from preconstruction and construction would be bounding

1 (see Tables 4-1 through 4-3 in Section 4.2.4.1 of this EIS) and that air impacts from  
2 decontamination and decommissioning would be less. The NRC staff therefore concludes that  
3 air impacts from decontamination and decommissioning would be SMALL.  
4

#### 5 **4.2.16.5 Geology and Soils**

6

7 Impacts to geology and soils during the decontamination and decommissioning phase would  
8 result from short-term disturbances of land (e.g., clearing and grading) for equipment laydown  
9 and disassembly. Land disturbance could temporarily increase the potential for soil erosion at  
10 the proposed EREF site, resulting in impacts similar to (but less than) those described for the  
11 preconstruction/construction phase (see Section 4.2.5.1). Mitigation measures would be  
12 implemented to minimize soil erosion and to control fugitive dust. Thus, impacts to geology and  
13 soils due to decontamination and decommissioning activities would be SMALL.  
14

#### 15 **4.2.16.6 Water Resources**

16

17 The water supply for the decontamination and decommissioning of the proposed EREF would  
18 be obtained from one or more onsite wells already completed in the ESRP aquifer. No surface  
19 water sources would be used. During this phase, water would be consumed for potable and  
20 sanitary needs, and for building and equipment rinsing (decontamination). Other water uses  
21 would include dust control, compaction of fill, and watering of vegetation. None of this water  
22 would be returned to its original source.  
23

24 Water use rates would vary during the 9-year decontamination and decommissioning period but  
25 would not exceed annual usage during normal operations, because less than half as many  
26 workers would be onsite during decontamination and decommissioning (AES, 2010a) and water  
27 usage would be within the capacity of the water right appropriation throughout this phase.  
28 Liquid effluent quantities from decontamination and decommissioning activities are expected to  
29 be higher than during normal operations (AES, 2009b). All liquid effluents, including the spent  
30 citric acid solution used for building and equipment rinsing, would be treated and discharged by  
31 evaporation to the atmosphere in the Liquid Effluent Treatment System Evaporator. Once the  
32 Liquid Effluent Collection and Treatment System is removed from service, temporary skid-  
33 mounted systems would be used to process any remaining liquid wastes. No process effluents  
34 would be discharged to the stormwater retention/detention basins or into surface water  
35 (AES, 2009b).  
36

37 Runoff from paved areas and building roofs would continue to be diverted to three stormwater  
38 detention/retention basins for evaporation during the decontamination and decommissioning  
39 phase. At the end of this phase, mud or soil in the bottom of these basins would be tested for  
40 contamination and disposed of accordingly. The basins and berms would then be leveled to  
41 restore the land to its natural contour.  
42

43 The Liquid Effluent Treatment System Evaporator would remain in operation throughout most of  
44 the decontamination and decommissioning phase. Liquids used to clean and decontaminate  
45 buildings and equipment would be treated and discharged by evaporation to the atmosphere in  
46 the system evaporator. Once the decontamination process has concluded and all effluents  
47 have evaporated, sludge and soil in the bottom of the evaporator would be tested and disposed

1 of in accordance with regulatory requirements and in such as way as to meet the standards for  
2 releasing the proposed site for unrestricted use, as defined in 10 CFR 20.1402.

3  
4 Since the usage and discharge impacts to water resources during the decontamination and  
5 decommissioning phase would be similar to those during operations, the impacts to water  
6 resources would be SMALL.

#### 7 8 **4.2.16.7 Ecological Resources**

9  
10 Plant communities and wildlife that became established near the proposed facility during the  
11 operational period could be affected by decontamination and decommissioning activities.  
12 Although the structures of the proposed EREF would be left in place, vegetation would be  
13 removed from land areas disturbed during decontamination and decommissioning activities,  
14 such as regraded basin areas. During the decontamination and decommissioning period,  
15 wildlife in the vicinity of the proposed facility would be disturbed by noise associated with  
16 decommissioning activities, and many species would be displaced to adjacent habitats. Noise  
17 levels generated by decommissioning would likely be similar to those during preconstruction  
18 and initial facility construction. Wildlife use of the proposed site would increase following the  
19 termination of decommissioning activities. Ecological impacts from decontamination and  
20 decommissioning would be SMALL.

#### 21 22 **4.2.16.8 Noise**

23  
24 Noise sources and levels would be similar to noise during site preconstruction and construction,  
25 and peaking noise levels would be expected to occur for short durations, primarily during  
26 preconstruction. Although a detailed decontamination and decommissioning plan has not yet  
27 been developed, major noise sources can be expected to include: the operation of heavy-duty  
28 construction equipment; traffic noise resulting from the commuting decontamination and  
29 decommissioning workforce and delivery vehicles used to transport disassembled components  
30 and waste materials to offsite facilities for redeployment, recycling, or disposal; the potential use  
31 of explosives or impact hammers to break up some structures if necessary, such as  
32 foundations, roads, and pavements; excavations of buried utilities and components; and cut-  
33 and-fill operations designed to return the proposed site to its original grades and contours in  
34 some areas.

35  
36 Offsite noise impacts can be expected to be similar to those for preconstruction and  
37 construction (see Section 4.2.8.1). Noise associated with excavation and removal of buried  
38 utilities would not occur for those belowground components that are abandoned in place.  
39 Based on detailed information currently available, the NRC staff concludes that noise impacts  
40 from decommissioning would be less than those expected to occur in the preconstruction and  
41 construction phases and would therefore be SMALL.

#### 42 43 **4.2.16.9 Transportation**

44  
45 Traffic during the initial portion of the decontamination and decommissioning activities would be  
46 approximately the same as during the period when construction and facility operation overlap  
47 (AES, 2010a). Traffic after the cessation of facility operation would be less than the volume  
48 experienced during either construction or operation. Site roads, if properly maintained, would



1 be adequate to accommodate the additional traffic volume, and the increased traffic would have  
2 a SMALL to MODERATE impact on the current traffic on US 20. However, the number of heavy  
3 trucks would be substantial for brief periods of time as waste materials were removed; therefore,  
4 transportation impacts for construction would be bounding.  
5

6 If the depleted UF<sub>6</sub> has not been removed prior to the cessation of operations, it would be  
7 shipped offsite during the decommissioning phase. As shown in Table 2-2 in Section 2.1.4.2 of  
8 this EIS, the operation of the proposed EREF would generate up to 25,718 Type 48Y cylinders  
9 of depleted UF<sub>6</sub> tails during its operational lifetime. Type 48Y cylinders would be shipped one  
10 cylinder per truck for disposal. Assuming that all of the material is shipped during the first  
11 8 years of decommissioning (the final radiation survey and decontamination would occur during  
12 the final year of decommissioning), approximately 4205 truckloads per year would be shipped  
13 from the proposed EREF. If the trucks are limited to weekday, nonholiday shipments,  
14 approximately 17 trucks per day would leave the proposed site for the depleted UF<sub>6</sub> conversion  
15 facility. Section 4.2.9 presents the impacts of shipping depleted UF<sub>6</sub> to the conversion facility,  
16 which would be SMALL.  
17

#### 18 **4.2.16.10 Public and Occupational Health**

##### 19 **Occupational Injuries and Illnesses**

20  
21  
22 Occupational injuries and illnesses would be expected to be incurred during decontamination  
23 and decommissioning of the proposed EREF. The staged decommissioning is expected to take  
24 9 years to complete. The nature of decontamination and decommissioning activities, which  
25 would involve dismantling some structures and equipment, would be similar to those for  
26 preconstruction and construction of the proposed facility, while the job classification used to  
27 estimate construction injuries in Section 4.2.12.1, North American Industry Classification  
28 System Code 237, "Other Heavy and Civil Engineering Construction," should also apply to  
29 dismantlement. In addition, the expected 9-year duration for decontamination and  
30 decommissioning is similar to the expected 7-year heavy construction period, and impacts from  
31 occupational injuries and illnesses during decontamination and decommissioning would be  
32 similar to those during construction. Chemical exposures would be controlled to below levels of  
33 concern through removal of hazardous chemicals from process lines and equipment. Thus,  
34 public and occupational health impacts would be SMALL.  
35

##### 36 **Radiological Impacts**

37  
38 Exposures during decontamination and decommissioning would be bounded by the potential  
39 exposures during operation because standard quantities of uranium material (i.e., UF<sub>6</sub> in  
40 Type 48Y cylinders) would be handled during the portion of the decontamination and  
41 decommissioning operations that purges the gaseous centrifuge cascades of UF<sub>6</sub>. Once this  
42 decontamination operation is completed, UF<sub>6</sub> would be present only in residual amounts and  
43 handled significantly less than during operations. Because systems containing residual UF<sub>6</sub>  
44 would be opened, decontaminated (with the removed radioactive material processed and  
45 packaged for disposal), and dismantled, an active environmental monitoring and dosimetry  
46 (external and internal) program would be conducted to maintain ALARA doses and doses to  
47 individual members of the public as required by 10 CFR Part 20. Therefore, the impacts to  
48 public and occupational health would be SMALL.  
49

1 **4.2.16.11 Waste Management**

2  
3 The waste management and recycling programs used during operations would also apply to  
4 decontamination and decommissioning. Materials eligible for recycling would be sampled or  
5 surveyed to ensure that contaminant levels would be below release limits. Enrichment  
6 equipment would be removed, depleted UF<sub>6</sub> would be transported to a conversion facility,  
7 buildings and other structures would be decontaminated, and debris would be shipped offsite for  
8 disposal. Radioactive material from decontamination and contaminated equipment would be  
9 packaged and shipped offsite to an appropriately licensed facility. Staging and laydown areas  
10 would be segregated and managed to prevent contamination of the environment and creation of  
11 additional wastes. Long-term storage and monitoring of wastes at the proposed EREF site  
12 would be avoided, as the generated wastes would not require delayed removal from the site.  
13 Disposal volumes of the various waste streams are anticipated to be similar to those for the  
14 NEF, including 7700 cubic meters (10,070 cubic yards) of low-level radioactive waste  
15 (AES, 2010a). Due to the availability of adequate disposal capacity for Class A low-level  
16 radioactive waste over the long term (GAO, 2004), the waste management impacts of  
17 decontamination and decommissioning would be SMALL.  
18

19 **4.2.16.12 Socioeconomics**

20  
21 Decontamination and decommissioning of the proposed EREF would provide continuing  
22 employment opportunities for some of the existing operations workforce and for other residents  
23 of the 11-county ROI. Additional specialized decommissioning workers would be required from  
24 outside the 11-county ROI. Although at a lower level than during operations, expenditures on  
25 salaries and materials would contribute to the area economy, and the State would continue to  
26 collect sales tax and income tax revenues. As was the case with the preconstruction,  
27 construction, and operations phases of the proposed project, the socioeconomic impact of  
28 decommissioning activities would be SMALL.  
29

30 **4.2.16.13 Environmental Justice**

31  
32 As described in Sections 4.2.16.1 through 4.2.16.12, the impacts of the proposed action during  
33 decontamination and decommissioning would be SMALL for all of the resource areas evaluated,  
34 and would not potentially affect environmental justice populations. Even where environmental  
35 impacts would be SMALL, the behaviors of some subpopulations may lead to disproportionate  
36 exposure through inhalation or ingestion (e.g., higher participation in outdoor recreation, home  
37 gardening, and subsistence fishing). However, because impacts on the general population  
38 would be SMALL, and because there are no Census block groups in which the low-income  
39 population either exceeds 50 percent of the total population and/or is more than 20 percentage  
40 points higher than the State or county percentage, decontamination and decommissioning of the  
41 proposed facility would not, therefore, produce any environmental justice concerns.  
42

43 Overall, therefore, decontamination and decommissioning of the proposed EREF is not  
44 expected to result in disproportionately high or adverse impacts on minority or low-income  
45 populations.  
46  
47

1 **4.2.16.14 Mitigation Measures**  
2

3 AES identified the measures listed below to mitigate impacts of decontamination and  
4 decommissioning activities (AES, 2010a). These measures should be considered preliminary  
5 because decontamination and decommissioning would occur more than 20 years in the future.  
6

- 7 • *Ecological resources:* Mitigation measures would be taken to protect migratory birds during  
8 decommissioning, e.g., clearing or removal of habitat, such as sagebrush, including buffer  
9 zones, would be performed outside of the migratory bird breeding and nesting season;  
10 additional areas to be cleared would be surveyed for active nests during migratory bird  
11 breeding and nesting season; activities would be avoided in areas containing active nests of  
12 migratory birds; the FWS would be consulted to determine the appropriate actions regarding  
13 the taking of migratory birds, if needed.  
14
- 15 • *Noise:* Mitigation of noise impacts from decommissioning would include sequencing noise-  
16 producing activities to minimize the overall noise and vibration impacts.  
17
- 18 • *Public and occupational health:* Mitigation measures during decontamination and  
19 decommissioning operations are similar to those for the operational period. The goal of the  
20 mitigation measures would be to reduce the spread of radioactive contamination which  
21 would then reduce the unnecessary exposure or overexposure. These mitigation measures  
22 would be implemented by adapting design concepts that would minimize/prevent the spread  
23 of contamination from room to room. In addition, the creation of unrestricted and restricted  
24 areas would possibly reduce the spread of contamination by limiting the numbers of  
25 personnel within the work area. In addition, the creation of design features such as  
26 providing curbing and other barriers around tanks and other components containing liquids  
27 in order to limit spills would possibly reduce the spread of contamination.  
28

29 **4.2.17 Greenhouse Gas Emissions Associated with the Proposed EREF**  
30

31 This section presents an assessment of the effect preconstruction, construction, operation, and  
32 decommissioning of the proposed EREF can be expected to have on carbon dioxide and other  
33 greenhouse gas emissions.  
34

35 **4.2.17.1 Greenhouse Gases**  
36

37 Greenhouse gases (GHGs) include those gases, such as carbon dioxide (CO<sub>2</sub>), water vapor,  
38 nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and  
39 sulfur hexafluoride (SF<sub>6</sub>), that are transparent to solar (short-wave) radiation but opaque to long-  
40 wave (infrared) radiation from the earth's surface. The net effect over time is a trapping of  
41 absorbed radiation and a tendency to warm the planet's surface and the boundary layer of the  
42 earth's atmosphere, which constitute the "greenhouse effect" (IPCC, 2007). Some direct GHGs  
43 <sup>15</sup> (CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O) are both naturally occurring and the product of industrial activities, while  
44 others such as the hydrofluorocarbons are man-made and are present in the atmosphere  
45 exclusively due to human activities. Each GHG has a different radiative forcing potential

---

<sup>15</sup> Direct GHGs are those gases that can directly affect global warming once they are released into the atmosphere.

1 (the ability to affect a change in climatic conditions in the troposphere, expressed as the amount  
2 of thermal energy [in watts] trapped by the gas per square meter of the earth's surface)  
3 (IPCC, 2007). The radiative efficiency of a GHG is directly related to its concentration in the  
4 atmosphere.

5  
6 As a way to compare the radiative forcing potentials of various GHGs without directly calculating  
7 changes in their atmospheric concentrations, an index known as the Global Warming Potential  
8 (GWP) (IPCC, 2007) has been established with CO<sub>2</sub>, the most abundant of GHGs released to  
9 the atmosphere (after water vapor),<sup>16</sup> established as the reference point. GWPs are calculated  
10 as the ratio of the radiative forcing that would result from the emission of 1 kilogram  
11 (2.2 pounds) of a GHG to that which would result from the emission of 1 kilogram (2.2 pounds)  
12 of CO<sub>2</sub> over a fixed period of time. GWPs represent the combined effect of the amount of time  
13 each GHG remains in the atmosphere and its ability to absorb outgoing thermal infrared  
14 radiation. As the reference point in this index, CO<sub>2</sub> has a GWP of 1. On the basis of a 100-year  
15 time horizon, GWPs for other key GHGs are as follows: 21 for CH<sub>4</sub>, 310 for N<sub>2</sub>O, 11,700 for  
16 HFC-23, and 23,900 for SF<sub>6</sub> (IPCC, 2007).

17  
18 Indirect GHGs, carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>),<sup>17</sup> nonmethane volatile organic  
19 compounds (NMVOCs), and sulfur dioxide (SO<sub>2</sub>), indirectly affect terrestrial solar radiation  
20 absorption by influencing the formation and destruction of tropospheric and stratospheric ozone  
21 or, in the case of SO<sub>2</sub>, by affecting the absorptive characteristics of the atmosphere.

#### 22 23 **4.2.17.2 Greenhouse Gas Emissions and Sinks in the United States**

24  
25 The EPA is responsible for preparation and maintenance of the official U.S. Inventory of  
26 Greenhouse Gas Emissions and Sinks<sup>18</sup> to comply with existing commitments under the United  
27 Nations Framework Convention on Climate Change (UNFCCC). GHG emissions<sup>19</sup> are reported  
28 in sectors, using the GWPs established in the Second Assessment Report of the  
29 Intergovernmental Panel on Climate Change (IPCC).<sup>20</sup> Preconstruction, construction, operation,  
30 and decommissioning of the proposed EREF would result in the release of GHGs as a result of  
31 the same human activities that were identified by EPA as the sources of GHGs in the

---

<sup>16</sup> Water vapor is the most abundant and most dominant greenhouse gas in the atmosphere. However, it is neither long-lived nor well mixed in the atmosphere, varying spatially from 0 to 2 percent.

<sup>17</sup> NO<sub>x</sub> represents all thermodynamically stable oxides of nitrogen, excluding nitrous oxide (N<sub>2</sub>O).

<sup>18</sup> GHG sinks are those activities or processes that can remove GHGs from the atmosphere.

<sup>19</sup> In keeping with the GWP convention that names CO<sub>2</sub> as the reference gas, assigning it a GWP of 1, GWPs of other direct GHGs are expressed as equivalents (Eq.) of CO<sub>2</sub>, expressed in teragrams (Tg) of CO<sub>2</sub> equivalent (Tg CO<sub>2</sub> Eq.). One teragram is equal to 10<sup>12</sup> grams, or one million metric tons (1.12 million tons).

<sup>20</sup> IPCC assessment reports are a compilation of separate reports of the various working groups that are established by the Panel. IPCC periodically updates assessment reports to incorporate newly established data, including revisions to GWPs and radiative forcing potentials of GHGs. The latest is the Fourth Assessment Report, published in 2007. Revised GWPs are contained in the report of Working Group I (IPCC, 2007). However, to provide for the analysis of trends of GHG emissions and sinks over time, nations responsible for GHG inventories continue to use the GHG GWPs established in the Second Assessment Report published in 1996.

1 U.S. Inventory. Results of the most recent report on the U.S. Inventory of GHG Emissions and  
2 Sinks (EPA, 2009b) for direct GHGs that are most relevant to the proposed EREF include:

- 3
- 4 • The primary GHG emitted by human activities in the United States was CO<sub>2</sub>, representing  
5 approximately 85.4 percent of the total GHG emissions.  
6
- 7 • In 2007, total U.S. GHG emissions were 7150.1 Tg CO<sub>2</sub> Eq., an increase of 17 percent from  
8 1990.  
9
- 10 • Overall emissions of GHGs rose from 2006 to 2007 by 1.4 percent (9 Tg CO<sub>2</sub> Eq.).  
11
- 12 • CO<sub>2</sub> emissions for 2007 were 6103.4 Tg CO<sub>2</sub> Eq., 5735.8 of which was the result of  
13 combustion of fossil fuel primarily related to electricity generation (2397.2), transportation  
14 (1887.4), industrial applications (845.4), residential heating (340.6), and commercial  
15 applications (214.4).  
16
- 17 • Sixty percent of the CO<sub>2</sub> emissions related to transportation were the result of consumption  
18 of gasoline in privately owned vehicles; the remainder was from combustion of fuels in  
19 diesel trucks and aircraft.  
20
- 21 • Emissions of methane in 2007 as a result of combustion of fossil fuels in mobile sources  
22 were 2.3 Tg CO<sub>2</sub> Eq.  
23
- 24 • Emissions of nitrous oxide in 2007 as a result of combustion of fossil fuels in mobile sources  
25 were 30.1 Tg CO<sub>2</sub> Eq.  
26
- 27 • Emissions of HFCs (released from equipment) in 2007 were 108.3 Tg CO<sub>2</sub> Eq.  
28
- 29 • Emissions of SF<sub>6</sub> in 2007 as a result of electrical transmission and distribution<sup>21</sup> were  
30 12.7 Tg CO<sub>2</sub> Eq.  
31
- 32 • The primary GHG sinks functional in 2007 included carbon sequestration in forests, trees in  
33 urban areas, agricultural soils, and landfilled yard trimmings and food scraps, all of which, in  
34 aggregate, offset 14.9 percent of the total GHG emissions in 2007.  
35
- 36 • The most significant emissions of indirect GHGs in 2007 included:  
37
  - 38 – 14,250 Tg CO<sub>2</sub> Eq. of NO<sub>x</sub> primarily from mobile fossil fuel combustion (7831), stationary  
39 fuel combustion (5445), and industrial processes (520).
  - 40 – 63,875 Tg CO<sub>2</sub> Eq. of CO primarily from mobile fossil fuel combustion (54,678),  
41 stationary fossil fuel combustion (4792), and industrial processes (1743).
  - 42 – 13,747 Tg CO<sub>2</sub> Eq. of NMVOCs primarily from mobile fossil fuel combustion (5672),  
43 solvent use (3855), industrial processes (1878), and stationary fossil fuel combustion  
44 (1470).

---

<sup>21</sup> SF<sub>6</sub> is a gas at standard conditions and is used as a dielectric medium in high-voltage electrical equipment.



- 11,725 Tg CO<sub>2</sub> Eq. of SO<sub>2</sub> primarily from stationary fossil fuel combustion (10,211), industrial processes (839), and mobile fossil fuel combustion (442).

As noted above, consumption of fossil fuels for electricity generation represents the single greatest source of CO<sub>2</sub> emissions in 2007 (5735.8 Tg CO<sub>2</sub> Eq.). The CO<sub>2</sub> equivalents represented in the electricity that was delivered to end users in four sectors in 2007 include: transportation (1892.2), industrial (1553.4), residential (1198.0), and commercial (1041.4). The total gross GHG emissions in the United States from all sectors in 2007 were 7150 Tg CO<sub>2</sub> Eq. Net emissions (including all emissions and sinks) were 6087.5 Tg CO<sub>2</sub> Eq.

#### **4.2.17.3 Greenhouse Gas Emissions and Sinks in Idaho**

A review of statewide emissions of GHGs can provide an understanding of the impact anticipated GHG emissions from the proposed EREF would have in a regional context. Among States, Idaho ranks 47th with respect to emissions of GHGs and 39th in population (based on 2003 data) (NextGenerationEarth, 2009). However, Idaho’s emissions of GHGs increased by 31 percent over the period 1990 to 2005 while GHG emissions on a national level increased by only 16 percent (IDEQ, 2009). The Idaho Department of Environmental Quality, in collaboration with the Center for Climate Strategies (CCS),<sup>22</sup> published a report in the spring of 2008 on Idaho’s Greenhouse Gas Inventory and Reference Case projections for the period 1990–2020 (CCS, 2008). The relevant data from that report appear in Table 4-32. Table 4-33 provides the most recent comparison of GHG inventories by sector in Idaho vs. the United States for calendar year 2000.

#### **4.2.17.4 Projected Impacts from Preconstruction, Construction, Operation, and Decommissioning of the Proposed EREF on Carbon Dioxide and Other Greenhouse Gases**

Preconstruction, construction, operation, and decommissioning of the proposed EREF can be expected to result in emissions of CO<sub>2</sub> and other GHGs through various mechanisms, primarily from combustion of fossil fuels in both mobile and stationary sources. Individual contributions of preconstruction, construction, operation, and decommissioning are discussed below. Transportation volumes used in the following sections were established in Section 4.2.10 and are applied here without modification.

#### **Estimated GHG Emissions during Preconstruction and Construction**

During preconstruction and construction, fossil fuels would be consumed onsite to support construction vehicles and equipment, as a result of commuting to and from the proposed site by the construction workforce and by delivery vehicles bringing materials and equipment to the proposed site and removing construction-related wastes from the proposed site to area landfills and treatment/disposal facilities.

---

<sup>22</sup> The Center for Climate Strategies is a public-purpose, nonprofit, nonpartisan 501(c)(3) partnership organization established in 2004 to assist in climate policy development at the Federal and State levels.

**Table 4-32 Idaho Historical and Reference Case GHG Emissions, by Sector<sup>a</sup>**

Sector	Carbon Dioxide Equivalents (million metric tons)				
	1990	2000	2005	2010	2020
<b>Energy</b>	<b>16.6</b>	<b>22.2</b>	<b>22.1</b>	<b>23.4</b>	<b>26.8</b>
Electricity production	0.0	0.1	0.6	0.6	0.9
Coal	0.00	0.00	0.00	0.00	0.00
Natural gas	0.00	0.09	0.62	0.64	0.92
Oil	0.00	0.00	0.00	0.00	0.00
Net imported electricity	3.9	4.8	4.7	4.6	5.5
<b>Electricity consumption based</b>	<b>3.9</b>	<b>4.9</b>	<b>5.3</b>	<b>5.2</b>	<b>6.4</b>
<b>Residential/commercial/industrial (RCI) fuel use</b>	<b>5.1</b>	<b>6.8</b>	<b>6.1</b>	<b>6.7</b>	<b>7.7</b>
Coal	0.96	1.29	0.96	1.01	1.00
Natural gas	2.17	3.47	3.09	3.42	4.05
Wood (CH <sub>4</sub> and N <sub>2</sub> O)	0.05	0.06	0.05	0.06	0.06
<b>Transportation</b>	<b>7.3</b>	<b>10.1</b>	<b>10.2</b>	<b>11.0</b>	<b>12.2</b>
Motor gasoline	5.25	7.13	6.98	7.25	7.67
Diesel	1.47	2.48	2.79	3.29	4.01
Natural gas, LPG, other	0.07	0.07	0.07	0.07	0.09
Jet fuel and aviation gasoline	0.46	0.36	0.35	0.37	0.38
<b>Fossil fuel industry</b>	<b>0.3</b>	<b>0.4</b>	<b>0.4</b>	<b>0.5</b>	<b>0.6</b>
Natural gas industry	0.32	0.45	0.42	0.46	0.55
Oil industry	0.00	0.00	0.00	0.00	0.00
Coal mining (methane)	0.00	0.00	0.00	0.00	0.00
<b>Industrial processes</b>	<b>0.4</b>	<b>0.8</b>	<b>1.1</b>	<b>1.3</b>	<b>1.9</b>
Cement manufacture (CO <sub>2</sub> )	0.06	0.06	0.13	0.14	0.16
Lime manufacture (CO <sub>2</sub> )	0.03	0.03	0.06	0.07	0.08
Limestone & dolomite use (CO <sub>2</sub> )	0.00	0.00	0.01	0.01	0.01
Soda Ash (CO <sub>2</sub> )	0.01	0.01	0.01	0.01	0.01
ODS substitutes (HFC, PFC, and SF <sub>6</sub> )	0.08	0.21	0.13	0.09	0.05
Semiconductor manufacturing (HFC, PFC, and SF <sub>6</sub> )	0.08	0.21	0.13	0.09	0.05
Electric power T&D (SF <sub>6</sub> )	0.19	0.11	0.09	0.07	0.04

**Table 4-32 Idaho Historical and Reference Case GHG Emissions, by Sector<sup>a</sup> (Cont.)**

Sector	Carbon Dioxide Equivalents (million metric tons)				
	1990	2000	2005	2010	2020
<b>Waste management</b>	<b>1.0</b>	<b>1.2</b>	<b>1.4</b>	<b>1.5</b>	<b>1.8</b>
Solid waste management	0.85	1.09	1.19	1.31	1.59
Wastewater management	0.13	0.16	0.17	0.18	0.21
<b>Agriculture</b>	<b>6.8</b>	<b>9.0</b>	<b>9.1</b>	<b>9.9</b>	<b>10.0</b>
Enteric fermentation	2.26	2.81	3.19	3.52	3.52
Manure management	0.70	1.50	1.97	2.33	2.33
Soils and residue burning	3.88	4.66	3.97	4.04	4.15
<b>Forestry and land use</b>	<b>3.6</b>	<b>3.6</b>	<b>3.6</b>	<b>3.6</b>	<b>3.6</b>
<b>Total gross emissions</b>	<b>28.4</b>	<b>36.8</b>	<b>37.2</b>	<b>39.6</b>	<b>44.1</b>
<i>Increase relative to 1990</i>		30%	31%	40%	56%
<b>Agriculture soils</b>	<b>-1.2</b>	<b>-1.2</b>	<b>-1.2</b>	<b>-1.2</b>	<b>-1.2</b>
<b>Net emissions (including sinks)</b>	<b>27.2</b>	<b>35.6</b>	<b>36.0</b>	<b>38.4</b>	<b>42.9</b>

<sup>a</sup> Totals may not equal exact sum of subtotals shown in this table due to independent rounding. LPG = liquefied petroleum gas; ODS = ozone-depleting substance; T&D = transmission and distribution; SF<sub>6</sub> = sulfur hexafluoride.

Source: CCS, 2008.

1  
2 AES (2010a) has estimated that over the 7-year period of preconstruction and heavy  
3 construction when the most construction activity would take place (50 weeks per year, 250 days  
4 per year), gasoline and diesel fuel would be consumed at rates of 1325 liters (350 gallons) per  
5 week and 37,854 liters (10,000 gallons) per week, respectively (assumed to be an average over  
6 each year of the 7-year preconstruction and heavy construction period). Total amounts of fuels  
7 consumed throughout the expected 350 weeks of the preconstruction and heavy construction  
8 period were then estimated to be 463,713 liters (122,500 gallons) of gasoline and  
9 13,248,941 liters (3,500,000 gallons) of diesel (AES, 2010a). Following the IPCC guidelines for  
10 calculating emission inventories,<sup>23</sup> gasoline combustion is expected to occur at 99 percent  
11 efficiency, each gallon releasing 8.8 kilograms (19.4 pounds) of CO<sub>2</sub>. Likewise, diesel fuel  
12 burned at the same combustion efficiency would release 10.0 kilograms (22.2 pounds) of CO<sub>2</sub>  
13 per gallon. The resulting CO<sub>2</sub> emissions from onsite consumption of fossil fuels are shown in  
14 Table 4-34.  
15

<sup>23</sup> IPCC guidelines for emission calculations can be found at the following EPA Web sites:  
<http://www.epa.gov/OMS/climate/420f05001.htm> and <http://www.epa.gov/otaq/climate/index.htm>.  
Consumption of one gallon of gasoline will result in the release of 8.8 kilograms (19.4 pounds) of CO<sub>2</sub>;  
one gallon of diesel fuel will yield 10.4 kilograms (22.2 pounds) of CO<sub>2</sub> (EPA, 2005b).

**Table 4-33 Comparison of Idaho vs. U.S. GHG Emissions by Sector<sup>a</sup>**

Sector	% of State Total GHG Emissions	% of U.S. GHG Emissions
Transportation	27	26
Agriculture	24	7
Electricity consumption	13	32
Industrial fuel use	11	14
Forestry	10	NA <sup>b</sup>
Residential/commercial fuel use	7.8	9
Waste	3.4	4
Industrial processes	2.1	5
Fossil fuel industry (CH <sub>4</sub> )	1.2	3

<sup>a</sup> All data, calendar year 2000.

<sup>b</sup> At a national level, forests act as a net GHG sink (i.e., absorbing more GHG than they emit) and thus are not displayed as a national GHG emission source.

Sources: CCS, 2008; EPA, 2009b.

1  
2 During each of the 3 peak years of heavy construction, an estimated 590 workers would  
3 commute to and from the proposed site an average daily trip distance of 80.5 kilometers  
4 (50 miles) for 250 days each year. Over the 3-year peak construction period, workforce  
5 commuting would amount to 35,606,736 kilometers (22,125,000 miles). To calculate the  
6 resulting CO<sub>2</sub> emissions associated with workforce commuting, it is assumed that 80 percent of  
7 the vehicles used will be gasoline-fueled with an average mileage of 20 miles per gallon (mpg)  
8 (accounting for 472 daily round trips) and 20 percent of the commuting vehicles will be diesel-  
9 fueled with an average mileage of 15 mpg (118 daily round trips) and that no credit is extended  
10 for busing or carpooling. During each of the 3 peak years, delivery trucks (presumed to be  
11 diesel-fueled long-haul semi-trailer trucks averaging 10 mpg) would make 31 delivery trips per  
12 day (at an average round trip distance of 80.5 kilometers [50 miles]) to transport materials and  
13 equipment and remove wastes, making for 7720 delivery and waste trips for each of the 3 peak  
14 activity years, and traveling a total of 1,870,862 kilometers (1,162,500 miles) over the 3-year  
15 peak heavy construction period. Table 4-35 shows the total amount of CO<sub>2</sub> released from  
16 commuting of the workforce and as a result of delivery vehicle activities.

17  
18 Finally, onsite storage and dispensing of fuels during the period of preconstruction and  
19 construction will result in minor GHG emissions as NMVOCs. AES (2010a) estimates that  
20 approximately 150 gallons each of gasoline and diesel fuels would be dispensed each week  
21 during this period. Applying the EPA algorithm for estimating GHG emissions from fuel handling  
22 (EPA, 2005b) results in estimated annual CO<sub>2</sub> emissions of 73 tons (66 metric tons [MT]) and  
23 83 tons (76 MT) for gasoline and diesel, respectively.

**Table 4-34 CO<sub>2</sub> Emissions from Onsite Fuel Consumption over the Preconstruction and Heavy Construction Period**

Activity	Fuel Type	Fuel Consumption Rate		Total Fuel Consumption		CO <sub>2</sub> Emission Factor (lb/gal)	Total CO <sub>2</sub> Emissions (7 years) (ton)	Annual CO <sub>2</sub> Emissions (ton)			
		(gal/wk)	(liter/wk)	(gal)	(liter)						
Heavy equipment	Gasoline	350	1327	122,500	464,275	19.4	2,3	1188	1078	170	154
	Diesel	10,000	37,900	3,500,000	13,265,000	22.2	2.7	38,850	35,318	5550	5046
Subtotal for onsite fuel consumption								40,038	36,396	5720	5200



**Table 4-35 Emissions from Workforce Commuting and Delivery Activities over the Preconstruction and Construction Period**

Activity	Fuel Type	Total Distances for 3 Peak Yrs		Total Fuel Consumption	CO <sub>2</sub> Emission Factor	Total CO <sub>2</sub> Emissions (3 years of peak construction)	Annual CO <sub>2</sub> Emissions (entire 7-year preconstruction/construction period) <sup>a</sup>				
		(mi)	(km)					(gal)	(liter)	(ton)	(MT)
Commuting traffic	Gasoline	17,700,000	28,485,389	885,000	3,350,089	19.4	2.3	8585	7788	1840	1669
	Diesel	4,425,000	7,121,347	295,000	1,116,696	22.2	2.7	3275	2977	702	638
Delivery truck traffic	Diesel	1,162,500	1,870,862	116,250	440,054	22.2	2.7	1290	1173	277	252
Subtotal for workforce commuting and deliveries		22,125,000	35,606,736	1,180,000	4,466,786			13,149	11,938	2818	2559

<sup>a</sup> To calculate an annual average over the entire 7-year preconstruction and heavy construction period, it is assumed that that the 2 years following the 3-year peak construction period will have activity levels (including workforce reductions) approximately 50 percent of peak years, and the last 2 years of heavy construction will have activity levels (including workforce reductions) 25 percent of peak construction years.

1 Therefore, the total CO<sub>2</sub> emissions expected during preconstruction and heavy construction are:

- 2
- 3 • 5720 tons (5189 MT) per year (averaged) from onsite fuel consumption
- 4
- 5 • 2818 tons (2556 MT) per year from workforce commuting and materials/equipment
- 6 deliveries and waste removals during preconstruction and heavy construction
- 7
- 8 • 8537 tons (7745 MT) per year (averaged) for each year of the 7-year preconstruction and
- 9 heavy construction period
- 10
- 11 • 59,759 tons (54,215 MT) over the entire 7-year preconstruction and heavy construction
- 12 period.
- 13

### 14 **Estimated GHG Emissions during Operation**

15

16 During operation, GHG emissions would result from commuting of the operational workforce,

17 deliveries of feedstock to the proposed facility, deliveries of enriched product to fuel fabrication

18 facilities, return of empty feedstock containers to their points of origin, and delivery of

19 operational wastes to designated offsite disposal facilities. An incidental amount of GHG

20 emissions also results from the onsite storage and dispensing of fossil fuels to support

21 operations.

22

23 A workforce of 550 is assumed to commute a round-trip distance of 80.5 kilometers (50 miles),

24 assuming 250 round trips per year and no credit for carpooling or busing, with a commuting

25 vehicle fleet comprised of 90 percent gasoline-fueled vehicles averaging 20 miles per gallon

26 (mpg) and 10 percent diesel-fueled vehicles averaging 15 mpg. The resulting annual travel

27 distances are 9,957,816 kilometers (6,187,500 miles) for the gasoline-fueled vehicles and

28 1,106,424 kilometers (687,500 miles) for the diesel-fueled vehicles. The total fuels consumed

29 are estimated to be 1,171,112 liters (309,375 gallons) of gasoline and 173,498 liters

30 (45,833 gallons) of diesel.

31

32 Daily deliveries to support facility operation include deliveries of nonradiological materials from

33 vendors in the local area and shipments of nonradiological solid wastes to area landfills;

34 deliveries of (natural) UF<sub>6</sub> feedstock from UF<sub>6</sub> production facilities in Metropolis, Illinois, and Port

35 Hope, Ontario, Canada; delivery of enriched UF<sub>6</sub> product to any of three fuel fabrication facilities

36 in Richland Washington; Wilmington, North Carolina; or Columbia, South Carolina; and

37 shipments of low-level radioactive (process) wastes (LLRW) to the waste disposal facility at

38 Portsmouth, Ohio.<sup>24</sup> Because it is difficult to anticipate the proportion of shipments among the

39 three feedstock suppliers and the three recipients of enriched product, and in order to establish

40 a conservative (worst-case, bounding) scenario of deliveries and shipments with respect to

41 GHG emissions, it is presumed that the longest routes would always be selected, maximizing

42 the total distance traveled by delivery trucks.<sup>25</sup> It is further assumed that separate shipments

43 would be initiated to return empty cylinders and waste containers to their points of origin and

44 that all delivery vehicles will be diesel-fueled with an average mileage of 10 mpg.

45

---

<sup>24</sup> Process-related waste will also be delivered to Oak Ridge, Tennessee; however, those shipments are not included in these GHG emission calculations because the quantities would be very small.

<sup>25</sup> See distances between EREF and each facility in Appendix D, Table D-7.

1 In addition to deliveries and shipments, fossil fuels would be consumed onsite to support  
2 miscellaneous activities: 568 liters (150 gallons) per week each of gasoline and diesel, making  
3 for 28,391 liters (7500 gallons) per year,<sup>26</sup> and a small amount of GHG will be emitted from the  
4 onsite storage and dispensing of fossil fuels. Applications of the operational parameters offered  
5 by AES and the assumptions discussed above result in the estimates of CO<sub>2</sub> emissions during  
6 operation from workforce commuting and deliveries shown in Tables 4-36 and 4-37,  
7 respectively. It is assumed that onsite gasoline and diesel fuel dispensing will occur on  
8 approximately 50 days each year for each fuel, resulting in emissions of 66 MT (73 tons) of CO<sub>2</sub>  
9 from gasoline dispensing and 76 MT (83 tons) of CO<sub>2</sub> from diesel fuel dispensing for an annual  
10 total of 142 MT (156 tons) of NMVOCs released during each year of operation as a result of  
11 onsite fossil fuel handling.

12  
13 The estimated annual emissions of CO<sub>2</sub> from EREF operation, therefore, are 26,136 MT  
14 (28,809 tons).

### 15 16 **Estimated GHG Emissions during Decommissioning**

17  
18 Activities associated with decommissioning are generally described in Section 2.1.4.3. GHG  
19 emissions associated with decommissioning would result primarily from three activities: (1) the  
20 onsite consumption of fossil fuels in vehicles and equipment used to dismantle and in some  
21 cases demolish existing structures or excavate buried utilities and components, (2) the  
22 transportation of waste materials and salvage materials from the proposed site to appropriate  
23 offsite disposal or recycling facilities, and (3) the commuting to the proposed site of the  
24 decommissioning workforce. The absence of a detailed decommissioning plan<sup>27</sup> precludes  
25 detailed quantification of GHG emissions associated with decommissioning. However, AES's  
26 general descriptions of the expected decommissioning strategy and schedule can provide some  
27 insight into potential GHG impacts and allow for the application of conservative assumptions to  
28 estimate bounding conditions.

29  
30 AES has indicated that decommissioning would take approximately 8 years, including a brief  
31 period at the start of decommissioning when limited facility operation is still ongoing. In its Final  
32 SAR (AES, 2010b), AES further estimated the volume of LLRW that would be generated to be  
33 approximately 7700 cubic meters (10,070 cubic yards)<sup>28</sup> and estimated the workforce in the  
34 overlap period to be approximately the same as the operating workforce, 590 individuals.

35

---

<sup>26</sup> The onsite storage of fossil fuels would also result in the release of insignificantly small amounts of NMVOCs from the normal venting of the storage tanks. However, because neither the specific volume nor the chemical speciation of these evaporative losses can be firmly known, resulting GHG emissions cannot be estimated.

<sup>27</sup> A detailed decommissioning plan will be submitted to the NRC near the end of the operating license, in accordance with 10 CFR 70.38.

<sup>28</sup> AES anticipates processing some wastes for the purposes of volume reduction prior to shipments to offsite disposal or recycling facilities (AES, 2010b). However, specific details were not provided and no credit is therefore extended for any anticipated waste volume reductions in this GHG analysis.

**Table 4-36 Annual CO<sub>2</sub> Emissions as a Result of Workforce Commuting during EREF Operation**

Activity	Fuel Type	RT Distance			Total Distances per Year		Total Fuel Consumption		Annual CO <sub>2</sub> Emissions		
		Total Workers	(mi)	(km)	Working Days/y	(mi)	(km)	(gal)	(liter)	(ton)	(MT)
Commuting traffic	Gasoline	495	50	80.5	250	6,187,500	9,957,816	309,375	1,171,112	3001	2722
	Diesel	55	50	80.5	250	687,500	1,106,424	45,833	173,498	509	462
Subtotal of CO <sub>2</sub> emissions from workforce commuting		550				6,875,000	11,064,240	355,208	1,344,610	3510	3184

**Table 4-37 Annual CO<sub>2</sub> Emissions as a Result of Deliveries during EREF Operation**

Material	Origin/ Destination	One-way Trip Distance		Annual Number of Trips		Annual Traveled Distance		Fuel Consumption @10 mpg		Annual CO <sub>2</sub> Emissions	
		(mi)	(km)	Annual Number of Trips	(mi)	(km)	(gal)	(liter)	(ton)	(MT)	
Process-related nonradiological, nonhazardous wastes	Local vendors/ Idaho Falls and vicinity	25	40	3889	194,450	312,937	19,445	73,607	216	196	
(Natural) UF <sub>6</sub> feedstock	Port Pope, Ontario, Canada	2314	3724	1424	6,590,272	10,606,015	659,027	2,494,689	7315	6636	
Enriched UF <sub>6</sub> product	Columbia, SC	2359	3796	516	2,434,488	3,917,929	243,449	921,554	2702	2451	
Depleted UF <sub>6</sub> tails	Portsmouth, OH	2101	3381	1222	5,134,844	8,263,730	513,484	1,943,750	5700	5171	
LLRW	Licensed TSDFs (Oak Ridge, TN)	1907	3068	16	30,512	49,088	3051	11,533	34	31	
Empty feedstock cylinders	Port Pope, Ontario, Canada	2314	3724	712	3,295,136	5,303,007	329,514	1,247,345	3658	3318	
Empty product cylinders	Colombia, SC	2359	3796	516	2,434,488	3,917,929	243,449	921,554	2702	2451	
Empty tails containers	Portsmouth, OH	2101	3381	611	2,567,422	4,131,865	256,742	971,875	2850	2585	
Subtotal of CO <sub>2</sub> emissions related to deliveries				8906	22,651,900	36,454,699	2,265,190	8,574,677	25,177	22,840	

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1 The following are conservative reasonable assumptions that can be made relative to EREF  
2 decommissioning and that can be used to estimate GHG impacts associated with  
3 decommissioning:

- 4
- 5 • CO<sub>2</sub> emissions from shipments of enriched uranium product and operational waste  
6 shipments still occurring during the initial period of decommissioning are treated as  
7 operational GHG impacts.
- 8
- 9 • Shipments of wastes or recycling materials would occur by diesel-fueled trucks averaging  
10 10 mpg.
- 11
- 12 • Annual CO<sub>2</sub> emissions from onsite consumption of fossil fuels is expected to be less than  
13 the average annual emissions of CO<sub>2</sub> experienced during facility preconstruction and  
14 construction, as presented in Table 4-34 above.
- 15
- 16 • LLRW resulting from decontamination activities would be substantially greater in volume  
17 than LLRW resulting from routine EREF operation.
- 18
- 19 • Assuming an average density for the decommissioning waste and an expected weight for  
20 individual shipments, an estimated 4205 shipments of LLRW will occur annually over the  
21 8-year period of decommissioning, for an annual total of 33,640 trip miles to the LLRW  
22 treatment, storage, and disposal facility (TSDF) in Oak Ridge, Tennessee. This will result in  
23 total trip length of 206,415,040 kilometers (128,302,960 miles) and the consumption of  
24 484,985,188 liters (12,830,296 gallons) of diesel fuel, and estimated CO<sub>2</sub> emissions of  
25 129,469 MT (142,416 tons) over the entire decommissioning period.
- 26
- 27 • All nonradioactive and nonhazardous solid wastes are presumed to be delivered to the  
28 same area landfills and treatment facilities that received wastes of similar nature during  
29 EREF operation. Assuming successful decontamination of the majority of EREF equipment  
30 and structures, a significantly higher number of annual trips would occur throughout the  
31 8-year decommissioning phase than would have occurred annually during EREF operation,  
32 and the resulting CO<sub>2</sub> emissions would be at least an order of magnitude greater than the  
33 values for such waste shipments appearing in Table 4-37.
- 34
- 35 • All nonradioactive hazardous waste generated during EREF operations would already have  
36 been delivered to permitted TSDFs, and the CO<sub>2</sub> emissions of such deliveries would be  
37 credited to the EREF operational phase. The amount of nonradioactive hazardous waste  
38 newly generated as a result of decommissioning activities is expected to be very small and  
39 would likely be delivered to the same TSDF that received similar waste during EREF  
40 operation. It is further assumed that an appropriately permitted TSDF will be located within  
41 a reasonable distance from the proposed EREF, resulting in limited amounts of GHG  
42 emissions from transport.
- 43
- 44 • Except for the brief period at the beginning of decommissioning when some operations are  
45 still ongoing, the decommissioning workforce is expected to be similar in size to the  
46 operational workforce – 550 individuals. For the early years of decommissioning,  
47 parameters of workforce commuting are therefore assumed to be the same as those  
48 described above for commuting impacts during operation, resulting in an annual release of

1 CO<sub>2</sub> related to workforce commuting similar in magnitude to the values displayed in  
2 Table 4-36 above, 3184 MT (3510 tons). In the early years when operations and  
3 decommissioning are coincident, CO<sub>2</sub> emissions from workforce commuting are expected to  
4 be proportionally higher.  
5

### 6 **Indirect Positive Impacts from EREF Facility Operation**

7

8 Nuclear power generated with fuel fabricated from the enriched uranium generated at the  
9 proposed EREF would indirectly displace GHG emissions that would otherwise be released  
10 from fossil-fueled power plants. Accordingly, enriched UF<sub>6</sub> produced at the proposed EREF can  
11 be thought of as indirectly helping to avoid GHG emissions. AES estimates that, at full  
12 production, the proposed EREF would produce approximately 2252 metric tons (2482 tons) of  
13 enriched UF<sub>6</sub> annually, which would be equivalent to 1727 metric tons (1904 tons) of UO<sub>2</sub> fuel.  
14 A typical 1100-MWe pressurized water reactor (PWR) would have approximately 98 MT  
15 (108 tons) of UO<sub>2</sub> in its core (Nero, 1979). Thus, annual production of the proposed EREF  
16 could replace the fuel cores of 17.9 PWRs. Operating at a capacity factor of 95 percent, each  
17 PWR would be capable of producing 8322 megawatt hours per year (MWh/yr). Thus the total  
18 amount of power associated with the proposed EREF's annual enriched UF<sub>6</sub> production would  
19 be 146,467 MWh/yr.  
20

21 In 2005, emission factors for CO<sub>2</sub> from coal-burning power plants ranged from a minimum of  
22 1341.64 pounds per megawatt hour to a maximum of 2449.43 pounds per megawatt hour, with  
23 the U.S. composite value (representing an average of all operating coal plants) of  
24 2134.64 pounds per megawatt hour (EPA, 2009b).<sup>30</sup> Thus, displacing power from coal-burning  
25 power plants with an equivalent amount of power produced in nuclear reactors from fuel  
26 fabricated from an annual amount of EREF-enriched UF<sub>6</sub> would have prevented the release of  
27  $3117 \times 10^6$  pounds of CO<sub>2</sub>, or 1.42 million metric tons (1.56 million tons).  
28

### 29 **Carbon Dioxide and Other GHG Emissions Summary**

30

31 Using calendar year 2005 as a reference point (the latest year for which Idaho GHG emission  
32 data are available), and as shown in Table 4-33, total net CO<sub>2</sub> emissions for Idaho for the year  
33 2005 were 36.0 million metric tons of CO<sub>2</sub> equivalents. For the United States for that same  
34 year, total net CO<sub>2</sub> emissions were 5985.9 million metric tons (6584.5 million tons)  
35 (EPA, 2009a). By comparison, during all of the 3 peak activity years of construction, EREF CO<sub>2</sub>  
36 emissions are projected to be 11,929 metric tons (13,149 tons), or 0.03 percent of Idaho's  
37 statewide output and 0.0002 percent of the projected nationwide CO<sub>2</sub> emissions for the same  
38 period.  
39

40 During any typical year of EREF operation, CO<sub>2</sub> emissions are projected to be 26,136 MT  
41 (28,809 tons), approximately 0.07 percent of the Idaho statewide output or 0.00044 percent of  
42 the nationwide emissions for calendar year 2005. The NRC staff concludes that, even without  
43 giving credit to the proposed EREF for contributing to the avoidance of CO<sub>2</sub> emissions as

---

<sup>30</sup> Coal-burning power plants in Idaho had the lowest CO<sub>2</sub> emission factor in 2005; however, because fuel fabricated from EREF-enriched uranium could conceivably be installed in any nuclear reactor operating within the North American Electric Reliability Corporation (NERC) geographic area of authority, the composite emission factor is the most representative value for use in this comparison.

1 discussed above, impacts from the preconstruction, construction, operation, and  
2 decommissioning of the proposed EREF from the emissions of CO<sub>2</sub> and other GHGs would be  
3 SMALL.  
4

#### 5 **4.2.18 Terrorism Consideration**

6  
7 This section discusses the potential environmental impacts of a hypothetical terrorist attack at  
8 the proposed EREF. The terrorism threats that were considered are associated with releases to  
9 the environment of radioactive and hazardous material at the proposed EREF and of radioactive  
10 and hazardous material transported to and from the proposed EREF. In this terrorism analysis,  
11 radioactive and hazardous material includes natural, enriched, and depleted uranium (all as  
12 UF<sub>6</sub>) that would be present in large quantities during onsite storage and shipment to and from  
13 the proposed EREF site.  
14

##### 15 **4.2.18.1 Background Information**

16  
17 In its *Notice of Hearing and Order* in the matter of the proposed AES EREF (74 FR 38052,  
18 July 30, 2009) (NRC, 2009c), the Commission directed, and provided relevant guidance to, the  
19 NRC staff to address in the EIS the environmental impacts of a terrorist attack at the proposed  
20 EREF. Consistent with the Commission's guidance, the terrorism consideration presented  
21 herein has been developed using available information in agency records and other available  
22 information on the proposed EREF design, mitigations, and security arrangements that have a  
23 bearing on likely environmental consequences, in accordance with the requirements of NEPA  
24 and the regulations for the protection of sensitive unclassified and classified information.  
25

26 Also, consistent with the Commission's guidance, this terrorism consideration relies on as much  
27 publicly available information as practicable and makes public as much of its environmental  
28 analysis as feasible recognizing, however, that it may prove necessary to withhold certain NRC  
29 staff findings and conclusions as sensitive unclassified and classified information. In addition,  
30 the analysis relies, where appropriate, on qualitative rather than quantitative considerations.  
31

32 In the case of the proposed EREF, the terrorism consideration uses publicly available  
33 information from accident analyses conducted for the proposed facility and similar facilities, as  
34 well as certain security-related information not available to the public. Whether the release of  
35 radioactive and hazardous material into the environment occurs because of an explosion or  
36 other cause due to an accidental sequence of events or to a series of premeditated terrorist  
37 activities, the results would be similar given an explosion or other incident of the same  
38 magnitude and the same amount of material involved, regardless of the initiating event. Thus, a  
39 range of potential impacts from hypothetical terrorist acts can be estimated from a range of  
40 potential accidents with similar characteristics and consequences, as further discussed below.  
41

42 Section 4.2.18.2 discusses potential terrorism impacts, and Section 4.2.18.3 discusses  
43 mitigative measures intended to defeat a terrorist attack and reduce potential consequences.  
44

##### 45 **4.2.18.2 Potential Impacts of Terrorist Events**

46  
47 Terrorist events leading to the dispersion of radioactive and hazardous material into the  
48 environment could occur during transportation of such materials to or from the proposed EREF

1 or at the proposed EREF site. In either case, impacts ranging from minor incidents to wider  
2 spread releases of contamination are possible. As discussed below, the resulting quantities of  
3 radioactive and hazardous material potentially released by a terrorist event would be similar to  
4 those for transportation accidents as analyzed in this EIS in Section 4.2.9.2 and in Appendix D,  
5 Section D.5, and for facility accidents as analyzed in Section 4.2.15.  
6

7 Unlike the accident analysis, which considers potential accidents with some likelihood of  
8 occurrence, the consideration of terrorist events provides an estimate of the potential  
9 consequences of such events without attempting to assess the likelihood that any one specific  
10 scenario would be attempted or would succeed. There are limitless potential scenarios  
11 involving a specific initiating event whereby radioactive and hazardous material could be  
12 released as a result of a terrorist attack. The likelihood of occurrence of any terrorist scenario is  
13 speculative and cannot be determined. However, there are certain classes of events that may  
14 be identified and qualitatively analyzed to provide estimates of a potential range of impacts.  
15 In addition, any estimate of the likelihood of a terrorist attack would not account for any security  
16 measures that might be implemented to assist in the prevention of such attacks. Thus, the  
17 comparison of terrorist events with accidents in the following sections addresses the potential  
18 consequences should a terrorist act occur and does not discuss the likelihood of such events.  
19

20 As part of the analysis, a literature review of available studies by the NRC and DOE was  
21 conducted, which considered potential accidents at current or proposed uranium enrichment  
22 facilities. The consequences associated with these potential accidents were reviewed and  
23 compared against potential consequences from terrorist attacks at the proposed EREF and at  
24 other uranium enrichment facilities.  
25

## 26 **Transportation Impacts**

27

28 A terrorist attack on vehicles transporting radioactive and hazardous material to and from the  
29 proposed EREF would result in the threat for partial or complete release of transported material  
30 to the environment. The consequences of such a terrorist act depend on the quantity of  
31 material that could be released, on the chemical, radiological, and physical properties of the  
32 material involved, how it is packaged, and its ease of dispersion. Consequences also depend  
33 on the surrounding environment, land use, and population density in the vicinity of the event.  
34 Radioactive and hazardous material would be transported through areas of varying population  
35 density and land use, to the proposed EREF as natural uranium in 14-ton 48Y cylinders and  
36 from the proposed EREF as enriched uranium in 2.5-ton 30B cylinders (in protective Type B  
37 overpacks) and depleted uranium in 48Y cylinders.  
38

39 A number of studies have been published by DOE on the potential impacts should these types  
40 of shipments become involved in a serious accident (DOE, 1999, 2004a,b). In these studies,  
41 accident scenarios were characterized by extreme mechanical and thermal forces. In all cases,  
42 these accidents would result in a release of radioactive and hazardous material to the  
43 environment. The accidents corresponding to those with the highest accident severity represent  
44 low-probability, high-consequence accident events. Regardless of the initiating event, the  
45 highest potential impacts from terrorist acts would be similar to severe transportation accident  
46 impacts.  
47

1 To account for terrorist events that could occur in a range of population densities, the impacts  
2 have been estimated for generic rural, suburban, and urban locations with assumed population  
3 densities of 6 persons/km<sup>2</sup>, 719 persons/km<sup>2</sup>, and 1600 persons/km<sup>2</sup>, respectively. From  
4 accident consequence estimates (DOE, 2004a), the collective population dose from a single,  
5 14-ton 48Y cylinder shipment of depleted UF<sub>6</sub> (one cylinder per truck) involved in a severe  
6 accident in a highly populated urban area corresponds roughly to one latent cancer fatality.  
7 Impacts in rural and suburban areas would be lower because of their lower population densities  
8 (DOE, 2004a). Acute fatalities from radioactive exposure to depleted UF<sub>6</sub> are not expected  
9 under any scenario. Impacts from a similar incident involving a natural uranium shipment are  
10 expected to be approximately the same because natural uranium is also shipped in  
11 48Y cylinders (one per truck).

12  
13 In addition, a severe transportation incident would restrict the use of the affected road and of  
14 surrounding land, homes, and businesses that would have been contaminated from the incident.  
15 Use of the land, housing, or businesses would resume after completion of cleanup activities and  
16 permission for use is allowed by authorities.

17  
18 Socioeconomic impacts will depend on the location of the event along the transportation route  
19 within a generic rural, suburban, and urban area. The specific use of the area (e.g., agricultural,  
20 retail, service, commercial, industrial (manufacturing), residential, or mixed use) will determine  
21 the specific socioeconomic impacts in the affected area. The temporary closing of businesses  
22 will have direct and indirect impacts on the employment from these businesses, which is  
23 expected to last until cleanup activities are complete. In addition to loss of employment, other  
24 impacts could occur. For example, in the case of manufacturing or agricultural areas, the loss  
25 of material goods or produce that would have been generated during the cleanup period could  
26 result in higher cost of goods in the area due to a loss in supply; contaminated housing could  
27 result in relocation of residents until cleanup efforts are complete; or a contaminated  
28 transportation link (e.g., a subway station) could result in disruption of the commuter network  
29 while cleanup activities are under way.

30  
31 Acute chemical fatalities from exposure to HF formed following a release of UF<sub>6</sub> would be  
32 possible, depending on the proximity of the nearest individuals. For the same potential incident,  
33 DOE (2004a) estimated that as many as several to several hundred or more adverse impacts  
34 could occur, but only up to three irreversible adverse health effects were estimated. Adverse  
35 effects range from mild and transient effects, such as respiratory irritation or skin rash  
36 (associated with lower chemical concentrations), to irreversible (permanent) effects which could  
37 include death or impaired organ function (associated with higher chemical concentrations). For  
38 exposures to uranium and HF, it was estimated that the number of fatalities occurring would be  
39 about 1 percent of the number of irreversible adverse effects (DOE, 1999); therefore, in this  
40 case no fatalities are expected.

41  
42 Similar impacts would be expected from terrorist events involving shipments of natural or  
43 enriched uranium. The UF<sub>6</sub> enrichment results in no additional effect on any potential chemical-  
44 related impacts, nor is it expected to have any significant effects on the radiological impacts,  
45 because of the relatively small amount of U-235 compared to that of U-238.

46  
47 According to AES (2010a), shipments involving enriched uranium would occur with two  
48 cylinders per truck in smaller (2.5-ton) Type 30B cylinders in protective Type B overpacks,



1 resulting in a reduced amount of UF<sub>6</sub> released as the result of a severe terrorist incident.  
2 Therefore, the results from a terrorist act involving a shipment of natural or enriched uranium is  
3 expected to be less than that from a depleted uranium shipment. Appendix D of this EIS  
4 includes a discussion of the differences between the shipping configurations for the different  
5 types of cylinders.  
6

## 7 **Facility Impacts**

8

9 Section 4.2.15 of this EIS discusses potential accidents considered at the proposed EREF and  
10 the resulting health effects. The accidents evaluated are representative of the types of  
11 accidents that are possible at a uranium enrichment facility, covering a range of initiating events.  
12 The consequences of these events are directly affected by the type and amount of material  
13 released at different locations at the proposed EREF. Therefore, similar consequences are  
14 expected from similar incidents involving the same material resulting from a terrorist attack.  
15 Thus, consequences from potential accidents discussed in Section 4.2.15, including health  
16 effects to workers and the public, are also applicable to potential terrorist attacks.  
17

18 Chemical impacts to workers at the proposed EREF associated with a potential terrorist attack  
19 could range from no adverse effects to adverse effects to the majority of workers. Similarly,  
20 DOE (1999) estimated that chemical impacts to members of the general public could range from  
21 no adverse health effects to adverse health effects to less than 1900 members of the public.  
22 However, it is expected that much fewer than 1900 members of the public could be affected in  
23 the vicinity of the proposed EREF because the DOE analysis was for a location with a higher  
24 population density (>34,000 people within 16 kilometers [10 miles]) than that of the proposed  
25 EREF location, which has no appreciable population within 16 kilometers [10 miles]  
26 (see Table 4-22).  
27

28 A terrorist attack on the proposed EREF that causes a release of UF<sub>6</sub> to the air would result in  
29 an airborne contamination plume in the prevailing wind direction during the release. The plume  
30 would eventually precipitate and settle on the ground surface. The resulting areal extent of the  
31 ground contamination would depend on the wind speed and degree of vertical mixing (stability  
32 class) during the release. In any case, the extent of the plume containing uranium compounds  
33 and ground contamination would be limited by the expected high deposition rate of uranium in  
34 any chemical form. UF<sub>6</sub> would be rapidly converted to particulate uranyl fluoride (UF<sub>2</sub>O<sub>2</sub>)  
35 through reaction with moisture in the air. HF, which is also produced in this reaction, would not  
36 have any residual effects following an incident because of its relatively low concentration and  
37 because it will quickly react in air or upon deposition. However, dependent on the amount of  
38 UF<sub>6</sub> released, the airborne HF plume generated in the vicinity of the release point could cause  
39 fatality to humans and animals from inhalation, but would rapidly disperse downwind. Lethal air  
40 concentrations of HF immediately following a release of UF<sub>6</sub> would not be expected at the  
41 proposed EREF site boundary as supported by the results of the accident analysis in  
42 Section 4.2.15.  
43

44 Uranium contamination deposited on the ground would be initially confined to a thin surface  
45 layer on vegetation and surface soil. Uranium concentrations in soil and vegetation near the  
46 release point would be expected to be similar to those measured following the accidental  
47 rupture of 14-ton cylinders containing liquid UF<sub>6</sub> at fuel cycle facilities (DOE, 1978; NRC, 1986).  
48 Based on this historical data and supported by atmospheric dispersion models, a plume might

1 be expected to extend on the order of 1 to 2 kilometers (0.6 to 1.2 miles) in the primary wind  
2 direction, with rapidly decreasing contaminant concentrations moving away from the source.  
3 For the proposed EREF, the highest ground and vegetation concentrations would be expected  
4 to be confined to the proposed EREF property because of the large distance from the proposed  
5 facility to the property boundary. The resultant environmental concentrations beyond a few tens  
6 of meters from the release point after the plume has passed by and deposition has occurred  
7 would not be expected to cause any long-term chemical or radiological effects to humans,  
8 wildlife, or vegetation. In the short term, resuspension of uranium particulates could result in a  
9 small inhalation hazard, but weathering processes (e.g., wind and precipitation) would be  
10 expected to reduce average concentration levels. However, some concentration of the uranium  
11 could occur in certain areas due to preferential flow of water runoff during heavy precipitation  
12 events.

13  
14 The actual extent of any plume would be determined with high precision using appropriate  
15 radiation surveys following an incident. The amounts of uranium and HF directly deposited on  
16 plants near the release point would be measured and the consumption of vegetation by humans  
17 and/or animals restricted as necessary (NRC, 1986). The restrictions in consumption would  
18 occur for a defined time interval and would be removed after new measurements indicate safe  
19 use of vegetation by humans and/or animals. In addition, if necessary, exposures to the public  
20 would be prevented by restricting access. Survey data would be used to compute risks to the  
21 public and environment, and appropriate cleanup actions would be taken. Exposure analysis  
22 would include direct and indirect pathways, including food chain analyses.

23  
24 Cleanup conducted in a timely manner would minimize migration of contamination to greater soil  
25 depths or to surface water or groundwater. Little or no surface water exists in area of the  
26 proposed EREF, which is primarily rangeland and farmland. Depending on the extent of the  
27 contamination, cleanup could include decontamination and repair of damaged equipment and  
28 buildings, possible excavation of a thin surface layer of soil, and removal of vegetation. Wastes  
29 from cleanup activities would be shipped offsite for disposal at a licensed low-level waste  
30 facility. Such cleanup would reduce residual risks to acceptably low levels, likely to background  
31 levels if soil were removed. Depending on the extent of the contamination and damage,  
32 cleanup costs could reach into the tens of millions of dollars or more for decontamination and  
33 cleanup of the local area, costs for repair of damaged facilities, (DOE, 2007; see Appendix H for  
34 construction costs), and remediation of the surrounding area, if uranium and soil concentrations  
35 in soil and vegetation are considered excessive.

36  
37 A terrorist act would interrupt facility operations until the essential cleanup activities are  
38 complete. This would have an impact on the economic activity in the area because people  
39 would be out of work for the duration of the cleanup activities. At the same time, some  
40 economic activity will take place, such as employment of workers to conduct the cleanup  
41 activities. The duration of these cleanup activities and the number of personnel required would  
42 depend on the severity of the contamination.

#### 43 **4.2.18.3 Mitigative Measures**

44  
45 Mitigative measures proposed for potential releases under accident conditions as described in  
46 Section 4.2.15.3 would also be applied, as appropriate, as mitigative measures against terrorist  
47 attack. Such measures identified by AES include, but are not limited to, process system(s) and  
48

1 building construction designed to minimize the quantity of radioactive material at any given  
2 location and to isolate that material from the outside environment and detection and alarm  
3 systems for radiation and fire hazards, in conjunction with barriers designed to prevent the  
4 spread of material within the proposed facility (AES, 2010c). While adversaries might seek to  
5 defeat some of the listed elements of the mitigative controls, the protective system would be  
6 designed to provide defense-in-depth and would be robust to limited degradation.

7  
8 Prior to operation of the proposed EREF, AES would also be required to fully implement security  
9 measures required by 10 CFR Parts 73, 74, and 95 of the regulations and additional security  
10 requirements issued by order. The NRC anticipates imposing additional security measures on  
11 AES to address the current threat environment (NRC, 2010e). Under the additional security  
12 measures, AES would need to identify critical target areas, if any, and provide a means for  
13 protecting these areas. Critical target areas would be determined based on hazards related to  
14 licensed radioactive materials. In addition, these measures would include, for example,  
15 information protection, personnel trustworthiness and access authorization, material control and  
16 accounting, and physical protection systems and programs. Compliance with these security  
17 measures would mitigate potential consequences of adversary actions.

### 18 19 **4.3 Cumulative Impacts**

20  
21 The CEQ regulations implementing NEPA define cumulative impacts, or effects, as “the impact  
22 on the environment which results from the action when added to other past, present, and  
23 reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or  
24 person undertakes such other actions” (40 CFR 1508.7). In the following analysis, cumulative  
25 impacts are assessed from the anticipated impacts of the proposed EREF project when added  
26 to other identified projects, facilities, or activities in the region that have impacts that affect the  
27 same resources or human populations. Effects from the various sources may be direct or  
28 indirect and they may be additive or interactive. Such effects are assessed that, when on their  
29 own, may be minor, but in combination with other effects may produce a cumulative effect that  
30 is of greater concern.

31  
32 To identify the activities in the region that could contribute to cumulative impacts, an ROI was  
33 defined for each resource that is expected to be impacted by the proposed EREF project. An  
34 ROI for a particular resource is the size of the surrounding area within which impacts from  
35 multiple sources may be additive or interactive. The sizes of the ROIs may be different for  
36 various resources, and some resources may be remote from the proposed site, such as a waste  
37 disposal facility or a receiving water body downstream of the proposed project. Still others  
38 might cover large areas, such as a watershed or airshed. The resource ROIs are discussed  
39 further later in this section. For the proposed EREF, an ROI radius of 16 kilometers (10 miles)  
40 was identified for all resources except socioeconomics, for which an ROI radius of 80 kilometers  
41 (50 miles) was identified. Impacts on the full extent of the resources affected, such as an  
42 ecoregion, were analyzed, even if the resource extends beyond the identified ROIs.

43  
44 A search was conducted to identify projects or activities in the region that would contribute to  
45 cumulative effects. This review included existing activities in the region that would affect the  
46 same resources as the proposed EREF project, known past impacts on these resources, and  
47 reasonably foreseeable proposed new projects, activities, or facilities that would impact these  
48 resources. Foreseeable development in the region was assessed through consultation with

1 local development boards and agencies with which proposed plans for projects must be filed.  
2 Past impacts have resulted primarily from the development of agriculture in the region and the  
3 development of the INL near the proposed project site. The main INL facilities lie outside the  
4 16-kilometer (10-mile) ROI, but within the 80-kilometer (50-mile) ROI for socioeconomics.

5  
6 Impacts from preconstruction activities for the proposed EREF are addressed as cumulative  
7 impacts in this EIS, as these actions are not part of the proposed action. These impacts are  
8 discussed within the various resource area discussions in Section 4.2 so that they can be  
9 presented alongside similar impacts from construction of the proposed facility, which are part of  
10 the proposed action. For the purposes of cumulative impacts analysis in this EIS,  
11 preconstruction activities are considered past activities because they occur prior to the main  
12 aspects of facility construction and prior to facility operation.

13  
14 Also considered in this section is the construction and operation of the proposed 161-kilovolt  
15 (kV) electrical transmission line and associated substation installation and upgrades to provide  
16 electrical power for the operation of the proposed EREF. Rocky Mountain Power (RMP)  
17 proposes to build a 161-kV transmission line that would extend westward from the existing  
18 Bonneville Substation 14.5 kilometers (9 miles) along an existing 69-kV transmission line ROW  
19 to the existing Kettle Substation near the proposed EREF site and continue a total  
20 7.6 kilometers (4.75 miles) further to the proposed new Twin Buttes Substation within the  
21 proposed EREF property, a total length of 22.1 kilometers (13.75 miles). This proposed project  
22 would involve a rebuild/replacement of the 14.5-kilometer (9-mile) long 69-kV line portion to  
23 include a double circuit line, with one side energized at 69 kV and the other side at 161 kV to  
24 provide service to the proposed Twin Buttes Substation. The proposed Twin Buttes Substation  
25 will be located within a 15-acre area on the proposed EREF site that would be excavated during  
26 preconstruction activities. The proposed project would also include modifications at the  
27 Bonneville Substation. The details of the route as well as other critical parameters of the  
28 transmission line construction that would impact air quality are contained in Appendix H to the  
29 EREF ER (AES, 2010a), and the proposed transmission line is further described in  
30 Section 2.1.3.2.

31  
32 No additional ongoing or planned developments were identified within 16 kilometers (10 miles)  
33 ROI of the proposed project location. However, several ongoing and proposed developments  
34 within 80 kilometers (50 miles) have been identified that could contribute to a regional  
35 socioeconomic impact in combination with the proposed project. A listing of these projects and  
36 potential cumulative socioeconomic impacts are presented in Section 4.3.12 below. Among  
37 these is the proposed Mountain States Transmission Intertie, a proposed 500-kV transmission  
38 line running between western Montana and southeastern Idaho (NorthWestern Energy, 2008).  
39 The project is currently undergoing environmental review under NEPA. The preferred route lies  
40 approximately 40 kilometers (25 miles) to the west of the proposed EREF site, running north-  
41 south. Two alternate routes lie closer, the nearest running adjacent to the western boundary of  
42 the proposed EREF property just outside of INL property, and the other route crossing US 20  
43 about 10 miles east of the proposed EREF site. Construction of this transmission line is  
44 planned to begin in 2010 and be completed in early 2013, with service starting in 2013.  
45 Assuming that the preferred route will be selected, cumulative impacts would occur only to  
46 socioeconomics in the region. If one of the closer alternative routes is selected, cumulative  
47 impacts on other resources would have to be considered.

1 The following sections present assessments of the potential cumulative impacts of the  
2 construction and operation of the proposed EREF for each resource area. Under the no-action  
3 alternative, the proposed site would continue to be used for agriculture and cumulative impacts  
4 would be equivalent to current impacts and generally less than those for the proposed action,  
5 except in terms of local job creation. Therefore, except for socioeconomic impacts, the  
6 cumulative impacts of the no-action alternative are not discussed in detail.

#### 7 8 **4.3.1 Land Use** 9

10 The EREF is being proposed on private land located in a remote location. The area is zoned for  
11 grazing, which in Bonneville County allows for industrial activities such as construction and  
12 operation of a uranium enrichment facility. Cumulative land use impacts would result if land use  
13 designations were altered through incremental development. The proposed EREF project is  
14 consistent with other development that has occurred in the county on INL land under the current  
15 zoning. No future development activities are reasonably foreseeable that would result in a  
16 cumulative alteration to land use designations. Therefore, cumulative land use impacts would  
17 be SMALL.

18  
19 The proposed installation of the 161-kV transmission line to power the proposed EREF would  
20 be entirely on private land (AES, 2010a). Current land use within the proposed transmission  
21 line corridor is agricultural and open rangeland (USGS, 2009), and is not expected to be  
22 restricted as a result of the installation of the transmission line. Cumulative land use impacts  
23 associated with the construction and operation of the proposed transmission line would be  
24 SMALL.

#### 25 26 **4.3.2 Historic and Cultural Resources** 27

28 The proposed EREF would be constructed on private land in a remote location. No additional  
29 development is currently known for the region. The Wasden Complex archaeological site is  
30 located in the general vicinity of the proposed EREF. In the event that additional development  
31 did take place, there could be the potential for impacts to occur to the viewshed associated with  
32 this significant historic and cultural resource. Cumulative impacts could also occur to historic  
33 and cultural resources if a particular site type was systematically removed. The significant  
34 cultural resource site known on the proposed EREF site, site MW004, is a historic homestead.  
35 This site type is found throughout the region (Gilbert, 2010), and the potential for this site type to  
36 be removed entirely from the region is unlikely. Therefore, cumulative impacts to historic and  
37 cultural resources would be SMALL.

38  
39 The Area of Potential Effect (APE) for the proposed 161-kV transmission line project is  
40 202.3 hectares (500 acres) for the line itself. The fenced area at the proposed modified  
41 Bonneville Substation is 1.3 hectares (3.1 acres), and the proposed new Twin Buttes Substation  
42 on the proposed EREF site itself would occupy a 2.1-hectare (5.2-acre) fenced area. Portions  
43 of the proposed Twin Buttes Substation and of the proposed transmission line adjacent to the  
44 proposed EREF were surveyed previously as part of the survey for the main portion of the  
45 proposed EREF site (Ringoff et al., 2008). Site MW004 was identified during this survey near  
46 the location of the proposed Twin Buttes Substation. See Section 4.2.2.1 for a discussion of the  
47 effects on the site MW004 and the mitigation approach. The ROW for the proposed 161-kV  
48 transmission line has been surveyed for the presence of historic and cultural resources



1 (Harding, 2010). The survey examined the 202.3-hectare (500-acre) APE which is derived from  
2 the 22.12-kilometer (13.74-mile) transmission line and 45.72 meters (150 feet) on either side of  
3 the centerline (91.4-meter [300-foot] total width). No historic and cultural resources were  
4 identified in these surveys. It is currently unclear whether additional areas would be needed for  
5 some aspects of the transmission line construction (e.g., pulling and tensioning sites). AES has  
6 stated that an unanticipated discoveries and monitoring plan will be in place during construction  
7 (AES, 2010e). Consultation between the NRC and the Idaho SHPO is ongoing concerning  
8 historic and cultural resources along the proposed transmission line ROW and at the  
9 substations (NRC, 2010b). The Shoshone-Bannock Tribes was also contacted to determine if it  
10 had issues of importance to the tribe concerning the proposed transmission line project  
11 (NRC, 2010c).

### 13 **4.3.3 Visual and Scenic Resources**

15 Cumulative impacts to visual and scenic resources would occur if additional development  
16 resulted in a significant change in the visual qualities of the region. No additional development  
17 is planned for the region. In the event that additional industrial development occurred in the  
18 vicinity of the proposed EREF, it could have a negative impact on the scenic qualities of the  
19 Wasden Complex archaeological site and the Hell's Half Acre WSA. The natural character of  
20 the area is currently intact. A series of industrial developments could alter the visual qualities of  
21 the area, which would not be consistent with the BLM VRM class currently in place for the Hell's  
22 Half Acre WSA. However, no additional development is reasonably foreseeable for the area;  
23 therefore, the cumulative impact would be SMALL.

25 The proposed transmission line to be constructed for the proposed EREF has the potential to  
26 affect visual and scenic resources. The proposed transmission line largely follows an existing  
27 ROW for an existing 69-kV line. The proposed transmission line is a 161-kV line that will  
28 replace the 69-kV line. It will be mounted on poles that can be as much as 24.4 meters (80 feet)  
29 tall (AES, 2010a). The new transmission line would be plainly visible from US 20. However,  
30 there are no specific key observation points along most of the route. The closest key  
31 observation point is the trailhead for the Twenty Mile Trail at the Hell's Half Acre WSA, but most  
32 of the proposed transmission line would not be visible from this trailhead. The only portion of  
33 the proposed line that would be visible is where this line enters the proposed EREF site. The  
34 cumulative visual impact from the proposed transmission line would be SMALL.

### 36 **4.3.4 Air Quality**

38 Some expansions of local businesses can be expected to occur in support of construction and  
39 operation of the proposed EREF. However, the air impacts from such expansions are expected  
40 to be negligible. No other major facility is expected to be constructed in the local area  
41 specifically to support, or as a direct result of, EREF operations. However, operation of the  
42 proposed EREF would result in increased energy requirements for the local area. Air impacts  
43 could result from expansions of existing sources of energy generation or construction of new  
44 energy generating sources to meet increased electricity demands or as a result of modifications  
45 to electricity distribution networks. However, no specific plans are known to exist for any such  
46 activities, so it is not possible to quantify the air impacts to the local airshed. Activities at the  
47 preexisting major sources of air pollution in the four-county area (see Section 3.5.3.2) are not

1 expected to be affected by the construction and operation of the proposed EREF, and extant  
2 emissions of criteria pollutants from those major sources are expected to remain unchanged.

3  
4 To provide electrical power to the proposed EREF, RMP proposes to build a 161-kV  
5 transmission line as discussed earlier in Section 2.1.3.2. Air quality impacts associated with  
6 construction of this transmission line would include the release of criteria pollutants from the  
7 operation of reciprocating internal combustion engines of the construction vehicles and  
8 equipment, the delivery trucks that bring components to the job site, and the vehicles used by  
9 the construction workforce to commute to and from the job site (AES, 2010a). Fugitive dust  
10 would be created during construction of access roads, vegetation clearing of the proposed  
11 transmission line ROW and ground clearing and/or grading to create equipment laydown areas  
12 and staging areas for cranes and conductor pulling/tensioning equipment, and ground clearing  
13 and excavations associated with constructing foundations for the support towers. Similar  
14 impacts would occur during construction of new or modified substations. Some additional  
15 criteria pollutant emissions and fugitive dust would be associated with ancillary activities such as  
16 production of concrete for foundations. During operation, air impacts would result from vehicles  
17 traveling to and within the ROW for regular inspections, repairs, and occasional component  
18 replacements and from corona discharges from the conductors that would produce negligible  
19 amounts of ozone and nitrogen oxides (AES, 2010a).

20  
21 According to AES (2010a), critical aspects of the planned construction from an air quality  
22 perspective include: a relatively small workforce (6–8 persons), a relatively short construction  
23 time frame (4 months for the proposed transmission line, 6 months to complete construction of  
24 the proposed Twin Buttes Substation and necessary upgrades to the Bonneville Substation), the  
25 relatively short commute of the workforce (from a hotel in Idaho Falls, a distance of 25 miles or  
26 less to any point along the proposed route or to a substation location), foundations for towers  
27 constructed with minimal ground surface disturbance (augered holes, backfilled with excavated  
28 materials and without concrete) (AES, 2010a). Also, RMP has proposed the use of mitigative  
29 measures such as watering the disturbed ground in construction areas and the unpaved access  
30 roads to reduce fugitive dust generation. Finally, except for one new unpaved 500-foot  
31 (152.4-meter) access road, existing paved roads and construction roads on the proposed EREF  
32 property would provide sufficient access to the ROW. Given the topography of the proposed  
33 route, the amount of grade alteration that would be required to create level areas for staging of  
34 cranes and conductor pulling/tensioning equipment is expected to be minimal. All of the  
35 scheduled construction activities that would result in air impacts are of relatively modest  
36 proportion and limited duration. Further, many of the air impacting activities typically associated  
37 with transmission line construction such as access road construction would occur to a very  
38 limited extent. The NRC staff concludes, therefore, that the air impacts from construction of the  
39 proposed transmission line would be of short duration and would be SMALL.

40  
41 According to AES (2010a), during operation the proposed transmission line would undergo  
42 scheduled visual inspection once every two years with inspectors traveling from Shelly, Idaho,  
43 eight miles southwest of Idaho Falls. Maintenance actions would also result in the release of  
44 criteria pollutants and fugitive dust resulting from vehicle travel on access roads and within the  
45 ROW. Pole inspections would occur on a 10-year interval (AES, 2010a). It is reasonable to  
46 assume that pole replacements (similar in air impacts to initial construction) would occur only  
47 rarely, when found to be necessary. Given the nominal voltage of the line (161 kV), corona  
48 discharges that would result in the formation of ozone and nitrogen oxides would be negligible.

1 The NRC staff concludes that air impacts associated with operation of the proposed  
2 transmission line would be SMALL.

3  
4 The NRC staff concludes that cumulative impacts to air quality from the construction and  
5 operation of the proposed EREF and from construction and operation of the proposed  
6 transmission line serving the proposed site would be SMALL.

#### 7 8 **4.3.5 Geology and Soils**

9  
10 The proposed EREF site is located in a region predominantly used for irrigated crops and  
11 grazing. Contamination of soils and the underlying aquifer have been reported at the INL site,  
12 just to the northwest of the proposed site (EPA, 2009c). Other sources of contamination in the  
13 region include animal feedlots, land applications (fertilizer, pesticide, wastewater, and sludge),  
14 storage tanks, waste tailings, landfills, and industrial facilities. Excessive irrigation in the region  
15 increases the potential for soil contaminant leaching and runoff (Shumar et al., 2007). Because  
16 of these concerns, the U.S. Department of Agriculture and the State of Idaho have partnered to  
17 create the Conservation Reserve Enhancement Program (CREP) to provide incentives to  
18 farmers who volunteer to take cropland and marginal pastureland out of agricultural production  
19 (USDA, 2006).

20  
21 Potential soil contamination resulting from preconstruction, construction, and operation of the  
22 proposed EREF could be avoided or minimized by implementing BMPs and mitigation  
23 measures, such as those that would be described in the proposed facility's SPCC Plan (to be  
24 prepared by AES). Mitigation measures would also be implemented during all project phases to  
25 minimize soil erosion and control fugitive dust (AES, 2010a). In addition, potentially  
26 contaminated runoff from the storage pads would discharge only to lined stormwater retention  
27 basins, and solids carried in process effluents from plant operations would remain within the  
28 Liquid Effluent Treatment System Evaporator (AES, 2010a). For these reasons, NRC staff  
29 concludes that the proposed EREF project's contribution to cumulative impacts on soils would  
30 be SMALL.

31  
32 For construction of the proposed 161-kV transmission line, soil impacts such as increased  
33 potential for erosion and compaction could result from soil-disturbing activities at pulling and  
34 tensioning sites, construction and staging yards, and structure sites, and along the new access  
35 road and substation construction site. Because soil impacts would occur primarily during the  
36 construction phase, they would be short in duration. Disturbance-related impacts could be  
37 avoided or minimized by implementing standard BMPs and mitigation measures, such as those  
38 that would be described in the proposed facility's SPCC Plan. Mitigation measures would also  
39 be implemented during all project phases to minimize soil erosion and control fugitive dust  
40 (AES, 2010a). Limiting heavy equipment and vehicles to designated areas (roads and staging  
41 areas) would minimize the extent of soil compaction. For these reasons, the NRC staff  
42 concludes that the proposed transmission line project's contribution to cumulative impacts on  
43 soils would be SMALL.

#### 44 45 **4.3.6 Water Resources**

46  
47 The ESRP aquifer is the source of water for the proposed EREF. Because it is the principal  
48 source of drinking water for southeastern and south-central Idaho, the ESRP aquifer was

1 designated as a sole source aquifer in 1991 (EPA, 2009e). The IDEQ estimated that the ESRP  
2 aquifer contains as much as 1233 billion cubic meters (1 billion acre-feet) of water (IDEQ,  
3 2005). Use of the regional water supply is regulated by the IDWR through appropriations that  
4 are granted by water rights. Water rights permit their holders to divert public waters for  
5 beneficial uses (IDWR, 2010).  
6

7 The proposed EREF would be expected to use about 837,000 cubic meters (221 million gallons)  
8 of water during its first 12 years (see Table 4-10) and an average of 24,900 cubic meters  
9 (6.6 million gallons) of water annually during years 13 through 30 (AES, 2009a). Based on  
10 these projections, the total water usage would be as high as 1.3 million cubic meters  
11 (340 million gallons or 1043 acre-feet) of ESRP aquifer waters over the 30-year life of the  
12 proposed facility, taking into account industrial usage during preconstruction, construction, and  
13 operations (AES, 2010a). This constitutes a very small portion, less than 1 percent, of the  
14 1233 billion cubic meters (1 billion acre-feet) of the ESRP aquifer reserves in the State of Idaho  
15 (IDEQ, 2006). Therefore, the NRC staff concludes that the proposed EREF project's  
16 contribution to cumulative impacts on the region's groundwater supply would be SMALL.  
17

18 Portions of the ESRP aquifer have been contaminated, mainly as a result of the disposal  
19 operations at the INL site (Shumer et al., 2007; EPA, 2009c). Recent multilevel groundwater  
20 monitoring of INL wells conducted by the USGS INL project office indicates that contamination  
21 in the aquifer varies with depth and that wastewater constituents originating from INL (such as  
22 tritium and various VOCs) tend to sink to greater depths as groundwater moves to the  
23 southwest (downgradient). These data are consistent with models predicting that contaminants  
24 downgradient of the INL boundary are most concentrated in deeper zones of the aquifer, at  
25 depths beyond those of residential wells in southeastern Idaho (Roy Bartholomay as quoted in  
26 Lundquist, 2010). The vertical distribution of contaminants in the ESRP aquifer is attributed to  
27 variability in groundwater movement, which is influenced locally by geologic conditions and  
28 patterns of recharge (e.g., precipitation, wastewater returns, streamflow infiltration, irrigation  
29 infiltration, inflow from adjoining drainage basins, underflow from drainage basins, and  
30 groundwater upwelling) and discharge, including heavy pumpage for irrigation (Bartholomay and  
31 Twining, 2010).  
32

33 Land applications of fertilizer and pesticides and excessive irrigation are the main causes of  
34 contamination in shallow aquifers, and present a future concern for the ESRP aquifer  
35 (Shumer et al., 2007). Potential groundwater contamination resulting from the operation of the  
36 proposed EREF could be avoided or minimized by implementing BMPs and mitigation  
37 measures, such as those that would be described in the proposed facility's SPCC Plan. In  
38 addition, potentially contaminated runoff from the storage pads would discharge only to lined  
39 stormwater retention basins, and no process effluents would be discharged to the stormwater  
40 basins or into surface water (AES, 2010a). For these reasons, the NRC staff concludes that the  
41 proposed EREF project's contribution to cumulative impacts on surface water and groundwater  
42 quality would be SMALL.  
43

44 Impacts to water resources from construction of the proposed 161-kV transmission line would  
45 occur in areas where soil-disturbing activities would change natural drainage patterns or  
46 increase surface runoff (and sedimentation potential) offsite. (Poles are not likely to be installed  
47 deep enough to create conduits to groundwater.) Accidental releases of hazardous materials  
48 and wastes (such as those used in voltage transformers) could impact the quality of surface

1 water or groundwater. Because soil-disturbing activities would occur primarily during the  
2 construction phase, they would be short in duration. Water quality-related impacts could be  
3 avoided or minimized by implementing standard BMPs and mitigation measures, such as those  
4 that would be described in the proposed facility's SPCC Plan. Mitigation measures also would  
5 be implemented during all project phases to minimize surface runoff and soil erosion and the  
6 potential for inadvertent spills or releases (AES, 2010a). For these reasons, the proposed  
7 transmission line's contribution to cumulative impacts on water resources would be SMALL.  
8

#### 9 **4.3.7 Ecology**

10  
11 Past and ongoing impacts to sagebrush steppe, the predominant community type in the Eastern  
12 Snake River Basalt Plains ecoregion, and wildlife have resulted primarily from habitat losses,  
13 such as from agriculture, fragmentation, and decreases in habitat quality due to livestock  
14 grazing (Connelly et al., 2004; BLM/DOE, 2004; ISAC, 2006). Invasive species and changes in  
15 fire regimes have also impacted sagebrush steppe in the region. Large areas of sagebrush  
16 habitat have been replaced by non-native grasses, through range improvement efforts or by  
17 wildfires. All of these factors, as well as roadway construction, have contributed to  
18 fragmentation of sagebrush habitat within the ecoregion. Increasing fragmentation decreases  
19 the patch size of undisturbed habitat, increases edge area, and decreases habitat connectivity  
20 (NorthWestern Energy, 2008). Species that require large contiguous habitat areas may decline.  
21 Some sagebrush obligate bird species, for example, can show declines within 100 meters  
22 (328 feet) of roadways, and mule deer and elk are affected by the proximity of roads  
23 (NorthWestern Energy, 2008).  
24

25 These land uses and associated impacts are expected to continue into the foreseeable future.  
26 Additional future losses of habitat may result from additional conversion to cropland or  
27 development. Impacts to habitat and wildlife in the region could result from the construction of  
28 the Mountain States Transmission Intertie. An alternative route of that transmission line would  
29 be located adjacent to the proposed EREF property (MDEQ, 2010). The proposed action would  
30 contribute a loss of approximately 75 hectares (185 acres) to the cumulative impacts on  
31 sagebrush steppe habitat (AES, 2010a). This area represents approximately 0.7 percent of the  
32 sagebrush steppe within 8 kilometers (5 miles) and 0.2 percent within 16 kilometers (10 miles),  
33 and would result in a minor contribution to losses of sagebrush habitat within the area and  
34 ecoregion. The contribution to habitat fragmentation would be small due to the location of the  
35 proposed facility adjacent to previously disturbed nonirrigated pasture and cropland. Greater  
36 sage-grouse (*Centrocercus urophasianus*), a sagebrush obligate species and a candidate for  
37 Federal listing, have experienced severe long-term population declines in Idaho and throughout  
38 their range. These declines have been due in large part to the loss, degradation, and  
39 fragmentation of sagebrush habitat (Connelly et al., 2004; BLM/DOE, 2004;  
40 ISAC, 2006). Throughout the region, sagebrush communities have been converted to farmland  
41 and grasslands and have been lost or severely degraded by wildfires (Connelly et al., 2004;  
42 BLM/DOE, 2004; ISAC, 2006). As noted in Section 3.8, approximately 98 percent of the BLM  
43 Upper Snake Field Office Planning Area, which includes the proposed EREF property, is  
44 sagebrush steppe. Approximately 20,725 hectares (51,213 acres) of cultivated cropland and  
45 3892 hectares (9617 acres) of recently burned grassland and introduced annual grasses occur  
46 within 16 kilometers (10 miles) of the proposed EREF (Landscape Dynamics Lab, 2009). Based  
47 on surrounding areas, these, along with other disturbed areas, likely represent losses of what  
48 had been mostly sage-grouse habitat. As discussed in Section 4.2.7, the proposed action



1 would result in a minor contribution to losses and fragmentation of sagebrush habitat within the  
2 area and ecoregion. Sage-grouse would also likely avoid areas near the proposed facility  
3 during construction and operations, creating a somewhat larger area of effective loss of habitat.  
4 This loss would be a small incremental addition to the cumulative impacts on sage-grouse  
5 habitat within the 16-kilometer (10-mile) area and within the ecoregion, and would continue  
6 throughout the license period and potentially beyond, depending on post-decommissioning use  
7 of the site. Therefore, the contribution to cumulative impacts from the proposed EREF project  
8 on sage-grouse and other ecological resources would be SMALL.

9  
10 For construction of the proposed 161-kV transmission line, vegetation would be cut where  
11 necessary for equipment operation at work areas for pole locations and pulling and tensioning  
12 sites. Pole location work areas would be 1444 square meters (15,625 square feet) in area;  
13 pulling and tensioning site work areas would be 7442 square meters (80,000 square feet) or  
14 5978 square meters (64,000 square feet) in area (AES, 2010a). At some pulling and tensioning  
15 sites, ground disturbance could occur within a 150-meter (500-foot) radius (AES, 2010a).  
16 Disturbed soil in work areas would be graded to blend with natural contours and reseeded as  
17 necessary (AES, 2010a). One new access road, a 2-track dirt road, would be constructed on  
18 the east side of the proposed EREF site. Larger shrubs within the ROW or access roads would  
19 be cut to allow equipment access, while shorter shrubs would be driven over.

20  
21 Vegetation types within a 91-meter (300-foot) wide corridor surveyed for the proposed  
22 transmission line route are similar to those of the proposed EREF site and include 48 hectares  
23 (118 acres) of sagebrush steppe, 155 hectares (382 acres) of irrigated cropland, and small  
24 areas of nonirrigated pasture planted with crested wheatgrass (AES, 2010a). Approximately  
25 3.2 hectares (7.9 acres) of sagebrush steppe habitat would be permanently removed for access  
26 road and structure locations. Most of the sagebrush steppe within the corridor occurs within the  
27 existing ROW between the Bonneville and Kettle Substations. This habitat has been previously  
28 fragmented by the existing 69-kV transmission line and access roads. Expansion of the  
29 Bonneville Substation would primarily affect cropland. The location of the new Twin Buttes  
30 Substation on the proposed EREF site would be cleared and graded during EREF  
31 preconstruction. The loss of 3.2 hectares (7.9 acres) of sagebrush steppe habitat would  
32 contribute incrementally to the loss of this habitat type in the region, including the loss of  
33 75 hectares (185 acres) associated with construction of the proposed EREF, and would result in  
34 a small contribution to cumulative impacts on this habitat type.

35  
36 Indirect effects on sagebrush steppe habitat of transmission line construction and operation  
37 could also include erosion, sedimentation, spread of invasive species, reduction in habitat  
38 quality, and habitat fragmentation. Populations of sagebrush steppe species that are cut or  
39 crushed by heavy equipment in work areas, such as at pulling and tensioning sites, may require  
40 considerable periods of time to return to pre-disturbance levels, and some species may not  
41 recover. Some mortality of big sagebrush or other species would likely occur. In addition,  
42 non-native species occurring in the area or introduced to the sites could become established or  
43 expand into areas disturbed by construction activities. The habitat quality of these areas may  
44 subsequently be reduced. Invasive species, such as cheatgrass, can greatly change the fire  
45 regime, increasing the frequency and intensity of fires, adversely affecting native habitats such  
46 as sagebrush steppe. Transmission line ROWs can promote the spread of invasive species  
47 (BPA, 2000). Erosion of disturbed soils or from cut-over areas may contribute to reduction in  
48 sagebrush steppe habitat or habitat quality. Sedimentation from disturbed soils may degrade

1 habitat along drainages or in wetlands that occur downstream. Erosion and sedimentation  
2 impacts would be reduced, however, by planned mitigation measures. Although habitat  
3 fragmentation can occur as a result of transmission line construction, the sagebrush steppe  
4 along the proposed transmission line route would be predominantly included within an existing  
5 ROW or would be located adjacent to the proposed EREF. Small portions of the proposed  
6 transmission line route east of the proposed EREF would be located in undisturbed areas and  
7 would contribute to the fragmentation of sagebrush steppe habitat. These indirect impacts  
8 would result in a small contribution to cumulative impacts on native habitats within the region.  
9

10 Impacts of transmission line construction and operation could also include wildlife disturbance  
11 and wildlife mortality. The proposed transmission line route includes potentially suitable habitat  
12 for sagebrush obligate species, including migratory bird species, although much of this habitat  
13 has been affected by the existing transmission line and access roads. These species could be  
14 affected by the permanent loss of 3.2 hectares (7.9 acres) of sagebrush steppe habitat and the  
15 temporary loss of habitat in work areas and reduction in habitat quality of disturbed areas of  
16 sagebrush steppe in work areas. No sage-grouse leks have been found in the immediate  
17 vicinity of the new transmission line route (North Wind, 2010).  
18

19 Wildlife would also be disturbed by noise and human presence during the construction of the  
20 proposed transmission line and expansion of the Bonneville Substation. Migratory birds nesting  
21 in the vicinity of the transmission line construction could be affected if nest abandonment  
22 occurs. The new transmission line would be approximately 150 meters (490 feet) closer to the  
23 nearest sage-grouse lek, compared to the proposed EREF. As with EREF construction,  
24 however, noise levels associated with transmission line construction would not be expected to  
25 affect sage-grouse at the lek. These indirect impacts would result in a small contribution to  
26 cumulative impacts on wildlife populations within the region.  
27

28 The construction of a new transmission line could contribute to avian mortality as a result of bird  
29 collisions with the power lines, and could affect migratory bird species. Sage-grouse and sharp-  
30 tailed grouse, which are known to occur in the area, could be impacted due to the proximity of  
31 US 20 and movements between habitat north and south of the highway and proposed  
32 transmission line, or when migrating between seasonal use areas. While bald eagles, which  
33 nest along the Snake River, could potentially be affected by collisions with the transmission  
34 lines, such impacts are unlikely because of the distance from nesting and foraging areas. In  
35 addition, raptors, such as hawks and eagles, may perch on transmission line support structures,  
36 potentially resulting in mortality from electrocution. Ferruginous hawks, which nest in the region,  
37 could be also affected by the new transmission lines. However, RMP would implement design  
38 measures for the protection of raptors and other bird species, reducing potential impacts  
39 (AES, 2010a). Most of the proposed transmission line would be included within the existing  
40 69-kV transmission line ROW, with about 7.6 kilometers (4.75 miles) of new ROW between the  
41 Kettle Substation and the proposed Twin Buttes Substation. The number of birds affected by the  
42 new line within the existing ROW could be greater than those currently affected. Relatively few  
43 birds would be expected to be affected by the new line within the proposed 161-kV transmission  
44 line ROW, much of which would be located within or adjacent to the proposed EREF site. The  
45 contribution of the proposed new transmission line to cumulative impacts on bird populations in  
46 the ecoregion would be SMALL.  
47

1 Because support structures can provide perch sites for raptors and corvids (ravens and crows),  
2 construction of the proposed transmission line may increase predation by raptors and corvids in  
3 the area. Populations of prey species, such as sage-grouse or pygmy rabbits, which may occur  
4 in the area, could be impacted by increased predation.  
5

#### 6 **4.3.8 Noise**

7  
8 With the exception of the construction of the proposed transmission line connecting the  
9 proposed EREF with the transmission grid operated by RMP, no major industrial facilities are  
10 expected to be constructed in the vicinity of the proposed EREF property. Noise impacts will  
11 occur from the construction of the proposed transmission line, but those impacts would be  
12 sporadic and SMALL. The noise impacts on the proposed EREF property associated with the  
13 continuing activities at INL would be SMALL. Cumulative impacts to noise from preconstruction,  
14 construction, and operation of the proposed EREF, from the construction and operation of the  
15 proposed transmission line that would serve the proposed EREF, and from activities at INL  
16 would be SMALL.  
17

#### 18 **4.3.9 Transportation**

19  
20 The impacts of construction (including preconstruction activities) and operation of the proposed  
21 EREF due to increased traffic from commuting construction workers would be SMALL to  
22 MODERATE, although no highway upgrades would be required other than safety  
23 enhancements on US 20 such as the construction of turning/acceleration/deceleration or a  
24 grade-separated interchange for entry to and exit from the proposed EREF. As noted in the  
25 introduction to Section 4.3, there are no planned or proposed/future actions the vicinity of the  
26 proposed EREF that would contribute to cumulative transportation impacts (i.e., affect traffic  
27 levels. Current activities that would contribute to cumulative transportation impacts include the  
28 shipment of radioactive materials from INL to Idaho Falls along US 20 (approximately  
29 25–40 shipments per month) (INL, 2010). Because the INL shipments comprise less than  
30 2 percent of current traffic flow on US 20 in the vicinity of the proposed EREF and the  
31 population density along this route is low, the cumulative effects on transportation would be  
32 SMALL.  
33

34 Construction and maintenance of the proposed 161-kV transmission line and the substation  
35 work would require access to the ROW from US 20. Traffic volume could increase along US 20,  
36 and slowing or accelerating construction and maintenance vehicles could result in intermittent  
37 disruption of high-speed traffic flow (see Section 3.10.1). However, only two access points from  
38 US 20 are anticipated (both of which currently exist near the proposed EREF site); the  
39 remaining access points are from an adjacent county road. Less than 10 vehicles would be  
40 used at any one time during construction of the proposed transmission line and new substation  
41 (AES, 2010a), and large construction equipment would not likely travel to and from work sites  
42 on a daily basis during construction period. The additional number of daily vehicle-trips  
43 resulting from these activities would represent less than 2 percent of the anticipated peak  
44 increase in daily traffic to and from the proposed EREF site during preconstruction and  
45 construction (see Section 4.2.9.1). In addition, this impact would occur during the construction  
46 phase of the proposed EREF and would be short in duration. The NRC staff concludes that  
47 transportation impacts associated with transmission line construction and operation would be  
48 SMALL.

1 **4.3.10 Public and Occupational Health**  
2

3 Public and occupational health impacts that might contribute to cumulative impacts would be  
4 associated with the construction and operation of the proposed 161-kV transmission line that  
5 would serve the proposed EREF. It is estimated that 30 workers would complete the  
6 construction of the proposed transmission line within one year (AES, 2010a). This level of effort  
7 represents less than 1 percent of the total FTE-years estimated to construct the proposed  
8 facility (see Table 4-14). Maintenance of the line and ROW during its operational life would add  
9 minimally to already small occupational injury rates for operating the proposed EREF  
10 (see Table 4-15). Since the public and occupational impacts of facility construction and  
11 operation would be SMALL, the small incremental addition of the transmission line construction  
12 and operation would only negligibly contribute to cumulative impacts.  
13

14 With regard to cumulative impacts from fluoride emissions during facility operation, there are  
15 currently very low levels of exposure to the public from industrial chemical emissions in the  
16 region surrounding the proposed facility in general and no other known or anticipated sources of  
17 fluoride emissions. Thus cumulative effects on the public of the minor HF emissions expected  
18 from the proposed facility in combination with other chemical emissions in the region would be  
19 SMALL.  
20

21 The annual collective population dose from operations was estimated to be approximately  
22  $1.7 \times 10^{-5}$  person-sievert ( $1.7 \times 10^{-3}$  person-rem) in Section 4.2.10.2. Such a dose is so low that  
23 it cannot be monitored, as is the case for the annual collective population dose from operations  
24 at the nearby INL, as discussed in Section 3.11.1. Exposure of individuals that may be near the  
25 proposed EREF property boundary would also be low. Thus, cumulative impacts to the public  
26 from radiological sources at the proposed EREF and other nearby sources would be SMALL.  
27

28 **4.3.11 Waste Management**  
29

30 As shown in Section 4.2.11, the impact of disposal of hazardous, nonhazardous solid, and solid  
31 low-level radioactive wastes from the proposed EREF at the appropriate facilities would be  
32 SMALL given past and present conditions. Based on available capacities at low-level  
33 radioactive and hazardous waste treatment and disposal sites, in conjunction with the  
34 expectation that there will be no large developments in the Idaho Falls area that would cause a  
35 significant increase in municipal waste disposal volume, the cumulative impacts from hazardous  
36 and solid waste generation would be SMALL.  
37

38 Nonhazardous and sanitary wastes would be generated during construction and maintenance of  
39 the proposed 161-kV transmission line and the new and upgraded substations. Nonhazardous  
40 construction wastes (including debris from the dismantled 69-kV transmission line) would be  
41 recycled or transported to an approved landfill such as the Bonneville County Hatch Pit  
42 (see Section 4.2.11.1). Sanitary waste would be collected locally in portable systems. The  
43 generation of hazardous waste is not anticipated, but hazardous materials that are typical of a  
44 high-voltage application (including oil in transformers, sulfuric acid in batteries, diesel fuel in  
45 generators, and sulfur hexafluoride gas in circuit breakers) would be used and could require  
46 disposal at an approved disposal facility (AES, 2010a). Because the number and volume of  
47 waste shipments from construction of the proposed transmission line and new substation would  
48 represent less than 1 percent of those from preconstruction and construction of the proposed

1 EREF, the NRC staff concludes that the cumulative waste management impacts of transmission  
2 line construction and operation would be SMALL.

#### 3 4 **4.3.12 Socioeconomics**

5  
6 A number of other development projects have been proposed for the two-county ROI that could  
7 produce cumulative socioeconomic impacts in association with the proposed EREF, depending  
8 upon project scope and development schedules of the additional projects. (Note: These  
9 projects are all located within the 80.5-kilometer [50-mile] radius ROI for socioeconomics, but,  
10 with the exception of the proposed EREF transmission line, outside the 16-kilometer [10-mile]  
11 ROI for all other environmental resources.) The construction of the proposed 13.75-mile,  
12 161-kv transmission line to support the proposed EREF would produce 57 jobs and produce  
13 \$2.8 million in income, \$0.1 million in direct sales taxes, and \$0.1 million in direct income taxes  
14 in the region including Bingham and Bonneville Counties (AES, 2010a). Jobs, income, and tax  
15 revenues produced during transmission line operations would be small. In Bonneville County,  
16 additional developments could include the Snake River Landing planned community, the Taylor  
17 Crossing planned community, The Narrows mixed-use office/residential development, the  
18 Central Valley development, the McNeil Development that includes a Marriott Hotel and  
19 condominiums, the Sleep Inn Hotel, and the West Broadway soccer complex presently under  
20 construction (AES, 2009a). In Bingham County, planned developments would include the  
21 construction of a 150-unit wind power development (AES, 2009a).

22  
23 These projects would provide additional employment opportunities for construction workers and  
24 would increase the economic activity in the region. Depending upon the timing of construction  
25 and operation of each of these projects, however, there could be a number of negative impacts.  
26 Although competition for the hiring of construction and operations workers may lead to wage  
27 inflation in the area, the size of the regional labor force is likely large enough to prevent this  
28 being a major issue. The development of additional projects would also lead to long-term  
29 employment opportunities and might result in in-migration into the area. Depending on the  
30 timing of construction for these projects and the type and quantity of construction materials  
31 needed, there could be supply shortages of some materials, leading to price increases.  
32 However, the magnitude of these impacts would likely be SMALL. Given all these  
33 considerations, the cumulative socioeconomic impacts of the proposed EREF project would be  
34 SMALL.

#### 35 36 **4.3.13 Environmental Justice**

37  
38 Minority and low-income populations occur within a 4-mile radius of the proposed EREF site  
39 (see Section 3.13) and within a two-mile buffer either side of the proposed 13.75-mile  
40 transmission line ROW that would be constructed to support the proposed EREF (Table 4-38).  
41 However, none of the Census block groups associated with the proposed EREF or the  
42 proposed transmission line route have minority or low-income populations that exceed county or  
43 State averages by more than 20 percentage points, or exceed 50 percent of total block group  
44 population. Preconstruction, construction, and operation of the proposed EREF and  
45 construction and operation of the associated transmission line would not produce high and  
46 adverse impacts to the general population, and so would not disproportionately impact minority  
47 and low-income populations. Accordingly, the cumulative impacts on minority and low-income  
48 populations would be SMALL.



**Table 4-38 Minority and Low-Income Populations within the 2-mi (3.2-km) Buffer Associated with the Proposed Transmission Line**

Parameter	
Total population	1777
White, non-Hispanic	1470
Hispanic or Latino	266
Non-Hispanic or Latino minorities	41
One race	22
Black or African American	6
American Indian or Alaskan Native	2
Asian	13
Native Hawaiian or other Pacific Islander	1
Some other race	0
Two or more races	19
Total minority	307
Low-income	178
Percent minority	17.3
County percent minority	10.5
State percent minority	9.0
Percent low-income	10.2
County percent low-income	10.1
State percent low-income	11.8

Source: U.S. Census Bureau (2010).

2  
3 Although minority and low-income populations occur in the vicinity of the proposed EREF site  
4 (see Section 3.13), construction and operation of the proposed EREF would not affect such  
5 populations. Accordingly, the cumulative impacts on environmental justice populations would  
6 be SMALL.

7  
8 **4.4 Impacts of the No-Action Alternative**

9  
10 As presented in Section 2.2 of this EIS, the no-action alternative would be to not construct,  
11 operate, and decommission the proposed EREF in Bonneville County, Idaho. As discussed in  
12 the introduction to Section 4.2, the NRC has granted an exemption for AES to conduct certain  
13 preconstruction activities in advance of a formal licensing decision. If the NRC does not grant a  
14 construction and operating license for the proposed EREF, some or all of the preconstruction  
15 activities granted under the exemption approval (NRC, 2010a) are expected to have already

1 occurred. It follows that the impacts associated with these preconstruction activities, as  
2 described in Section 4.2, will also have occurred. There may be additional activities occurring at  
3 the proposed site in the future under the no-action alternative that may have adverse or  
4 beneficial impacts on the environment. The impacts associated with these activities would  
5 depend on what AES would decide to do with the proposed site or any improvements  
6 (e.g., access roads) already constructed on the site. The impact conclusions presented in this  
7 section for the no-action alternative address the impacts of denying the license, but do not  
8 include the impacts of the NRC-approved preconstruction activities, some or all of which are  
9 expected to have already occurred.

10  
11 Under the no-action alternative, nuclear electricity generation customers would continue to  
12 depend on existing suppliers (i.e., existing uranium enrichment facilities, foreign sources, and  
13 the Megatons to Megawatts Program) to fulfill uranium enrichment needs. In addition, three  
14 future domestic sources of enriched uranium are planned – two of which are currently under  
15 construction (American Centrifuge Plant [ACP] and NEF) and the third is planned and seeking a  
16 license from the NRC (GLE Facility). Current U.S. demand for low-enriched uranium is about  
17 12 to 14 million SWU annually (EIA, 2009). USEC is currently the only domestic supplier of  
18 enrichment services, providing enriched uranium to both domestic and foreign users. Existing  
19 USEC enrichment activities include operation of the Paducah Gaseous Diffusion Plant (GDP),  
20 the downblending of highly enriched uranium under the Megatons to Megawatts Program that is  
21 managed by USEC and scheduled to expire in 2013, and the import of foreign-enriched product.  
22 By combining its domestic enrichment facilities and the downblending of foreign highly enriched  
23 uranium, USEC can provide for approximately 56 percent of the U.S. enrichment market needs  
24 (USEC, 2004) while foreign suppliers provide the remaining 44 percent.

25  
26 Under the no-action alternative, the Paducah GDP, including the Megaton to Megawatts  
27 Program, would serve as the only domestic source of low-enriched uranium. Reliance on one  
28 domestic source for enrichment services could result in disruptions to the supply of low-enriched  
29 uranium, and consequently to reliable operation of U.S. nuclear energy production, should there  
30 be any disruptions to foreign supplies and/or the operations of domestic suppliers (i.e., if the  
31 ACP, NEF, or GLE Facility would not be constructed and operated and the Megatons to  
32 Megawatts Program would not be extended beyond 2013).

33  
34 If the license application for the proposed EREF is not granted, nuclear electricity generation  
35 using enriched uranium from the proposed EREF could be replaced with other power generation  
36 sources (e.g., fossil-fuel plants), which would present a range of impacts that are outside the  
37 scope of this EIS. Alternatively, enriched uranium could be provided by sources constructed at  
38 other locations. Therefore, impacts similar to those quantified in this EIS would simply occur at  
39 a different location. Should another domestic enrichment facility be constructed at an alternate  
40 location, environmental impacts would occur and could range from SMALL to LARGE. These  
41 impacts could be similar to those of the proposed action, but would depend on various factors,  
42 e.g., the type of facility and the affected environment at the alternate location.

43  
44 The site-specific impacts of the no-action alternative for each resource area are discussed in the  
45 following sections.

1 **4.4.1 Land Use**  
2

3 Under the no-action alternative, AES would purchase the property and restrictions on grazing  
4 and agriculture would occur. The zoning designation for the property would remain G-1 Grazing  
5 whether or not the proposed EREF is constructed. Current land uses of grazing and farming  
6 could potentially resume. Impacts to local land use would be SMALL.  
7

8 **4.4.2 Historic and Cultural Resources**  
9

10 Under the no-action alternative, the proposed EREF would not be constructed. No visual  
11 effects or noise would affect the Wasden Complex. Nevertheless, it is assumed that AES would  
12 purchase the property and undertake preconstruction activities that would destroy site MW004.  
13 However, site MW004 would not be affected by the Federal (NRC) licensing action and the  
14 NHPA would not apply. However, the removal of site MW004, which has already occurred,  
15 resulted in a LARGE impact because the site no longer exists; but because AES removed this  
16 site through professional excavation and data recovery and there are other homestead sites of  
17 this type found in the region, the impact has been mitigated to a MODERATE level (WCRM,  
18 2010; Idaho SHPO, 2010b; Gilbert, 2010). The impact on historic and cultural resources would  
19 be SMALL to MODERATE under the no-action alternative.  
20

21 **4.4.3 Visual and Scenic Resources**  
22

23 Under the no-action alternative, impacts to visual and scenic resources would be SMALL. The  
24 proposed EREF would not be constructed. AES would purchase the property and clear the  
25 vegetation; however, these activities are not expected to alter the viewshed. No major visual  
26 intrusions to the existing landscape would occur because no large industrial structures would be  
27 constructed. The existing natural character of the area would largely remain intact. The lack of  
28 development would be consistent with the BLM VRM Class 1 designation for the Hell's Half  
29 Acre WSA. No visual intrusions to the Wasden Complex viewshed would occur.  
30

31 **4.4.4 Air Quality**  
32

33 Under the no-action alternative, the air quality impacts associated with the construction,  
34 operation, and decommissioning of the proposed EREF would not occur. The proposed site  
35 could revert to agricultural activities, which would impact ambient air quality through the release  
36 of criteria pollutants from the operation of agricultural vehicles and equipment and the release of  
37 fugitive dust from the tilling of soils. Those impacts are expected to be substantially less than  
38 impacts resulting from preconstruction and the proposed action. The NRC staff concludes that  
39 local air impacts associated with the no-action alternative would be SMALL.  
40

41 **4.4.5 Geology and Soils**  
42

43 Under the no-action alternative, no additional land disturbance from construction would occur  
44 and the land on the proposed EREF site could revert to crop and grazing activities. Wind and  
45 water erosion would continue to be the most significant natural processes affecting the geology  
46 and soils at the proposed site. Impacts to geology and soils would therefore be expected to be  
47 SMALL.  
48  
49

1 **4.4.6 Water Resources**

2  
3 Under the no-action alternative, additional water use may or may not occur, depending on future  
4 plans for the property. Water resources would be unchanged. Water usage could continue at  
5 the current rate, should agricultural activities resume at the proposed site, and impacts on the  
6 ESRP aquifer and downgradient water users would be SMALL. No changes to surface water  
7 quality would be expected, and the natural (intermittent) surface flow of stormwater on the  
8 proposed site would continue. No additional groundwater use or adverse changes to  
9 groundwater quality would be expected. Impacts therefore would be SMALL.

10  
11 **4.4.7 Ecological Resources**

12  
13 Most impacts on ecological resources would occur during the preconstruction phase. However,  
14 such impacts would also occur under the proposed action. The potential impacts associated  
15 with the construction, operation, and decommissioning of the proposed EREF would not occur.  
16 The land on the proposed EREF site could revert to crop and grazing activities. Denying the  
17 license would not result in additional land disturbance on the proposed EREF property.  
18 Revegetation of the site could occur with renewal of some wildlife habitat. Anticipated impacts  
19 on ecological resources from the no-action alternative would be SMALL.

20  
21 **4.4.8 Noise**

22  
23 Under the no-action alternative, none of the noise impacts associated with construction,  
24 operation, and decommissioning at the proposed EREF would occur. Land uses on the  
25 proposed EREF site could revert to previous applications, livestock grazing and/or crop  
26 production, with concomitant noise impacts. Impacts would be SMALL.

27  
28 **4.4.9 Transportation**

29  
30 Under the no-action alternative, traffic volumes and patterns would remain the same as  
31 described in the affected environment section. The current volume of radioactive material and  
32 chemical shipments to/from facilities other than the proposed EREF would not increase.  
33 Transportation impacts would be SMALL.

34  
35 **4.4.10 Public and Occupational Health**

36  
37 Under the no-action alternative, public and occupational health impacts would be SMALL.  
38 Occupational health impacts from construction, operation, and decommissioning would not  
39 occur. Associated worker and public impacts from chemical and radioactive hazards would also  
40 not occur. Should the land be returned to grazing and agriculture, the impacts would be  
41 SMALL.

42  
43 **4.4.11 Waste Management**

44  
45 Under the no-action alternative, since construction, operation, and decommissioning of the  
46 proposed EREF would not occur, new wastes including sanitary, hazardous, low-level  
47 radioactive, or mixed wastes would not be generated that would require disposition. Impacts  
48 from waste management would be SMALL.

1 **4.4.12 Socioeconomics**

2  
3 Under the no-action alternative, any positive or adverse consequences of the construction,  
4 operation, and decommissioning of the proposed EREF would not occur and socioeconomic  
5 conditions in the ROI would remain unchanged. As a result, the impact of no action on social  
6 and economic conditions in the region would be SMALL.

7  
8 Population in the area surrounding the proposed EREF, Bingham and Bonneville Counties, is  
9 expected to grow in accordance with current projections, with total population in the region  
10 projected to be approximately 156,491 in 2013 and 168,331 in 2017 (AES, 2010a). In addition  
11 to population growth, the social characteristics of the region, including housing availability,  
12 school enrollment, availability of health service resources, and law enforcement and firefighting  
13 resources, are expected to change over time. However, future changes in these characteristics  
14 are difficult to quantify, and no projections of their future growth are available.

15  
16 **4.4.13 Environmental Justice**

17  
18 The no-action alternative would not be expected to cause any high and adverse impacts; it  
19 should not raise any environmental justice issues. Therefore, any impacts would be SMALL.

20  
21 **4.4.14 Accidents**

22  
23 There would be no facility accidents during operation if the proposed EREF is not constructed.  
24 Therefore, impacts would be SMALL.

25  
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1  
2  
3 **5 MITIGATION**

4 This chapter identifies possible measures to mitigate potential environmental impacts from  
5 preconstruction and the proposed action, as required by Appendix A of Title 10, "Energy,"  
6 Part 51, of the U.S. *Code of Federal Regulations* (CFR) (10 CFR Part 51). Under Council on  
7 Environmental Quality (CEQ) regulation 40 CFR 1500.2(f), Federal agencies shall, to the fullest  
8 extent possible, "use all practicable means consistent with the requirements of the *National*  
9 *Environmental Policy Act* and other essential considerations of national policy to restore and  
10 enhance the quality of the human environment and avoid or minimize any possible adverse  
11 effects of their actions on the quality of the human environment." The CEQ regulations define  
12 mitigation to include activities that (1) avoid the impact altogether by not taking a certain action  
13 or parts of an action; (2) minimize impacts by limiting the degree or magnitude of the action and  
14 its implementation; (3) repair, rehabilitate, or restore the affected environment; (4) reduce or  
15 eliminate impacts over time by preservation or maintenance operations during the life of the  
16 action; or (5) compensate for the impact by replacing or substituting resources or environments  
17 (40 CFR 1508.20). This definition has been used in identifying potential mitigation measures.  
18 As such, mitigation measures are those actions or processes (e.g., process controls and  
19 management plans) that would be implemented to control and minimize potential impacts  
20 associated with the proposed Eagle Rock Enrichment Facility (EREF).

21 AREVA Enrichment Services, LLC (AES) must comply with applicable laws and regulations,  
22 including obtaining all appropriate construction and operating permits. A complete discussion of  
23 applicable laws and regulations is included in Chapter 1 of this Environmental Impact Statement  
24 (EIS). The mitigation measures identified by AES (AES, 2010a), many of which are compliance  
25 related, are discussed in Section 5.1. Further, based on the potential impacts identified in  
26 Chapter 4 (Environmental Impacts) of this EIS, the U.S. Nuclear Regulatory Commission (NRC)  
27 staff has identified additional potential mitigation measures for impacts of the proposed EREF  
28 project. These measures are described in Section 5.2.

29  
30 The mitigation measures identified in this chapter do not include environmental monitoring  
31 activities. Environmental monitoring activities are described in Chapter 6 of this EIS.

32  
33 **5.1 Mitigation Measures Identified by AES**

34  
35 Tables 5-1 and 5-2 summarize those mitigation measures that were identified in AES's  
36 Environmental Report (ER) for the proposed EREF (AES, 2010a) as applicable to the  
37 preconstruction/construction and operations phases, respectively. The information in  
38 Tables 5-1 and 5-2 is taken largely from the ER. These mitigation measures were identified by  
39 AES to reduce the potential environmental impacts of preconstruction and the proposed action.  
40 AES did not identify mitigation measures for socioeconomic or environmental justice for either  
41 construction or operations because the socioeconomic impacts of the proposed project are  
42 mostly positive and the proposed project will result in no disproportionately high impacts on low-  
43 income and minority populations (see Sections 4.2.12 and 4.2.13). Additional mitigation  
44 measures may be considered by AES as a result of AES's consultations and/or permitting  
45 activities with Federal, State, and local regulatory agencies other than the NRC.  
46



**Table 5-1 Summary of Mitigation Measures Identified by AES for Preconstruction and Construction Environmental Impacts**

Impact Area	Activity	Mitigation Measures
Land Use	Land disturbance	<p>Use the following best management practices (BMPs) to mitigate short-term increases in soil erosion and fugitive dust (additional discussion is provided below under Geology and Soils):</p> <ul style="list-style-type: none"> <li>• minimize the construction footprint to the extent practicable</li> <li>• limit site slopes to a horizontal-vertical ratio of four to one, or less</li> <li>• use a sedimentation detention basin</li> <li>• protect undisturbed areas with silt fencing and straw bales, as appropriate</li> <li>• use site stabilization practices such as placing crushed stone on disturbed soil in areas of concentrated runoff</li> <li>• water onsite construction roads at least twice daily, when needed, to control fugitive dust emissions</li> <li>• after construction is complete, stabilize the site with natural low-water consumption, low-maintenance landscaping, and pavement</li> </ul>
Historic and Cultural Resources	Disturbance of prehistoric archaeological sites and sites eligible for listing on the <i>National Register of Historic Places</i>	<p>Educate workers on the regulations governing cultural resources, stressing that unauthorized collecting is prohibited.</p> <p>Use onsite cultural resource monitors during construction activities.</p> <p>Implement procedures to address unexpected discoveries of human remains or previously unidentified archaeological materials during ground-disturbing activities and procedures for the evaluation and treatment of these resources.</p> <p>Cease construction activities in the area around any discovery of human remains or other item of archaeological significance and notify the State Historic Preservation Officer to make the determination of appropriate measures to identify, evaluate, and treat the discoveries.</p> <p>Treatment/mitigation plan for site MW004 (recommended eligible for inclusion in the <i>National Register of Historic Places</i>) to recover significant information on that site (professional excavation and data recovery have been conducted).</p>

**Table 5-1 Summary of Mitigation Measures Identified by AES for Preconstruction and Construction Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Visual and Scenic Resources	Potential visual intrusions in the existing landscape character	<p>Use accepted natural, low-water-consumption landscaping techniques to limit any potential visual impacts. Such techniques will incorporate, but not be limited to, the use of native landscape plantings and crushed stone pavements on difficult-to-reclaim areas.</p> <p>Use prompt revegetation or covering of bare areas with natural materials.</p> <p>Paint the proposed facility in colors that would blend with the surrounding vegetation to reduce the contrast between the proposed EREF plant and the surrounding landscape.</p> <p>Create earthen berms or other types of visual screens made of other natural material to help reduce the visibility of the proposed facility.</p> <p>Focus all perimeter lights to be downfacing to minimize light pollution.</p>
Air Quality	Fugitive dust and point-source releases of criteria pollutants	<p>Apply construction BMPs to minimize fugitive dust, including:</p> <ul style="list-style-type: none"> <li>• apply water twice daily (when needed) to unpaved onsite roads, excavation areas, and clearing and grading areas</li> <li>• use alternative dust palliatives (inorganic salts, asphaltic products, synthetic organics)</li> <li>• establish and enforce speed limits for onsite roads</li> <li>• suspend certain dust-producing activities during windy conditions</li> <li>• apply gravel to the unpaved surfaces of onsite haul roads as an interim measure before permanent pavements are installed</li> <li>• apply erosion mitigation methods in areas of disturbed soils</li> <li>• use water sprays at material drop and conveyor transfer points</li> <li>• limit the height and disturbance of material stockpiles</li> <li>• apply water to the surfaces of stockpiles</li> <li>• cover open-bodied trucks that transport materials that could be sources of airborne dust</li> </ul>

**Table 5-1 Summary of Mitigation Measures Identified by AES for Preconstruction and Construction Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Air Quality (Cont.)		<ul style="list-style-type: none"> <li>• promptly remove earthen materials deposited on paved roadways by wind, trucks, or earthmoving equipment</li> <li>• promptly stabilize or cover bare areas resulting from roadway or highway interchange construction</li> </ul> <p>Apply BMPs to the design and operation of onsite vehicle and equipment fueling activities to minimize the release to the atmosphere of nonmethane hydrocarbons and mitigate the potential impact of spills or accidental releases; including:</p> <ul style="list-style-type: none"> <li>• equip storage tanks with appropriate VOC controls, liquid level gauges, and overfill protection</li> <li>• provide training to fuel delivery drivers</li> <li>• post appropriate warning signs at the fuel dispensing facility</li> <li>• pave fuel unloading and dispensing areas and equip them with curbs to control small spills</li> <li>• ensure delivery contractors carry spill kits and are required to address minor spills during fuel deliveries</li> </ul> <p>Maintain all internal combustion engines and their pollution control devices in good working order.</p>
Geology and Soil Resources	Soil disturbance	<p>Use BMPs to reduce soil erosion (e.g., earth berms, dikes, and sediment fences).</p> <p>Promptly revegetate or cover bare areas with natural materials.</p> <p>Use water to control fugitive dust emissions.</p> <p>Use standard drilling and blasting techniques to minimize impact to bedrock, reducing the potential for over-excavation, thereby minimizing damage to the surrounding rock and protecting adjacent surfaces that are intended to remain intact.</p> <p>Place soil stockpiles generated in a manner to reduce erosion.</p> <p>Reuse onsite excavated materials whenever possible.</p> <p>Use a stormwater detention basin.</p>

**Table 5-1 Summary of Mitigation Measures Identified by AES for Preconstruction and Construction Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Geology and Soil Resources (Cont.)		<p>Follow the requirements of a Spill Prevention Control and Countermeasures (SPCC) Plan to reduce the potential impacts from chemical spills or releases around vehicle maintenance and fueling locations, storage tanks, and painting operations, and ensure prompt and appropriate cleanup.</p>
		<p>Follow appropriate waste management procedures to minimize the impacts on soils from solid waste and hazardous materials that would be generated during all phases. Where practicable, implement a recycling program for materials suitable for recycling.</p>
Water Resources	Water quality	<p>Employ BMPs to control the use of hazardous materials and fuels.</p> <p>Maintain construction equipment in good repair without visible leaks of oil, greases, or hydraulic fluids.</p> <p>Control and mitigate spills in conformance with the Spill Prevention Control and Countermeasure (SPCC) Plan.</p> <p>Ensure discharges to surface impoundments meet the standards for stormwater and treated domestic sanitary wastewater, and that no radiological discharges are made.</p> <p>Use BMPs to control stormwater runoff to prevent releases to nearby areas to the extent possible.</p> <p>Use BMPs for dust control associated with excavation and fill operations. Water conservation will be considered when deciding how often dust suppression sprays will be applied.</p> <p>Use silt fencing and/or sediment traps.</p> <p>Use only water (no detergents) for external vehicle washing.</p> <p>Place stone construction pads at entrance/exits where an unpaved construction access adjoins a State road.</p> <p>Arrange all temporary construction basins and permanent basins to provide for the prompt, systematic sampling of runoff in the event of any special needs.</p> <p>Control water quality impacts by compliance with the National Pollution Discharge Elimination System (NPDES) Construction General Permit requirements and by applying BMPs as detailed in the proposed site's Stormwater Pollution Prevention Plan (SWPPP).</p>

**Table 5-1 Summary of Mitigation Measures Identified by AES for Preconstruction and Construction Environmental Impacts (Cont.)**

<b>Impact Area</b>	<b>Activity</b>	<b>Mitigation Measures</b>
Water Resources (Cont.)		Implement a SPCC Plan for the proposed facility to identify potential spill substances, sources, and responsibilities.
		Berm or self-contain all aboveground gasoline and diesel storage tanks.
		Construct curbing, pits, or other barriers around tanks and components containing radioactive wastes.
		Handle any hazardous materials by approved methods and ship offsite to approved disposal sites. Handle sanitary wastes by portable systems until the Domestic Sanitary Sewage Treatment Plant is available for site use. Provide an adequate number of these portable systems.
		Require control of surface water runoff for activities covered by the NPDES Construction General Permit.
	Water use	Use low-water-consumption landscaping rather than conventional landscaping to reduce water usage.
		Implement conservation practices when spraying water for dust control.
Ecological Resources	Habitat and wildlife disturbance	Manage unused open areas (i.e., leave undisturbed), including areas of native grasses and shrubs, for the benefit of wildlife.
		Use native plant species (i.e., low-water-consuming plants) to revegetate disturbed areas, to enhance wildlife habitat.
		Fence the stormwater discharge basins to limit access by wildlife.
		Reduce vehicle speeds onsite.
		Use BMPs to minimize dust. Apply water at least twice daily, when needed, to control dust in construction areas, in addition to other fugitive dust prevention and control methods.
		Focus all lights downward.



**Table 5-1 Summary of Mitigation Measures Identified by AES for Preconstruction and Construction Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Ecological Resources (Cont.)		<p>Improve the existing boundary fence to ensure pronghorn access to the remaining habitat on the proposed site. The fence would include a smooth top wire no more than 42 inches above the ground, adequate wire spacing to prevent wildlife entanglement, a smooth bottom wire approximately 16 to 18 inches above the ground, and durable markers to increase wire visibility (AEA, 2010b).</p> <p>Remove livestock to improve sagebrush habitat.</p> <p>Take the following measures during construction and decommissioning of the proposed EREF to protect migratory birds:</p> <ul style="list-style-type: none"> <li>• perform clearing or removal of habitat, such as sagebrush, including buffer zones, outside of the migratory bird breeding and nesting season</li> <li>• survey additional areas to be cleared for active nests during migratory bird breeding and nesting season</li> <li>• avoid activities in areas containing active nests of migratory birds</li> <li>• consult the U.S. Fish and Wildlife Service (FWS) to determine the appropriate actions regarding the taking of migratory birds, if needed</li> </ul> <p>Use no herbicides during construction.</p> <p>Repair and stabilize any eroded areas, and collect sediment in a stormwater detention basin.</p> <p>Follow BMPs for temporary and permanent erosion and runoff control methods (as identified under Land Use).</p> <p>Consider all recommendations of appropriate State and Federal agencies, including the Idaho Department of Fish and Game and the FWS.</p>

**Table 5-1 Summary of Mitigation Measures Identified by AES for Preconstruction and Construction Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Noise	Exposure of workers and the public to noise	<p>Restrict most of US 20 use after twilight through early morning hours to minimize noise impacts to the nearest residence. Restrict usage of heavy truck and earthmoving equipment after twilight through early morning hours during construction of the access roads and highway entrances, to minimize noise impacts on the Hell’s Half Acre Wilderness Study Area.</p> <p>Perform construction or decommissioning activities with the potential for noise or vibration at residential areas that could have a negative impact on the quality of life, during the daytime hours (7:00 am–7:00 pm). If it is necessary to perform an activity that could result in excessive noise or vibration in a residential area after hours, notify the community in accordance with site procedures.</p> <p>Use engineered and administrative controls for equipment noise abatement, including the use of equipment and vehicle mufflers, acoustic baffles, shrouding, barriers, and noise blankets.</p> <p>Sequence construction or decommissioning activities to minimize the overall noise and vibration impact (e.g., establish the activities that can occur simultaneously or in succession).</p> <p>Use blast mats, if necessary.</p> <p>Create procedures for notifying State and local government agencies, residents, and businesses of construction or decommissioning activities that may produce high noise or vibration that could affect them.</p> <p>Post appropriate State highway signs warning of blasting.</p> <p>Create a Complaint Response Protocol for dealing with and responding to noise or vibration complaints, including entering the complaints into the proposed site’s Corrective Action Program.</p> <p>Establish and enforce onsite speed limits.</p>

**Table 5-1 Summary of Mitigation Measures Identified by AES for Preconstruction and Construction Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Transportation	Traffic volume	<p>Use the following BMPs to reduce traffic volumes, minimize noise, and minimize wildlife mortality:</p> <ul style="list-style-type: none"> <li>• encourage carpooling to minimize traffic due to employee travel</li> <li>• stagger shift changes to reduce the peak traffic volume on US 20</li> <li>• construct acceleration and deceleration lanes at the entrances to the proposed EREF site to improve traffic flow and safety on US 20</li> <li>• maintain low speed limits onsite to reduce noise and minimize impacts to wildlife</li> </ul>
	Deposition on roadways	<p>Use the following measures to minimize the release of dirt and other matter onto US 20:</p> <ul style="list-style-type: none"> <li>• promptly remove earthen materials on paved roads carried onto the roadway by wind, trucks, or earthmoving equipment</li> <li>• promptly stabilize or cover bare earthen areas once roadway and highway entrance earthmoving activities are completed</li> <li>• build gravel pads at the proposed EREF's entry/exit points along US 20 in accordance with the Idaho Department of Environmental Quality (IDEQ) <i>Catalog of Stormwater Best Management Practices for Idaho Cities and Counties, Volume 2, Erosion and Sediment Controls</i> (IDEQ, 2009)</li> <li>• apply periodic top dressing of clean stone to the gravel pads, as needed, to maintain the effectiveness of the stone voids</li> <li>• perform tire washing, as needed, on a stabilized stone (gravel) area that drains to a sediment trap</li> <li>• prior to entering US 20, inspect vehicles for cleanliness from dirt and other matter that could be released onto the highway</li> <li>• cover open-bodied trucks (e.g., install tarps over open beds) to prevent debris from falling off or blowing out of vehicles onto the highway</li> </ul>

**Table 5-1 Summary of Mitigation Measures Identified by AES for Preconstruction and Construction Environmental Impacts (Cont.)**

<b>Impact Area</b>	<b>Activity</b>	<b>Mitigation Measures</b>
Waste Management	Generation of industrial and hazardous wastes (air and liquid emissions in Air Quality and Water Resources above)	Develop a construction phase recycling program.

Source: AES, 2010a.

**Table 5-2 Summary of Mitigation Measures Identified by AES for Operations Environmental Impacts**

<b>Impact Area</b>	<b>Activity</b>	<b>Mitigation Measures</b>
Visual and Scenic Resources	Potential visual intrusions in the character of the existing landscape	Use aesthetically pleasing screening measures such as berms and earthen barriers, natural stone, and other physical means to soften the impact of the buildings.
		Use neutral colors for structures.
		Limit lighting to that necessary to meet security requirements; focus lighting downward to reduce night lighting in the surrounding area.
Air Quality	Facility emissions of hazardous gases	<p>Apply BMPs to the design and operation of onsite vehicle and equipment fueling activities to minimize the release to the atmosphere of nonmethane hydrocarbons and mitigate the potential impact of spills or accidental releases; including:</p> <ul style="list-style-type: none"> <li>• equip storage tanks with appropriate VOC controls, liquid level gauges, and overfill protection</li> <li>• provide training to fuel delivery drivers</li> <li>• post appropriate warning signs at the fuel dispensing facility</li> <li>• pave fuel unloading and dispensing areas and equip them with curbs to control small spills</li> <li>• ensure delivery contractors carry spill kits and are required to address minor spills during fuel deliveries</li> </ul> <p>Install the Separations Building Module (SBM) Safe-by-Design Gaseous Effluent Vent System (GEVS) and SBM Local Extraction GEVS, which are designed to collect and clean all potentially hazardous gases from the plant prior to release to the atmosphere. Provide instrumentation to detect and signal, via alarm, all nonroutine process conditions, including the presence of radionuclides or hydrogen fluoride (HF) in the exhaust stream that will trip the system to a safe condition in the event of effluent detection beyond routine operational limits.</p>



**Table 5-2 Summary of Mitigation Measures Identified by AES for Operations  
Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Air Quality (Cont.)		<p>Install the Technical Services Building (TSB) GEVS, which is designed to collect and clean all potentially hazardous gases in the serviced areas from the TSB prior to release to the atmosphere. Provide instrumentation to detect and signal the Control Room, via alarm, regarding all nonroutine process conditions, including the presence of radionuclides or HF in the exhaust stream. Operators would then take appropriate actions to mitigate the release.</p>
		<p>Install the Centrifuge Test and Postmortem Facilities GEVSs, which are designed to collect and clean all potentially hazardous gases in the serviced areas from the Centrifuge Assembly Building prior to release to the atmosphere. Provide instrumentation to detect and signal the Control Room, via alarm, regarding all nonroutine process conditions, including the presence of radionuclides or HF in the exhaust stream. Operators would then take appropriate actions to mitigate the release.</p>
		<p>Design the TSB Contaminated Area heating, ventilating, and air conditioning (HVAC) system, the Ventilated Room HVAC System in the Blending, Sampling, and Preparation Building (BSPB), and the Centrifuge Test and Postmortem Facilities Exhaust Filtration System to collect and clean all potentially hazardous gases in the serviced areas prior to release to the atmosphere.</p>
	Fugitive dust and equipment emissions	<p>Apply gravel to the unpaved surface of the secondary access road.</p> <p>Impose speed limits on the unpaved secondary access road.</p> <p>Maintain air concentrations of criteria pollutants resulting from vehicle emissions and fugitive dust below the National Ambient Air Quality Standards.</p>
Geology and Soil Resources	Soil disturbance	<p>Follow the requirements of a Spill Prevention Control and Countermeasures (SPCC) Plan to reduce the potential impacts from chemical spills or releases around vehicle maintenance and fueling locations, storage tanks, and painting operations, and ensure prompt and appropriate cleanup.</p>
		<p>Follow appropriate waste management procedures to minimize the impacts on soils from solid waste and hazardous materials that would be generated. Where practicable, implement a recycling program for materials suitable for recycling.</p>

**Table 5-2 Summary of Mitigation Measures Identified by AES for Operations  
Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Water Resources	Water quality	<p>Employ BMPs to control the use of hazardous materials and fuels.</p> <p>Control and mitigate spills in conformance with the SPCC Plan.</p> <p>Ensure discharges to surface impoundments meet the standards for stormwater and treated domestic sanitary wastewater, and that no radiological discharges are made. Use BMPs to control stormwater runoff to prevent releases to nearby areas to the extent possible.</p> <p>Use only water (no detergents) for external vehicle washing.</p> <p>Arrange all temporary construction basins and permanent basins to provide for the prompt, systematic sampling of runoff in the event of any special needs.</p> <p>Berm or self-contain all aboveground gasoline and diesel storage tanks.</p> <p>Construct curbing, pits, or other barriers around tanks and components containing radioactive wastes.</p> <p>Handle any hazardous materials by approved methods and ship offsite to approved disposal sites. Handle sanitary wastes by portable systems until the Domestic Sanitary Sewage Treatment Plant is available for site use. Provide an adequate number of these portable systems.</p> <p>Use evaporators in the Liquid Effluent Collection and Treatment System, thereby eliminating the need to discharge treated process water to an onsite basin.</p>
	Water use	<p>Use low-water-consumption landscaping rather than conventional landscaping to reduce water usage.</p> <p>Install low-flow toilets, sinks, and showers to reduce water usage.</p> <p>Implement localized floor washing using mops and self-contained cleaning machines rather than conventional washing with a hose to reduce water usage.</p> <p>Incorporate closed-loop cooling systems instead of cooling towers, thereby eliminating evaporative losses and cooling tower blowdown, resulting in reduced water usage.</p>

**Table 5-2 Summary of Mitigation Measures Identified by AES for Operations  
Environmental Impacts (Cont.)**

<b>Impact Area</b>	<b>Activity</b>	<b>Mitigation Measures</b>
Ecological Resources	Habitat disturbance	<p>Reduce vehicle speeds onsite.</p> <p>Focus all lights downward.</p> <p>Use herbicides in limited amounts during operations along access roads, industrial area, and security fence surrounding the proposed facility. Use herbicides according to government regulations and manufacturer's instructions to control noxious weeds.</p> <p>Reseed cropland areas on the proposed site with native species when the proposed EREF becomes operational.</p> <p>Consider all recommendations of appropriate State and Federal agencies, including the Idaho Department of Fish and Game and the FWS.</p>
Noise	Exposure of workers and the public to noise	<p>Mitigate operational noise sources primarily by plant design, whereby cooling systems, valves, transformers, pumps, generators, and other facility equipment are located mostly within plant structures and the buildings absorb the majority of the noise located within.</p> <p>Restrict most of US 20 use after twilight through early morning hours to minimize noise impacts to the nearest residence.</p> <p>Establish preventative maintenance programs that ensure all equipment is working at peak performance.</p>
Transportation	Traffic volume	<p>Encourage carpooling to minimize traffic due to employee travel.</p> <p>Stagger shift changes to reduce the peak traffic volume on US 20.</p> <p>Maintain low speed limits onsite to reduce noise and minimize impacts to wildlife.</p>

**Table 5-2 Summary of Mitigation Measures Identified by AES for Operations  
Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Public and Occupational Health	Nonradiological effects	<p>Design process systems that handle uranium hexafluoride (UF<sub>6</sub>) to operate at subatmospheric pressure, to minimize outward leakage of UF<sub>6</sub>.</p> <p>Direct process off-gas from UF<sub>6</sub> purification and other operations through cold traps to solidify and reclaim as much UF<sub>6</sub> as possible. Pass remaining gases through high-efficiency filters and chemical absorbers to remove HF and uranic compounds.</p> <p>Monitor all UF<sub>6</sub> process systems by instrumentation that will activate alarms in the Control Room and will either automatically shut down the proposed facility to a safe condition or alert operators to take the appropriate action to prevent release in the event of operational problems.</p> <p>Investigate alternative solvents or apply control technologies for methylene chloride solvent use.</p> <p>Use administrative controls, practices, and procedures to assure compliance with the proposed EREF's Health, Safety, and Environmental Program. Design the program to ensure safe storage, use, and handling of chemicals to minimize the potential for worker exposure.</p>
	Radiological effects	<p>Put in place radiological practices and procedures to ensure compliance with the proposed EREF's Radiation Protection Program. Design the program to achieve and maintain radiological exposure to levels that are as low as reasonably achievable (ALARA).</p> <p>Conduct routine facility radiation and radiological surveys to characterize and minimize potential radiological dose/exposure.</p> <p>Monitor all radiation workers by use of dosimeters and area air sampling to ensure that radiological doses remain within regulatory limits and are ALARA.</p> <p>Provide radiation monitors in the gaseous effluent vents to detect and alarm and effect the automatic safe shutdown of process equipment in the event contaminants are detected in the system exhaust. Design systems to automatically shut down, switch trains, or rely on operator actions to mitigate the potential release.</p>

**Table 5-2 Summary of Mitigation Measures Identified by AES for Operations  
Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Public and Occupational Health (Cont.)		<p>Design the proposed facility to delay and reduce UF<sub>6</sub> releases inside the buildings in a potential fire incident from reaching the outside environment, including automatic shutoff of room HVAC systems during a fire event.</p> <p>Design process systems that handle uranium hexafluoride (UF<sub>6</sub>) to operate at subatmospheric pressure, to minimize outward leakage of UF<sub>6</sub>.</p> <p>Move UF<sub>6</sub> cylinders only when cool and when UF<sub>6</sub> is in solid form, to minimize the risk of inadvertent release due to mishandling.</p> <p>Direct process off-gas from UF<sub>6</sub> purification and other operations through cold traps to solidify and reclaim as much UF<sub>6</sub> as possible. Pass remaining gases through high-efficiency filters and chemical absorbers to remove HF and uranic compounds.</p> <p>Separate uranic compounds and various other heavy metals in waste material generated by decontamination of equipment and systems.</p> <p>Use liquid and solid waste handling systems and techniques to control wastes and effluent concentrations.</p> <p>Pass gaseous effluent through pre-filters, high-efficiency particulate air (HEPA) filters and activated carbon filters to reduce the radioactivity in the final discharged effluent to very low concentrations.</p> <p>Route process liquid waste to collection tanks and treat through a combination of precipitation, evaporation, and ion exchange to remove most of the radioactive material prior to a final evaporation step to preclude any liquid effluent release from the proposed facility.</p> <p>Monitor all UF<sub>6</sub> process systems by instrumentation that will activate alarms in the Control Room and will either automatically shut down the proposed facility to a safe condition or alert operators to take the appropriate action to prevent release in the event of operational problems.</p>



**Table 5-2 Summary of Mitigation Measures Identified by AES for Operations  
Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Waste Management	Generation of industrial, hazardous, radiological, and mixed wastes (air emissions are addressed under Air Quality and liquid emissions are addressed under Water Resources)	<p>Design system features to minimize the generation of solid waste, liquid waste, and gaseous effluent (gaseous effluent design features are described above under Public and Occupational Health).</p> <p>Store waste in designated areas of the proposed facility until an administrative limit is reached, then ship offsite to a licensed disposal facility; no disposal of waste onsite.</p> <p>Dispose of all radioactive and mixed wastes at offsite licensed facilities.</p> <p>Maintain a cylinder management program to monitor storage conditions on the Full Tails Cylinder Storage Pads, to monitor cylinder integrity by conducting routine inspections for breaches and to perform cylinder maintenance and repairs as needed.</p> <p>Store all tails cylinders filled with depleted UF<sub>6</sub> on saddles of concrete, or other suitable material, that do not cause corrosion of the cylinders. Place saddles on a concrete pad.</p> <p>Segregate the storage pad areas from the rest of the proposed enrichment facility by barriers, such as vehicle guard rails.</p> <p>Double stack depleted uranium tails cylinders on the storage pad, arrayed to permit easy visual inspection of all cylinders.</p> <p>Survey depleted uranium tails cylinders for external contamination (wipe test) prior to being placed on a Full Tails Cylinder Storage Pad or transported offsite.</p> <p>Fit depleted uranium tails cylinder valves with valve guards to protect the cylinder valves during transfer and storage.</p> <p>Make provisions to ensure that depleted uranium tails cylinders will not have defective valves (identified in NRC Bulletin 2003-03, "Potentially Defective 1-inch Valves for Uranium Hexafluoride Cylinders") (NRC, 2003) installed.</p> <p>Perform touch-up application of paint coating on depleted uranium tails cylinders if coating damage is discovered during inspection (UF<sub>6</sub> cylinder manufacturing will include abrasive blasting and coating with anticorrosion primer/paint, as required by specification).</p>

**Table 5-2 Summary of Mitigation Measures Identified by AES for Operations  
Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Waste Management (Cont.)		<p>Allow only designated vehicles, operated by trained and qualified personnel, on the Full Tails Cylinder Storage Pads, Full Feed Cylinder Storage Pads, Full Product Cylinder Storage Pad, and the Empty Cylinder Storage Pad (refer to the Integrated Safety Analysis Summary, Section 3.8, for controls associated with vehicle fires on or near the Cylinder Storage Pads.</p> <p>Inspect depleted uranium tails cylinders for damage prior to placing a filled cylinder on a storage pad. Annually reinspect depleted uranium tails cylinders for damage or surface coating defects. These inspections will verify that:</p> <ul style="list-style-type: none"> <li>• lifting points are free from distortion and cracking</li> <li>• cylinder skirts and stiffener rings are free from distortion and cracking</li> <li>• cylinder surfaces are free from bulges, dents, gouges, cracks, or significant corrosion</li> <li>• cylinder valves are fitted with the correct protector and cap</li> <li>• cylinders are inspected to confirm that the valve is straight and not distorted, two to six threads are visible, and the square head of the valve stem is undamaged</li> <li>• cylinder plugs are undamaged and not leaking</li> </ul> <p>If inspection of a depleted uranium tails cylinder reveals significant deterioration or other conditions that may affect the safe use of the cylinder, transfer the contents of the affected cylinder to another cylinder in good condition and discard the defective cylinder. Determine the root cause of any significant deterioration and, if necessary, make additional inspections of cylinders.</p> <p>Make available onsite proper documentation on the status of each depleted uranium tails cylinder, including content and inspection dates.</p> <p>Use the lined Cylinder Storage Pads Stormwater Retention Basins to capture stormwater runoff from the Full Tails Cylinder Storage Pads.</p> <p>Minimize power usage by efficient design of lighting systems, selection of high-efficiency motors, and use of proper insulation materials.</p>

**Table 5-2 Summary of Mitigation Measures Identified by AES for Operations  
Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Waste Management (Cont.)		<p>Control process effluents by means of the following liquid and solid waste handling systems and techniques:</p> <ul style="list-style-type: none"> <li>• follow careful application of basic principles for waste handling in all of the systems and processes</li> <li>• collect different waste types in separate containers to minimize contamination of one waste type with another; carefully package materials that can cause airborne contamination; provide ventilation and filtration of the air in the area as necessary; confine liquid wastes to piping, tanks, and other containers; use curbing, pits, and sumps to collect and contain leaks and spills</li> <li>• store hazardous wastes in designated areas in carefully labeled containers; also contain and store mixed wastes separately</li> <li>• neutralize strong acids and caustics before they enter an effluent stream</li> <li>• decontaminate and/or reuse radioactively contaminated wastes to reduce waste volume as far as possible</li> <li>• reduce the volume of collected waste such as trash, compressible dry waste, scrap metals, and other candidate wastes at a centralized waste processing facility</li> <li>• include administrative procedures and practices in waste management systems that provide for the collection, temporary storage, processing, and disposal of categorized solid waste in accordance with regulatory requirements</li> <li>• design handling and treatment processes to limit wastes and effluent. Perform sampling and monitoring to assure that plant administrative and regulatory limits will not be exceeded</li> <li>• monitor gaseous effluent for HF and radioactive contamination before release</li> <li>• sample and/or monitor liquid wastes in liquid waste treatment systems</li> <li>• sample and/or monitor solid wastes prior to offsite treatment and disposal</li> </ul>

**Table 5-2 Summary of Mitigation Measures Identified by AES for Operations  
Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Waste Management (Cont.)		<ul style="list-style-type: none"> <li>• return process system samples to their source, where feasible, to minimize input to waste streams</li> </ul> <p>Implement a spill control program for accidental oil spills. Prepare a Spill Prevention Control and Countermeasure (SPCC) Plan prior to the start of operation of the proposed facility or prior to the storage of oil on the proposed site in excess of <i>de minimis</i> quantities, which will contain the following information:</p> <ul style="list-style-type: none"> <li>• identification of potential significant sources of spills and a prediction of the direction and quantity of flow that will likely result from a spill from each source</li> <li>• identification of the use of containment or diversionary structures such as dikes, berms, culverts, booms, sumps, and diversion ponds, at the proposed facility to control discharged oil</li> <li>• procedures for inspection of potential sources of spills and spill containment/diversion structures</li> <li>• assigned responsibilities for implementing the plan, inspections, and reporting</li> <li>• as part of the SPCC Plan, other measures will include control of drainage of rain water from diked areas, containment of oil and diesel fuel in bulk storage tanks, aboveground tank integrity testing, and oil and diesel fuel transfer operational safeguards</li> </ul> <p>Implement a nonhazardous materials waste recycling plan during operation. Perform a waste assessment to identify waste reduction opportunities and to determine which materials will be recycled. Contact brokers and haulers to find an end-market for the materials. Perform employee training on the recycling program so that employees will know which materials are to be recycled. Purchase and clearly label recycling bins and containers. Periodically evaluate the recycling program (i.e., waste management expenses and savings, recycling and disposal quantities) and report the results to the employees.</p>

Source: AES, 2010a.

## 5.2 Potential Mitigation Measures Identified by the NRC

This section presents additional potential mitigation measures that were identified by the NRC staff, following their evaluation of the potential environmental impacts of the proposed EREF in Chapter 4. Tables 5-3 and 5-4 list the NRC-identified mitigation measures for preconstruction/construction and operations, respectively.

## 5.3 References

(AES, 2010a) AREVA Enrichment Services, LLC. "Eagle Rock Enrichment Facility Environmental Report, Rev. 2." Bethesda, Maryland. April.

(AES, 2010b) AREVA Enrichment Services, LLC. Letter from J.A. Kay (Licensing Manager, AES) to Sharon W. Kiefer (Assistant Director-Policy, IDFG) dated December 7, 2010. "Subject: Response to IDFG Comments to NRC Related to the EREF Transmission Line." ADAMS Accession No. ML103420579.

(IDEQ, 2009) Idaho Department of Environmental Quality. "Catalog of Stormwater Best Management Practices for Idaho Cities and Counties, Volume 2: Erosion and Sediment Controls."

(NRC, 2003) U.S. Nuclear Regulatory Commission. "Potentially Defective 1-Inch Valves for Uranium Hexafluoride Cylinders." NRC Bulletin 2003-03. August.



**Table 5-3 Summary of Potential Mitigation Measures Identified by NRC  
for Preconstruction and Construction Environmental Impacts**

Impact Area	Activity	Mitigation Measures
Air Quality	Point source releases of criteria pollutants	<p>Ensure vehicles and equipment with internal combustion engines are properly tuned and pollution control devices are functional.</p> <p>Install hard-surface pavements, curbs, scupper drains, and drainage ways at fuel dispensing island that will channel spilled fuels to fire-safe containment sumps; require delivery drivers to remain in attendance throughout all fuel deliveries; place spill containment/response equipment at fuel dispensing stations.</p> <p>Provide first responder training to selected workers; ensure storage tanks are equipped with fully functional overflow and vapor control features.</p> <p>Install emergency shut-offs for fuel dispensing pumps; post spill response directives at the fuel dispensing islands; provide spill cleanup materials at the fuel dispensing islands for cleanup of small spills; ensure the fuel dispensing islands have adequate lighting.</p> <p>Adopt a policy that requires prompt cleanup of all spilled materials.</p> <p>Identify and select construction-related products and chemicals that are free of volatile solvents.</p> <p>Suspend high fugitive dust-generating activities during early morning hours with calm winds and during windy periods.</p>
Geology and Soil	Soil disturbance	<p>Minimize the construction footprint to the extent possible.</p> <p>Cover stockpiles to reduce exposure to wind and rain.</p> <p>Limit routine vehicle traffic to paved or gravel roads.</p>
Water Resources	Stormwater management	<p>Reduce the size of impervious surfaces (parking lots, roads, and roofs) to the extent possible; implement a “fix-it-first” infrastructure policy to set spending priorities on the repair of existing infrastructure over the installation of new infrastructure; and employ low-impact development strategies and practices during construction activities.</p>

**Table 5-3 Summary of Potential Mitigation Measures Identified by NRC  
for Preconstruction and Construction Environmental Impacts (Cont.)**

Impact Area	Activity	Mitigation Measures
Ecological Resources	Habitat disturbance	<p>Plant disturbed areas and irrigated crop areas with native sagebrush steppe species to establish native communities and prevent the establishment of noxious weeds. Plant immediately following the completion of disturbance activities and the abandonment of crop areas.</p> <p>Develop and implement a noxious weed control program to prevent the establishment and spread of invasive plant species. Hose down tires and undercarriage of off-road vehicles prior to site access to dislodge seeds or other propagules of noxious weeds. Monitor for noxious weeds throughout the construction and operations phases and immediately eradicate new infestations. Minimize indirect impacts of weed control activities, such as herbicide effects on nontarget species, and soil disturbance and fire hazards from vehicle operation in undisturbed areas during weed control activities.</p>
Noise	Exposure of workers and the public to noise	Suspend the use of explosives during periods when meteorological conditions (e.g., low cloud cover) can be expected to reduce sound attenuation.

**Table 5-4 Summary of Potential Mitigation Measures Identified by NRC for Operations Environmental Impacts**

Impact Area	Activity	Mitigation Measures
Water Resources	Stormwater management	<p>Reduce the size of impervious surfaces (parking lots, roads, and roofs) to the extent possible.</p> <p>Implement a “fix-it-first” infrastructure policy to set spending priorities on the repair of existing infrastructure over the installation of new infrastructure.</p> <p>Employ low-impact development strategies and practices during operations.</p>
Ecological Resources	Wildlife protection	<p>Develop areas that will retain water of suitable quality for wildlife and provide wildlife access to such areas with suitable water quality.</p> <p>For basins with water quality unsuitable for wildlife, use animal-friendly fencing and netting or other suitable material over basins to prevent use by migratory birds.</p> <p>Place metal reflectors on the top wire of the fence along the AES property boundary, to reduce sage-grouse mortality resulting from collisions with the fence.</p> <p>Coordinate with Idaho National Laboratory in monitoring risks to sage-grouse and other sensitive species and identifying measures to reduce risks and protect these species and their habitat, particularly sagebrush steppe.</p> <p>Coordinate with Idaho Department of Fish and Game to determine corrective action or mitigation for the offsite public lands lost to wildlife due to project effects.</p>
Transportation	Traffic volume	<p>Consider working with INL to operate a joint bus system.</p> <p>Establish shift changes outside of INL peak commuting periods.</p>
Public and Occupational Health	Radiological effects	<p>Store “empty” cylinders with heels in the middle of a storage pad between full tail cylinders to reduce external exposure to workers.</p>

1                   **6 ENVIRONMENTAL MEASUREMENT AND MONITORING PROGRAMS**  
2

3 This chapter describes the proposed measurement and monitoring programs that would be  
4 used by AREVA Enrichment Services, LLC (AES) to characterize the effects on human health  
5 and the environment of radiological and nonradiological releases from the proposed Eagle Rock  
6 Enrichment Facility (EREF) in Bonneville County, Idaho. This proposed program includes direct  
7 monitoring of radiological and physiochemical (i.e., chemical and meteorological properties that  
8 affect measurements) gaseous and liquid effluents from facility operations, and monitoring and  
9 measurement of ambient air, surface water, groundwater, stormwater, soil, sediment, and direct  
10 radiation in the vicinity of the proposed EREF during preconstruction, construction, and  
11 operation.  
12

13 **6.1 Radiological Measurements and Monitoring Program**  
14

15 The U.S. Nuclear Regulatory Commission (NRC) requires that a radiological monitoring  
16 program be established for the proposed EREF to monitor and report the release of radiological  
17 gaseous and liquid effluents to the environment. These requirements are specified in Title 10,  
18 “Energy,” of the U.S. *Code of Federal Regulations* (10 CFR) Part 20, Appendix B,  
19 and 10 CFR 70.59. Table 6-1 lists the NRC guidance documents that apply to the radiological  
20 monitoring program. The NRC staff has reviewed engineering designs and proposed  
21 operational procedures submitted by AES in order to identify the locations and activities  
22 associated with potential emissions and effluents with radiologic character, and has verified that  
23 the pathways for these releases to the environment are appropriately represented in the  
24 proposed radiological monitoring program. Those pathways for environmental release are  
25 summarized below.  
26

27 Radiological monitoring at the proposed EREF would be addressed through the Effluent  
28 Monitoring Program (EMP) and the Radiological Environmental Monitoring Program (REMP).  
29 The EMP addresses the monitoring, recording, and reporting of data for radiological  
30 contaminants emitted from specific points. Physical samples collected for analysis in this  
31 program would include exhaust vent air sampler filters, filters from mobile air monitors, and  
32 liquid condensate from the evaporator exhaust vent. Corrective actions would be implemented  
33 if action levels are exceeded. The REMP addresses the monitoring of general environmental  
34 media (i.e., soil, sediment, groundwater, biota, and ambient air) within and outside the proposed  
35 EREF property boundary. The REMP will be initiated at least two years prior to the start of plant  
36 operations in order to develop a baseline (AES, 2010a). In addition, the REMP may be  
37 enhanced as necessary to maintain the collection and reliability of environmental data based on  
38 changes to regulatory requirements or facility operations (AES, 2010a). Every six months, AES  
39 will submit a summary report of the environmental sampling program at the proposed EREF to  
40 the NRC (AES, 2010a). Monitoring locations are shown in Figure 6-1. Data collected under this  
41 program would be used to assess radiological impacts on the environment and estimate  
42 potential impacts on the public. The REMP would be used to confirm the effectiveness of the  
43 effluent controls and the EMP and to verify that facility operations do not result in detrimental  
44 radiological impacts on the environment.  
45

46 As discussed in the following sections, radiological measurement and monitoring would include  
47 monitoring of air emissions, ambient air quality, wastewater discharge, stormwater and basin  
48 sediment, groundwater, and soil and vegetation, along with direct gamma radiation monitoring.

**Table 6-1 NRC Guidance Documents Relevant to Radiological Monitoring Programs**

Guidance	Purpose and Content
Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment" <sup>a</sup>	Provides acceptable methods for designing a program to ensure the quality of the results of measurements for radioactive materials in the effluents and the environment outside of nuclear facilities during normal operations.
Regulatory Guide 4.16, "Liquid and Gaseous Effluents from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants" <sup>b</sup>	Provides descriptions of acceptable methods for submitting semiannual reports that specify the quantity of each principal radionuclide released to unrestricted areas to estimate the maximum potential annual doses to the public resulting from such releases.

<sup>a</sup> NRC, 1979.

<sup>b</sup> NRC, 1985.

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**6.1.1 Air Emissions Monitoring**

The Air Emissions Monitoring Program would monitor each individual point source or pathway of potential radioactive airborne release to the atmosphere from the proposed EREF. Radioactive airborne releases of gaseous effluents could result from the following events or activities:

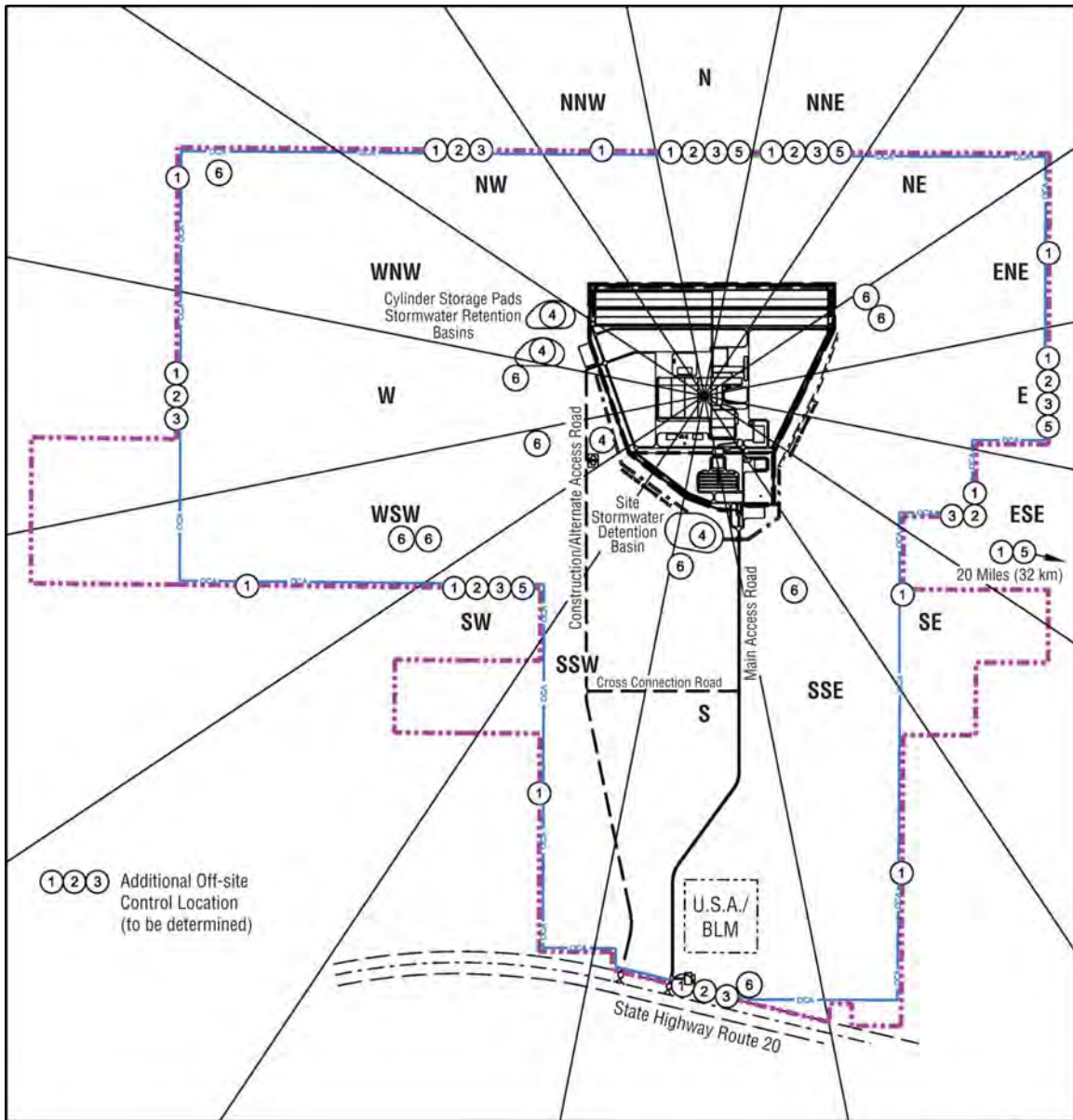
- controlled releases of gaseous effluents from ventilation stacks
- controlled gaseous releases from the uranium enrichment equipment during decontamination and maintenance of equipment
- handling, temporary storage, and transportation of uranium hexafluoride (UF<sub>6</sub>) feed cylinders, product cylinders, and depleted uranium cylinders

Monitoring for radioactive air emissions from the proposed EREF is conducted as part of the EMP, which would monitor, report, and record data on radiological contaminants released to the atmosphere from specific point sources. Gaseous effluents from the proposed EREF that have the potential for airborne radioactivity would be discharged from the sources listed below, and monitoring and sampling at these locations would be conducted in accordance with NRC Regulatory Guide 4.16 (NRC, 1985). These sources would all lie within the industrial footprint of the proposed EREF; however, the precise locations of these effluent points have been withheld as security-related information. Table 6-2 provides a summary of the EMP for gaseous discharges (AES, 2010a). Additional details on the exhaust vents enrolled in the monitoring program are provided below.

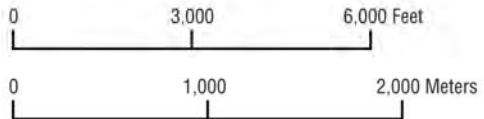
- **Separations Building GEVSS.** Each of the four Separations Building Modules (SBMs) would have exhaust vents on its roof. Each vent would be continuously monitored for alpha radiation and hydrogen fluoride (HF).<sup>1</sup> In addition, samples would undergo uranium isotopic

<sup>1</sup> In the strict sense, HF is not released as a result of EREF operations. Instead, trace amounts of UF<sub>6</sub> could be released from the pollution control devices installed on building and processing area ventilation systems. The UF<sub>6</sub> would be immediately hydrolyzed by the humidity in the ambient air, resulting in the formation of HF.





- Property Line
- OCA — Owner Controlled Area Fence (10 Feet (3 Meters) Inside of Property Line)
- ① Thermoluminescent Dosimeter
- ② Soil Sample
- ③ Vegetation Sample
- ④ Water Sample/Sediment Sample
- ⑤ Continuous Airborne Particulate Sample
- ⑥ Groundwater Well Sample



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**Figure 6-1 Proposed Radiological Sampling Stations and Monitoring Locations (AES, 2010a)**

**Table 6-2 EREF Proposed Gaseous Effluent Monitoring Program**

Sample Location	Sample Type	Analysis/ Frequency
<ul style="list-style-type: none"> <li>• Separation Building GEVS exhaust vents</li> <li>• TSB GEVS exhaust vent</li> <li>• TSB Contaminated Area HVAC System exhaust vent</li> <li>• Centrifuge Test and Postmortem Facilities GEVS exhaust vent<sup>a</sup></li> <li>• Centrifuge Test and Postmortem Facilities exhaust filtration system exhaust vent<sup>a</sup></li> <li>• Ventilated Room HVAC System exhaust vent</li> </ul>	Continuous air monitoring for particulates	Gross alpha/beta weekly; isotopic analysis on quarterly composite sample <sup>b</sup>
Evaporator	Continuous liquid condensate from exhaust vent	Gross alpha/beta weekly; isotopic analysis on quarterly composite sample <sup>b</sup>
Process areas <sup>c</sup>	Local area continuous air particulate filter <sup>d</sup>	Gross alpha/beta weekly; isotopic analysis on quarterly composite sample <sup>b</sup>
Nonprocess areas <sup>c</sup>	Local area continuous air particulate filter <sup>d</sup>	Gross alpha/beta on quarterly composite sample <sup>b</sup>

<sup>a</sup> Continuous sampling protocols are in effect only when this proposed facility is operational.

<sup>b</sup> Isotopic analyses for uranium isotopes (<sup>238</sup>U, <sup>236</sup>U, <sup>235</sup>U, and <sup>234</sup>U) would commence whenever gross alpha and gross beta activities indicate that an individual radionuclide could be present in a concentration >10 percent of the specified concentrations in Table 2 of Appendix B to 10 CFR Part 20.

<sup>c</sup> Process areas include any area or facility at which UF<sub>6</sub> transfers between feed, product, or tails cylinders occur, including areas where cylinders containing UF<sub>6</sub> are opened for testing, inspection, or sampling. A nonprocess area is any area or facility where uranic material is present in an open form.

<sup>d</sup> Mobile devices may be used to collect the necessary samples.

Source: AES, 2010a.

- 1  
2 analysis quarterly or if the gross alpha and gross beta activities indicate that an individual  
3 radionuclide could be present in a concentration greater than 10 percent of the  
4 concentrations specified in Table 2, Appendix B, of 10 CFR Part 20.  
5  
6 • **Technical Services Building GEVS.** This system would discharge to a vent on the  
7 Technical Support Building (TSB) roof. The vent would be continuously monitored for alpha  
8 radiation and HF. In addition, samples would undergo uranium isotopic analysis quarterly or  
9 if the gross alpha and gross beta activities indicate that an individual radionuclide could be  
10 present in a concentration greater than 10 percent of the concentrations specified in  
11 Table 2, Appendix B, of 10 CFR Part 20.  
12  
13 • **Centrifuge Test and Postmortem Facilities GEVS.** This system would discharge through  
14 an exhaust vent on the roof of the Centrifuge Assembly Building (CAB). The Centrifuge

1 Test and Postmortem Facilities GEVS vent-sampling system would provide for continuous  
2 monitoring and periodic sampling of the gaseous effluent in the exhaust vent. The exhaust  
3 vent would be continuously monitored for alpha radiation and HF. In addition, samples  
4 would undergo uranium isotopic analysis quarterly or if the gross alpha and gross beta  
5 activities indicate that an individual radionuclide could be present in a concentration greater  
6 than 10 percent of the concentrations specified in Table 2 of Appendix B to 10 CFR Part 20.  
7

- 8 • **Centrifuge Test and Postmortem Facilities Exhaust Filtration System.** When  
9 operational, this system would maintain a negative pressure with the Centrifuge Test and  
10 Postmortem Facilities, thus reducing the potential for radiologic contamination of adjacent  
11 areas. The system would discharge through an exhaust vent on the roof of the CAB.  
12 Sampling of this vent for alpha radiation and HF would occur only when the Centrifuge Test  
13 Facility or the Centrifuge Postmortem Facility are in operation.  
14
- 15 • **TSB Contaminated Area HVAC System.** This vent would be continuously monitored for  
16 alpha radiation and HF. In addition, samples would undergo uranium isotopic analysis  
17 quarterly or if the gross alpha and gross beta activities indicate that an individual  
18 radionuclide could be present in a concentration greater than 10 percent of the  
19 concentrations specified in Table 2, Appendix B, of 10 CFR Part 20.  
20
- 21 • **BSPB Ventilated Room HVAC System.** The vent would be continuously monitored for  
22 alpha radiation and HF. In addition, samples would undergo uranium isotopic analysis  
23 quarterly or if the gross alpha and gross beta activities indicate that an individual  
24 radionuclide could be present in a concentration greater than 10 percent of the  
25 concentrations specified in Table 2, Appendix B, of 10 CFR Part 20.  
26

27 In addition to the specific exhaust vents described above, all HVAC systems serving process  
28 areas where radioactive airborne contamination is possible would be designed to allow access  
29 for periodic sampling of exhaust air in accordance with NRC Regulatory Guide 4.16  
30 (NRC, 1985). Periodic sampling would also occur in nonprocess areas, and may include the  
31 use of mobile continuous air monitors (see Table 6-2).  
32

33 Sample analysis would employ methodologies with minimum detectable concentrations (MDC)  
34 of  $1.8 \times 10^{-9}$  becquerel per milliliter ( $5.0 \times 10^{-14}$  microcurie per milliliter), a value representing  
35 5 percent of the limit of  $1.0 \times 10^{-12}$  microcurie per milliliter set by the NRC in 10 CFR Part 20,  
36 Appendix B, Table 2, "Effluent Concentrations (retention Class W)."  
37

38 In addition, a separate vent on the TSB roof would be designed to allow for the capture and  
39 sampling of air and condensate from saturated air delivered to the TSB vent from the evaporator  
40 of the Liquid Effluent Collection and Treatment System. Periodic sampling of both the discharge  
41 air and condensate for isotopic uranium would take place. The evaporator condensate samples  
42 would be analyzed to a MDC equivalent to 5 percent or less of the 10 CFR Part 20, Appendix B,  
43 Table 2, Column 1 (Air), value for retention Class W.  
44

45 In addition to the pollution control devices affixed to each point source of potential radiological  
46 effluent release, administrative action levels would be established for effluent samples and  
47 monitoring instrumentation as an additional element of the effluent control procedure. All action  
48 levels would be established sufficiently low so as to permit implementation of corrective actions

1 before regulatory limits are exceeded. Effluent sample analytical results that exceed the action  
2 levels would precipitate an investigation into the source of elevated radioactivity. For example,  
3 radiological analyses would be performed more frequently on ventilation air filters if there were a  
4 significant increase in gross radioactivity or when a process change or other circumstances  
5 cause significant changes in radioactivity concentrations. Additional corrective actions would be  
6 implemented based on the level, automatic shutdown programming, and operating procedures  
7 that would be developed in the detailed alarm design phase. Under routine operating  
8 conditions, controls and interventions would ensure that radioactive material in gaseous  
9 effluents discharged from the proposed facility would comply with regulatory release criteria at  
10 all times.

11  
12 Compliance with regulatory release criteria would be demonstrated through effluent and  
13 environmental sampling data. Meteorological data from an onsite station would be continuously  
14 collected and used to assess the impacts of accidental releases.

15  
16 As part of the proposed EREF EMP, the gaseous effluent sampling program supports the  
17 determination of the quantity and concentration of radionuclides discharged from the proposed  
18 facility as well as the collection of other information required to be reported to the NRC or to  
19 demonstrate compliance with State and Federal regulations and permits. All potentially  
20 radioactive effluents from the proposed EREF would be discharged through monitored  
21 pathways. All effluent monitoring instruments would be capable of attaining a minimum  
22 detectable concentration (MDC) of at least  $1.8 \times 10^{-9}$  becquerel per milliliter  
23 ( $5.0 \times 10^{-14}$  microcurie per milliliter) and would be subject to periodic maintenance and  
24 calibration, functional tests to verify operability, and appropriate quality controls.

25  
26 Uranium compounds expected in the gaseous effluent could include depleted hexavalent  
27 uranium, triuranium octaoxide ( $U_3O_8$ ), and uranyl fluoride ( $UO_2F_2$ ), and the uranium isotopes  
28 uranium-238 ( $^{238}U$ ), uranium-236 ( $^{236}U$ ), uranium-235 ( $^{235}U$ ), and uranium-234 ( $^{234}U$ ) would be  
29 expected to be the prominent radionuclides. Representative samples would be collected from  
30 each release point identified above. Effluent data would be maintained, reviewed, and  
31 assessed by the EREF Radiation Protection Manager to ensure that gaseous effluent  
32 discharges comply with regulatory release criteria for uranium.

### 33 34 **6.1.2 Ambient Air Quality Monitoring**

35  
36 While the EMP's Air Emissions Monitoring Program described above (Section 6.1.1) monitors  
37 each individual point source or pathway of potential radioactive airborne release to the  
38 atmosphere from the proposed EREF, the REMP's Ambient Air Quality Monitoring Program  
39 monitors general air quality within and beyond the proposed EREF property boundary, collecting  
40 data at various locations around and outside the property.

41  
42 Continuous monitoring for airborne radioactive particulate would be conducted at five locations  
43 – two along the north property boundary of the proposed EREF; one along the south boundary  
44 at a point closest to the industrial area; one on the east property boundary in the direction of the  
45 closest residence, approximately 8 kilometers (5 miles) away (Figure 6-1); and one located  
46 32 kilometers (20 miles) to the east in Idaho Falls. These sampling locations have been  
47 selected in accordance with the NUREG-1302, "Offsite Dose Calculation Manual Guidance:  
48 Standard Radiological Effluent Controls for Boiling Water Reactors" (NRC, 1991) and are based

1 on consideration of the locations of effluent point sources within the proposed EREF industrial  
2 area, meteorological data (the most prevalent wind directions experienced at the proposed site),  
3 and current and projected surrounding land uses. In addition, because particulate releases can  
4 be expected to behave primarily as ground-level plumes with particulate concentrations  
5 diminishing rapidly and uniformly with distance from the source, and because radioactive  
6 emissions during routine operations are expected to be very low, sampling at the proposed  
7 property boundaries, rather than at locations more distant from the sources, is expected to  
8 represent worst-case conditions and the best opportunity to detect released radioactivity.

9  
10 Particulate monitoring is an element of the proposed EREF REMP and is designed to collect  
11 representative samples that yield data that demonstrate the effectiveness of effluent controls  
12 and the EMP. Samples would be retrieved biweekly; however, periods of heavy concentrations  
13 of airborne dust may require more frequent sample retrieval. All samples collected from the  
14 particulate monitors would be analyzed in the onsite laboratory; however, for quality control  
15 purposes and as a contingency, samples may sometimes be shipped to an independent offsite  
16 laboratory for analysis.

17  
18 Sample analysis for gross alpha would employ methodologies with MDC of  $1.8 \times 10^{-9}$  becquerel  
19 per milliliter ( $5.0 \times 10^{-14}$  microcuries per milliliter), a value representing 5 percent of the limit of  
20  $1.0 \times 10^{-12}$  microcurie per milliliter set by the NRC in 10 CFR Part 20, Appendix B, Table 2,  
21 "Effluent Concentrations (retention Class W)." Quality controls on sample recovery, handling,  
22 and analysis would be sufficient to validate results in accordance with Regulatory Guide 4.15  
23 (NRC, 1979).

### 24 25 **6.1.3 Wastewater Discharge Monitoring**

26  
27 The proposed EREF design includes liquid waste processing to remove uranic material from the  
28 waste stream by precipitation, filtration, and evaporation. There would be no direct discharge of  
29 process liquid waste effluents onsite or offsite. Therefore, no sampling of liquid process waste  
30 effluents, beyond that described in Table 6-3, is planned. Potentially contaminated liquid  
31 wastes would be processed via the facility's Liquid Effluent Collection and Treatment System.  
32 Uranic material would be removed from liquid waste effluents through two stages of precipitation  
33 and filtration. Liquid waste effluents would be sampled on an as-needed basis for isotopic  
34 analysis before being discharged to the Liquid Effluent Treatment System Evaporator. The final  
35 process stage of evaporation would release the resulting distillate steam directly to the  
36 atmosphere without condensing vapor out of the air stream. Since multiple stages of  
37 precipitation, filtration, and evaporation would be used to treat liquid effluents, no significant  
38 releases of uranic material to the environment would be expected. However, liquid condensate  
39 in the treatment system evaporator exhaust vent would be sampled periodically as part of the  
40 proposed site's radiological monitoring program to confirm that no uranic releases have  
41 occurred (Table 6-3). The composition of the sediment layer of the Liquid Effluent Treatment  
42 System Evaporator would also be characterized periodically by isotopic analysis. This data  
43 would be evaluated along with nearby air monitoring data to identify any potential resuspension  
44 of particles in the air (AES, 2010a).

45  
46 The Domestic Sanitary Sewage Treatment Plant would receive only domestic sanitary wastes.  
47 No plant process-related effluents would be introduced and no releases of uranic material to the  
48 environment would be expected. However, sampling of liquid sanitary waste effluents for



**Table 6-3 Radiological Sampling and Analysis Program for Liquid Waste Effluents**

<b>Sample Type</b>	<b>Location</b>	<b>Sampling Frequency</b>	<b>Type of Analysis</b>
<b><u>Wastewater Discharge</u></b>			
Liquid effluent	Collection tanks	TBD <sup>a</sup> ; liquid	Isotopic analysis <sup>b</sup>
Liquid condensate	Treatment system evaporator exhaust vent	Weekly	Gross alpha/beta
	Treatment system evaporator exhaust vent	Quarterly; composite sample	Isotopic analysis <sup>b</sup>
Sediment	Evaporator	TBD <sup>a</sup> 1 to 2 kg (2.2 to 4.4 lb) sediment	Isotopic analysis <sup>b</sup>
Treated domestic sanitary wastewater	TBD <sup>c</sup>	Semiannually; 1 to 2 kg (2.2 to 4.4 lb) solid fraction	Isotopic analysis <sup>b</sup>
<b><u>Stormwater and Basin Sediment</u></b>			
Stormwater	Once from each of the three stormwater basins	Quarterly; 4-L (1.1-gal) samples	Isotopic analysis <sup>b</sup>
Sediment	One from each of three stormwater basins	Quarterly; 1 to 2 kg (2.2 to 4.4 lb) sediment	Isotopic analysis <sup>b</sup>
<b><u>Groundwater</u></b>			
Groundwater	Nine deep wells and one shallow well located downgradient, cross gradient, and upgradient of proposed EREF	Semiannually; 4-L (1.1-gal) samples	Isotopic analysis <sup>b</sup>

<sup>a</sup> TBD = to be determined, as needed.

<sup>b</sup> Isotopic analysis for <sup>234</sup>U, <sup>235</sup>U, <sup>236</sup>U, and <sup>238</sup>U.

<sup>c</sup> TBD = to be determined (but prior to discharge to retention basin).

Source: AES, 2010a.

1  
2 isotopic analysis prior to discharge (to the Cylinder Storage Pads Stormwater Retention Basins)  
3 is planned as part of the proposed site's radiological monitoring program to confirm that no  
4 uranic releases have occurred (AES, 2010a).  
5

6 **6.1.4 Stormwater and Basin Sediment Monitoring**  
7

8 Three stormwater basins would collect stormwater runoff at the proposed EREF: one Site  
9 Stormwater Detention Basin, which would receive general site runoff, and two Cylinder Storage  
10 Pads Stormwater Retention Basins, which would receive stormwater runoff from the Cylinder  
11 Storage Pads and treated discharge from the Domestic Sanitary Sewage Treatment Plant. All  
12 three basins would be included in the proposed site's radiological monitoring program for liquid  
13 waste effluents (AES, 2010a).  
14

1 Discharge from the Site Stormwater Detention Basin would occur only by evaporation and  
2 infiltration into the ground. Although the basin would be designed to have an outlet structure for  
3 overflow, if needed during a storm event exceeding the design basis, it is not expected that  
4 runoff from this overflow would reach surface water bodies offsite (AES, 2010a). Therefore, no  
5 sampling of stormwater effluents other than for the stormwater basins listed in Table 6-3 is  
6 planned. Since the Site Stormwater Detention Basin would only receive stormwater runoff from  
7 paved surfaces (not including the Cylinder Storage Pad area), building roofs, and landscaped  
8 areas, no significant releases of uranic material to the environment would be expected.  
9 However, stormwater and sediment from the basin (when present) would be sampled  
10 periodically as part of the proposed site's radiological monitoring program to confirm that no  
11 uranic releases have occurred (Table 6-3).

12  
13 Discharge from the Cylinder Storage Pads Stormwater Retention Basins would occur only by  
14 evaporation. Although the basin would collect treated sanitary effluents and stormwater runoff  
15 from the concrete-paved areas in the cylinder storage areas, it would not receive process-  
16 related effluents. Therefore, no significant releases of uranic material to the environment would  
17 be expected. However, stormwater and sediment from these basins (when present) would be  
18 sampled periodically as part of the proposed site's radiological monitoring program to confirm  
19 that no uranic releases have occurred (Table 6-3).

#### 20 21 **6.1.5 Groundwater Monitoring**

22  
23 Groundwater samples from onsite monitoring wells would be collected semiannually for isotopic  
24 analysis as part of the proposed site's radiological monitoring program (AES, 2010a).  
25 Section 3.7.2.4 discusses the baseline monitoring for groundwater currently taking place on the  
26 proposed EREF property (baseline monitoring characterizes groundwater prior to construction  
27 and provides a basis for comparison once the plant becomes operational). The locations of the  
28 groundwater monitoring wells are shown in Figure 6-1. Monitoring well locations are based on  
29 the predominant direction of groundwater flow under the proposed EREF site, which is from the  
30 northeast to the southwest, and their proximity to key facility structures. During operation,  
31 samples would be collected twice a year from the same eight monitoring wells that were used  
32 for baseline monitoring and two new deep aquifer wells, which would be installed to the west  
33 and south of the facility footprint. These 10 wells would be used to characterize groundwater  
34 downgradient, cross gradient, and upgradient of the proposed EREF. Groundwater samples  
35 would be analyzed for uranium isotopes (Table 6-3). The minimum detectable concentrations  
36 (MDCs) for uranium analysis would be  $1.1 \times 10^{-4}$  becquerel per milliliter ( $3.0 \times 10^{-9}$  microcuries  
37 per milliliter), a value representing less than 2 percent of the annual limit of  $3.0 \times 10^{-7}$   
38 microcuries per milliliter for uranium isotopes in groundwater set by the NRC in 10 CFR Part 20,  
39 Appendix B, Table 2 (AES, 2010a).

40  
41 The Idaho Department of Environmental Quality (IDEQ) has a statewide network of wells it  
42 monitors to evaluate the overall quality of groundwater throughout the State to meet the  
43 objectives of the State's *Ground Water Quality Protection Act*. Any monitoring outside of the  
44 proposed EREF property boundary, therefore, would occur under the aegis of the State's  
45 groundwater quality monitoring program.

1 **6.1.6 Soil and Vegetation Sampling**  
2

3 Prior to the startup of operations at the proposed EREF, baseline vegetation and soil sampling  
4 would be conducted for the REMP. Samples would be collected quarterly from each sector at  
5 locations near the Owner Controlled Area fence line. The sectors, shown on Figure 6-1, are the  
6 areas identified with the 16 compass directions centered on the proposed EREF. Following the  
7 commencement of facility operations, sampling would be conducted semiannually from nine  
8 sample locations. One sample would be collected from each of eight sectors, three of which  
9 would be those with the highest predicted atmospheric deposition (see Figure 6-1). Samples  
10 would also be collected from an offsite control location. Vegetation and soil samples would be  
11 collected in the same vicinity. Vegetation samples may include vegetable crops and grass,  
12 according to availability. Vegetation and soil samples would each consist of 1–2 kilograms  
13 (2.2–4.4 pounds) of the sampled materials and would undergo isotopic analysis for uranium  
14 (AES, 2010a).  
15

16 **6.1.7 Direct Gamma Radiation Monitoring**  
17

18 The only significant sources of gamma emitting radionuclides would be due to the decay of <sup>235</sup>U  
19 and <sup>238</sup>U progeny associated with the stored UF<sub>6</sub> cylinders. Thermoluminescent dosimeters  
20 (TLDs) combined with computer modeling would be used to extrapolate dose from direct  
21 gamma radiation. The environmental TLDs would be placed along the Owner Controlled Area  
22 fence line. In addition, two TLDs would be placed at offsite locations for control purposes  
23 (AES, 2010a).  
24

25 The offsite TLD control samples would provide information on regional changes of the  
26 background radiation levels. The TLDs along the fence line would provide a combined reading  
27 of background as well as above background readings associated with the UF<sub>6</sub> cylinders. The  
28 dosimeters would be analyzed quarterly. The offsite dose equivalent associated with direct  
29 gamma radiation would be estimated through extrapolation of the TLD data using the Monte  
30 Carlo N-Particle (MCNP) (X5 Monte Carlo Team, 2003) or similar computer program  
31 (AES, 2010a).  
32

33 **6.1.8 Monitoring Procedures and Laboratory Standards**  
34

35 The monitoring procedures implemented in the radiological monitoring program would conform  
36 with the guidance found in NRC Regulatory Guide 4.15, “Quality Assurance for Radiological  
37 Monitoring Programs (Inception through Normal Operations to License Termination) – Effluent  
38 Streams and the Environment” (NRC, 1979).  
39

40 The monitoring procedures would employ well-known and acceptable sampling and analytical  
41 methods. Instrument maintenance and calibration programs would be developed on the basis  
42 of the given instrument in accordance with the manufacturers’ recommendations. Sampling and  
43 measuring equipment would be properly maintained and calibrated at regular intervals. These  
44 maintenance and calibration procedures would include ancillary equipment such as airflow  
45 meters. The radiological monitoring program implementation procedures would include  
46 functional testing and routine checks to demonstrate that monitoring and measuring instruments  
47 are in working condition.  
48

1 AES would periodically audit the effluent monitoring program. Quality assurance procedures  
2 would be implemented to ensure representative sampling, proper use of appropriate sampling  
3 methods and equipment, proper locations for sampling points, and proper handling, storage,  
4 transport, and analyses of effluent samples.

5  
6 Regulatory Guide 4.15 calls for the use of established standards such as those provided by the  
7 National Institute of Standards and Technology (NIST) as well as standard analytical  
8 procedures such as those provided by the National Environmental Laboratory Accreditation  
9 Conference (NELAC).

10  
11 The proposed EREF would ensure that the onsite laboratory and any contractor laboratory  
12 participate in third-party intercomparison programs such as the Mixed Analyte Performance  
13 Evaluation Program (MAPEP), U.S. Department of Energy (DOE) Quality Assurance Program  
14 (DOEQAP), and the Analytics Inc. Environmental Radiochemistry Cross-Check Program. The  
15 proposed EREF would require that all radiological vendors are certified by the National  
16 Environmental Laboratory Accreditation Program (NELAP) or an equivalent State laboratory  
17 accreditation agency for the analytes being tested.

### 18 19 **6.1.9 Reporting**

20  
21 As required by 10 CFR 70.59, the proposed EREF would submit a semiannual summary report  
22 of the environmental sampling program to the NRC with all associated data. The report would  
23 include:

- 24 • types of samples obtained
- 25
- 26 • quantities of samples
- 27
- 28 • frequency of environmental measurements
- 29
- 30 • radionuclide identities of facility-related radionuclides
- 31
- 32 • radionuclide activity concentrations of facility-related radionuclides obtained from
- 33 environmental sample
- 34
- 35

36 Also, the semiannual report would publish the minimal detectable concentrations for the  
37 analyses and the error associated with each measurement. Significant positive trends in activity  
38 concentrations would be presented in the report as well as potential adjustments to the  
39 sampling program, unavailable samples, and deviations to the sampling program.

### 40 41 **6.2 Nonradiological Measurements and Monitoring Program**

42  
43 Monitoring and measurement of nonradiological effluents would be conducted under the  
44 proposed facility's Physiochemical Monitoring Program to verify the effectiveness of effluent  
45 control measures. Nonradiological monitoring encompasses physiochemical measurements in  
46 general, as well as a number of specific monitoring programs. Physiochemical monitoring  
47 would routinely sample chemical contaminants in effluent streams and environmental media.

1 Specific monitoring programs would address liquid effluents, stormwater, environmental media,  
2 meteorology, and biota. These topics are summarized in the following sections.

### 3 4 **6.2.1 Physiochemical Monitoring**

5  
6 A physiochemical monitoring program would be conducted during the operation of the proposed  
7 EREF as part of an environmental protection program to control chemical and other  
8 nonradiological emissions and effluent discharges from the proposed facility. This monitoring  
9 program would confirm that effluent controls are working properly and would alert operators  
10 when they are not, so that corrective measures can be taken. Controls for gaseous and liquid  
11 effluents that would be in place in the proposed facility are discussed in Sections 4.2.4 and  
12 4.2.6, respectively.

13  
14 Physiochemical monitoring would be conducted by sampling stormwater, soil, sediment, surface  
15 water (if present in intermittent drainages), vegetation, and groundwater as defined in Table 6-4.  
16 Sampling locations are shown in Figure 6-2. Physiochemical monitoring would include effluent  
17 streams directly, as well as potentially affected environmental media, including soil, sediments,  
18 groundwater, surface water, and biota. Specific parameters monitored would include heavy  
19 metals, industrial organic compounds, and pesticides. Water effluents would also be sampled  
20 for fluoride, while gaseous effluents would be also sampled for HF as the fluoride ion.  
21 Additional chemicals may also be monitored, as required by permits, regulations, or other  
22 requirements.

23  
24 Sampling would be conducted on a routine basis, such as monthly or quarterly, while provisions  
25 would be in place to respond to emergency situations, accidents, or increased emission levels  
26 found in routine sampling. Sampling frequency and locations would be determined by the  
27 proposed EREF environmental staff in accordance with any permit requirements, such as an  
28 NPDES permit for industrial stormwater (Section 6.2.1.2), to demonstrate compliance. All liquid,  
29 solid, and gaseous wastes from enrichment-related processes and decontamination operations  
30 would be analyzed for chemical and radiological properties to determine appropriate disposal  
31 methods or treatment requirements (AES, 2010a). In the event of any accidental release from  
32 the proposed EREF, sampling protocols would be initiated immediately and on a continuing  
33 basis to document the extent and impact of the release until conditions are abated and mitigated  
34 (AES, 2010a).

35  
36 Effluent compliance levels would be set primarily in the respective permits issued and  
37 administered by U.S. Environmental Protection Agency (EPA) Region 10 and the Idaho  
38 Department of Environmental Quality (IDEQ), namely the NPDES permits issued under  
39 provisions of the *Clean Water Act*. In order to ensure meeting these levels, administrative  
40 action levels set below permitted levels would be established for all measured parameters prior  
41 to starting operations. Response actions for elevated measurements would be set at three  
42 levels of priority: (1) sample value exceeds three times normal background level, (2) sample  
43 value exceeds any administrative action level, and (3) sample value exceeds any regulatory  
44 limit. Appropriate response actions would be conducted accordingly, ranging from increasing  
45 monitoring frequency to performing corrective actions to prevent exceeding regulatory  
46 compliance levels.



**Table 6-4 Physiochemical Sampling and Analysis Program**

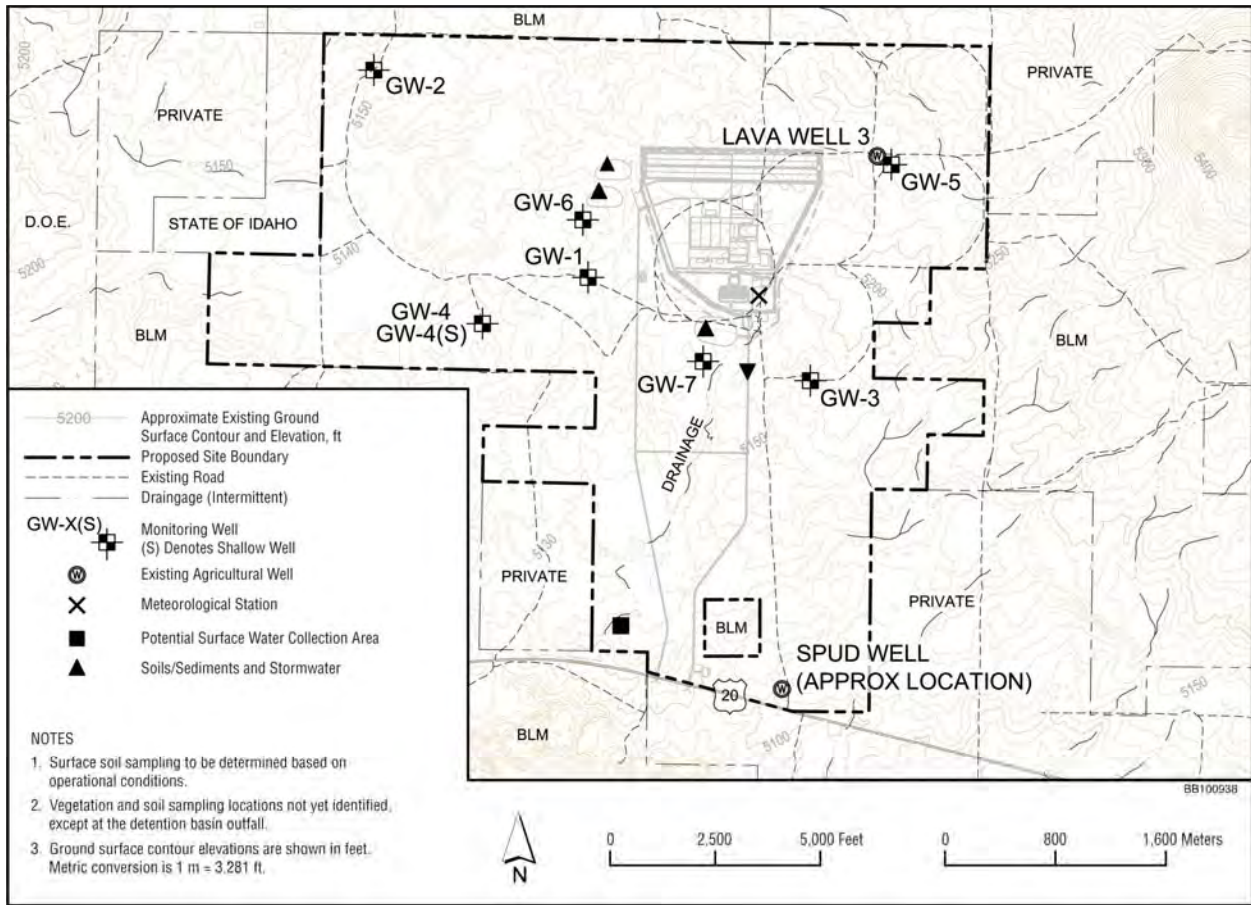
Media	Number of Locations	Monitoring Frequency	Sample Type	Monitored Parameters <sup>a</sup>
Groundwater	Nine deep wells and one shallow well (for baseline monitoring)	Semiannually for deep wells and for shallow wells when water is present	Grab	Metals, organics, and pesticides; water level elevations
Soil/sediment	Three minimum soil samples at location to be determined; 1 soil/sediment sample at the detention basin outfall	Quarterly near vegetation sample locations; one sample at each location	Surface grab	Metals, organics, pesticides, and fluoride uptake
	Retention and detention basin sediments at discharge points to the basins	Quarterly; one sample at each location	Surface grab	Metals, organics, pesticides, and fluoride uptake
Surface water	Potential location in intermittent drainages on southwestern corner of proposed property	Quarterly, if water is present	Grab	Metals, organics, and pesticides
Stormwater	Retention and detention basins at locations to be determined	Quarterly, if water is present	Grab	See Table 6-5
Vegetation <sup>b</sup>	Four minimum	Quarterly, if present (i.e., during growing seasons); one sample at each location	Surface grab	Fluoride uptake
Meteorology	One onsite station augmented by records from nearby meteorological stations	Daily	Continuous	Wind direction and speed, temperature, and humidity

<sup>a</sup> Analyses would meet EPA lower limits of detection, as applicable, and would be based on the baseline surveys and the type of matrix (sample type).

<sup>b</sup> Location to be established by AES's Environmental, Health, Safety, and Licensing staff.

Source: AES, 2010a.

1  
2 Samples would be analyzed mainly in an onsite laboratory in the Technical Services Building  
3 using methods and instrumentation specified in permits or otherwise meeting measurement  
4 quality and performance requirements. A laboratory quality control and quality assurance  
5 program would be implemented that would include written calibration and analysis procedures,  
6 use of laboratory quality control samples, and comparison studies with certified third-party  
7 laboratories. Some specialty analytical services, such as bioassays, may be contracted to an  
8 offsite laboratory as the need arises.  
9



**Figure 6-2 Proposed Physiochemical Monitoring Locations (AES, 2010a)**

During implementation of the monitoring program, some samples could be collected in a different manner than what is specified in Table 6-4. Reasons for these deviations could include severe weather events, changes in the length of the growing season, and changes in the amount of vegetation present. Under these circumstances, documentation would be prepared to describe how the samples were collected and the rationale for any deviations from normal monitoring program methods. If a sampling location has frequent unavailable samples or deviations from the schedule, then another location could be selected or other appropriate actions taken. Each year, the AES would submit a summary of the environmental program and associated data to the IDEQ and/or EPA Region 10, as required under its NPDES permits issued under IDAPA 58.01.16 and 40 CFR Part 122, respectively. This summary would include the types, numbers, and frequencies of samples collected (AES, 2010a).

The Potential to Emit (PTE) criteria and hazardous air pollutants of each of the proposed EREF's stationary emission sources would be inconsequential with respect to impacts on ambient air quality, and no operating permits are expected to be necessary for those emission sources that would require monitoring for ambient air quality impacts. Official ambient air quality monitoring stations in Idaho Falls operated by the IDEQ would continue to operate. Given the expected minimal impact on ambient air quality from proposed EREF operations and the current attainment status of the area with respect to all NAAQS, no additional ambient air quality

1 monitoring specific to proposed EREF operations and release of nonradioactive pollutants  
2 would be warranted during routine facility operation.

3  
4 During preconstruction and construction, AES would establish and operate particulate  
5 monitoring stations at locations along the north, south, and east proposed boundaries. These  
6 locations would continue in use during proposed EREF operation to monitor for airborne  
7 radioactive particulates (see Figure 6-1). AES would also review particulate monitoring data  
8 from the State-run monitoring station 20 miles to the east in Idaho Falls to identify impacts from  
9 preconstruction and construction activities at the proposed EREF. No releases of hazardous air  
10 pollutants (HAPs) related to construction have been projected by AES. Based on AES's  
11 description of the preconstruction and construction activities, NRC staff concurs that no HAPs  
12 would be released. Consequently, no monitoring programs have been suggested and the staff  
13 believes that no HAP monitoring during these phases is necessary.

#### 14 15 **6.2.1.1 Liquid Effluent Monitoring**

16  
17 Liquid effluent monitoring would be conducted at various locations throughout the proposed  
18 EREF to characterize potential releases other than those associated with wastewater discharge,  
19 which are covered in the radiological monitoring program (Section 6.1.3). Liquid effluent  
20 monitoring would involve both liquid (groundwater, surface water, and stormwater) and solid  
21 (soil or basin sediment) media (Table 6-4). Grab samples would be collected on a semiannual  
22 (groundwater) and quarterly (soil/sediment, surface water, and stormwater) basis and analyzed  
23 for metals, organics, and pesticides (and fluoride uptake in the case of soils and sediments).  
24 For groundwater, water level elevations would also be recorded for both deep wells and shallow  
25 wells (if water is present). Treated sanitary effluents would be sampled for isotopic analysis  
26 prior to being discharged to the retention basins (see Section 6.1.3; Table 6-3). Because  
27 treated sanitary wastewater discharges to the stormwater retention basins, nonradiological  
28 liquid effluent monitoring for sanitary discharge falls under the nonradiological (physiochemical)  
29 stormwater monitoring presented in Tables 6-4 and 6-5 and described in Section 6.2.1.2.

#### 30 31 **6.2.1.2 Stormwater Monitoring**

32  
33 A stormwater monitoring program would be initiated during preconstruction and construction of  
34 the proposed EREF. Data collected as part of the monitoring program would be used to  
35 evaluate the effectiveness of measures taken to prevent the contamination of stormwater and to  
36 retain sediments within property boundaries. A temporary detention basin would be used as a  
37 sediment control basin during preconstruction and construction as part of the proposed facility's  
38 overall sedimentation erosion control plan.

39  
40 During operation of the proposed EREF, the water quality of stormwater discharge would be  
41 typical of runoff from building roofs and paved areas. Except for small amounts of oil and  
42 grease typically found in runoff from paved roadways and parking areas, the discharge would  
43 not be expected to contain contaminants. Stormwater monitoring would continue with the same  
44 frequency upon initiation of operation. During plant operation, samples would be collected from  
45 the two Cylinder Storage Pads Stormwater Retention Basins and the Site Stormwater Detention  
46 Basin (used as a temporary detention basin during preconstruction and construction) to  
47 demonstrate that runoff would not contain any contaminants. Table 6-5 lists the parameters that  
48 would be monitored and their monitoring frequencies. The stormwater monitoring program

**Table 6-5 Stormwater Monitoring Program for Detention and Retention Basins<sup>a</sup>**

Monitored Parameter	Monitoring Frequency	Sample Type	LLD <sup>b</sup>
Oil and grease	Quarterly, if standing water exists	Grab	0.5 ppm
Total suspended solids	Quarterly, if standing water exists	Grab	0.5 ppm
Five-day biological oxygen demand	Quarterly, if standing water exists	Grab	2 ppm
Chemical oxygen demand	Quarterly, if standing water exists	Grab	1 ppm
Total phosphorus	Quarterly, if standing water exists	Grab	0.1 ppm
Total kjeldahl nitrogen	Quarterly, if standing water exists	Grab	0.1 ppm
pH	Quarterly, if standing water exists	Grab	0.01
Nitrate plus nitrite nitrogen	Quarterly, if standing water exists	Grab	0.2 ppm
Metals	Quarterly, if standing water exists	Grab	Varies by metal

<sup>a</sup> Site Stormwater Detention Basin, Cylinder Storage Pads Stormwater Retention Basins, and any temporary basin(s) used during preconstruction and construction.

<sup>b</sup> LLD = lower limit of detection; analyses would meet EPA LLDs, as applicable, and would be based on the baseline surveys and the type of matrix (sample type).

Source: AES, 2010a.

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2  
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28

would be refined to reflect the requirements of the NPDES Construction General Discharge Permit and the General Permit for Industrial Stormwater that AES would obtain from the EPA Region 10 (AES, 2010a).

**6.2.1.3 Environmental Monitoring**

An environmental surveillance sampling program would be implemented with the objective of detecting and monitoring any discernible and relevant effects of plant operations on the surrounding environment so that appropriate actions could be taken to mitigate effects if necessary. As noted above, the chemical constituents analyzed would be in accordance with permits and could include other process or site-related chemicals of interest. Soils, sediments, surface water, groundwater, and biota would be sampled in areas potentially impacted by process effluents or runoff from the proposed facility. Sampling would be conducted both onsite and offsite.

Sampling locations would be selected based on wind patterns, surface runoff patterns, and at, or down-gradient of, discrete discharge points, including the outfall at the Stormwater Detention Basin. Groundwater samples would be collected from a series of wells installed around the facility, as shown in Figure 6-2. Stormwater would be sampled from the Cylinder Storage Pads Stormwater Retention Basins and from the intermittent stream drainage at the southwest corner of the proposed property.

Vegetation sampling would include grasses and locally grown vegetable crops. Soils would be sampled at the same locations as vegetation, including at the outlet at the Stormwater Detention Basin described in Section 4.2.6. Sediment samples would be collected at the discharge points of the various collection basins that would exist onsite (AES, 2010a).



1 **6.2.1.4 Meteorological Monitoring**  
2

3 Meteorological parameters of wind speed and direction, air temperature, and humidity would be  
4 continuously monitored at an onsite meteorological tower. Instruments would be located on the  
5 tower at an elevation of 40 meters (132 feet). The tower would be located such that the  
6 instruments would be at the same approximate elevation as effluent emission points and would  
7 be sufficiently distant from buildings and other structures so as not to be influenced by  
8 turbulence caused by those structures. The exact location of the meteorological tower has been  
9 withheld as security-related information. A “clear area” would be maintained for a distance of at  
10 least ten times the height of obstructions located within the prevailing wind directions from the  
11 tower. Quality control programs would use formalized procedures to provide for instrument  
12 calibrations, preventative maintenance and corrective actions, and redundant data capture and  
13 storage such that a data recovery rate of at least 90 percent would be maintained over time.  
14 Real-time meteorological data would be displayed in the Control Room where instrument  
15 malfunctions could be quickly identified and addressed. Real-time data would available for use  
16 in dispersion modeling for both routine and nonroutine (accident) conditions.  
17

18 **6.2.1.5 Local Flora and Fauna**  
19

20 The physiochemical monitoring program would include quarterly sampling of grasses and locally  
21 grown vegetable crops, which would be analyzed for fluoride uptake (Table 6-4). Sampling  
22 locations would be established by AES’s Environmental, Health, Safety, and Licensing staff. |  
23 Section 6.2.2 provides a discussion of the monitoring of impacts to biotic communities.  
24

25 **6.2.1.6 Quality Assurance**  
26

27 The onsite analytical laboratory would implement a formal quality assurance/quality control  
28 program to monitor, assess, control, and report to the appropriate agencies the performance of  
29 chemical analyses so that they meet required performance standards specified in permits or  
30 within the standard procedures employed. Generally recognized good laboratory practices  
31 would be employed in all aspects of the analysis. The quality assurance program for  
32 nonradiological analyses would employ similar quality assurance principles as that for  
33 radiological analyses presented in Sections 6.1.8 and 6.1.9. Radiological and nonradiological  
34 programs have traditionally been administered separately at the laboratory level, owing to  
35 technical differences, laboratory access controls, analyst training, and to separate guidance  
36 from different Federal agencies providing technical oversight. Quality assurance programs for  
37 the two technical areas at the proposed EREF would be administered within a single  
38 overarching sampling and analysis organization. Different third-party laboratories would be  
39 involved in separate quality assurance measurement programs involving external parties.  
40

41 The quality assurance program for both radiological and nonradiological measurements would  
42 be headed by a qualified quality assurance officer and would employ formal written procedures  
43 for all phases of method performance, from sample collection through data management and  
44 reporting. Recognized standard methods would be used that are known to produce results of  
45 the required quality. Chain-of-custody procedures would be followed during handling and  
46 transfer of samples and results. Both field samples and laboratory quality control samples  
47 would be analyzed, including appropriate blank, duplicate, and spiked samples, as well as  
48 laboratory calibration and sample recovery standards. Performance standards would be set to



1 meet the requirements of the measurement program, and would include standards for lower  
2 limits of detection, sample recovery, and reproducibility of analysis.

3  
4 Employed outside contract laboratories would have relevant EPA and Idaho certifications. Such  
5 laboratories would likewise follow a formal quality assurance program, including participation in  
6 third-party comparison studies, and would employ methods approved by the proposed EREF's  
7 laboratory quality assurance officer.

## 8 9 **6.2.2 Ecological Monitoring**

10  
11 The ecological monitoring program would characterize changes that may occur in the  
12 composition of biotic communities as a result of preconstruction, construction, and operation of  
13 the proposed EREF.

14  
15 The program would focus on observable changes in habitat characteristics and wildlife  
16 populations.

17  
18 The ecological monitoring program would be carried out in accordance with generally accepted  
19 monitoring practices and the requirements of the Idaho Department of Fish and Game and the  
20 U.S. Fish and Wildlife Service. Under the program, data would be collected, recorded, stored,  
21 and analyzed. Procedures would be established, as appropriate, for data collection, storage,  
22 analysis, reporting, and corrective actions. Actions would be taken as necessary to reconcile  
23 anomalous results (AES, 2010a).

### 24 25 **6.2.2.1 Monitoring Program Elements**

26  
27 The elements that would be included in the ecological monitoring program are vegetation, birds,  
28 mammals, and herpetiles (reptiles and amphibians). There are currently no action levels or  
29 reporting levels for any of these elements. However, consultations would continue with all  
30 appropriate agencies, such as the U.S. Fish and Wildlife Service, Bureau of Land Management,  
31 and Idaho Department of Fish and Game. Agency recommendations, based on future  
32 consultations and reviews of monitoring program data, would be considered in the development  
33 of action levels and/or reporting levels for each element (AES, 2010a).

34  
35 In addition, to reduce potential impacts on birds and other wildlife, AES would periodically  
36 monitor the proposed site during the preconstruction, facility construction, and operation  
37 phases, including sampling of detention-basin and retention-basin waters. Measures would be  
38 taken to release any entrapped wildlife. The monitoring program would include an assessment  
39 of the effectiveness of entry barriers and release features (AES, 2010a). In addition, for the first  
40 five years following the completion of the new transmission line, AES would conduct annual  
41 surveys of the transmission line route for avian mortalities, including sage-grouse, due to  
42 collision or electrocution (AES, 2010b). These surveys would consist of in-vehicle observations  
43 while driving along the transmission line right-of-way. Remedial measures, such as high-visibility  
44 line markers, would be considered if surveys indicate the need. If perching of raptors or corvids  
45 that would imperil sage-grouse populations is discovered, remedial measures, such as anti-  
46 perching devices, would be considered.

1 **6.2.2.2 Observations and Monitoring Program Design**  
2

3 The overall monitoring program would include preconstruction, construction, and operations  
4 monitoring programs. The preconstruction monitoring program would be conducted prior to the  
5 initiation of construction activities and would establish the baseline ecological conditions on the  
6 proposed EREF property. The monitoring procedures used to characterize the vegetation, bird,  
7 mammal, and herpetile communities during preconstruction monitoring would also be used for  
8 the construction and operations monitoring programs (AES, 2010a).  
9

10 Surveys for the construction and operations monitoring program would use the same monitoring  
11 locations established for the preconstruction monitoring program. These surveys are designed  
12 to detect broad changes in the composition of the biotic communities that may be associated  
13 with the construction and operation of the proposed EREF. Changes resulting from natural  
14 succession processes would be considered in the interpretation of the results of the construction  
15 and operations monitoring program, because it is expected that plant communities on the  
16 proposed property would undergo successional changes, even in the absence of the proposed  
17 EREF project, with concomitant changes in the bird, mammal, and herpetile communities  
18 (AES, 2010a).  
19

20 No specific monitoring equipment would be needed for the ecological monitoring, due to the  
21 type of monitoring proposed for the program as described above (AES, 2010a). Data collected  
22 for the ecological monitoring program would be recorded on paper and/or electronic forms.  
23 These data would be kept on file for the life of the proposed facility (AES, 2010a).  
24

25 The monitoring program analyses would include descriptive statistics that would include the  
26 mean, standard deviation, standard error, and confidence interval for the mean. For each study,  
27 the sample size would be indicated. These standard descriptive statistics would be used to  
28 assess sample variability. For these studies, a significance level of 5 percent would be used,  
29 resulting in a 95 percent confidence level (AES, 2010a).  
30

31 The data collected for the ecological monitoring program would be analyzed by the  
32 Environment, Health, and Safety Manager or a staff member reporting to the manager.  
33 A summary report would be prepared and would include spatial and temporal information  
34 regarding species composition and distribution and the relative abundance of key species  
35 (AES, 2010a).  
36

37 **Vegetation**  
38

39 Monitoring plant communities would include estimates of ground cover at about 20 permanent  
40 monitoring locations. The establishment of permanent monitoring locations would allow for the  
41 long-term evaluation of vegetation trends and characteristics of the proposed EREF property.  
42 Monitoring would be conducted annually in June, coinciding with the flowering period of the  
43 dominant perennial species. The selected monitoring locations would be positioned within the  
44 proposed EREF property, outside the proposed facility footprint. Global Positioning System  
45 coordinates would be recorded and used to identify and relocate the monitoring points  
46 (AES, 2010a). Figure 6-3 shows the positions of the monitoring locations.  
47

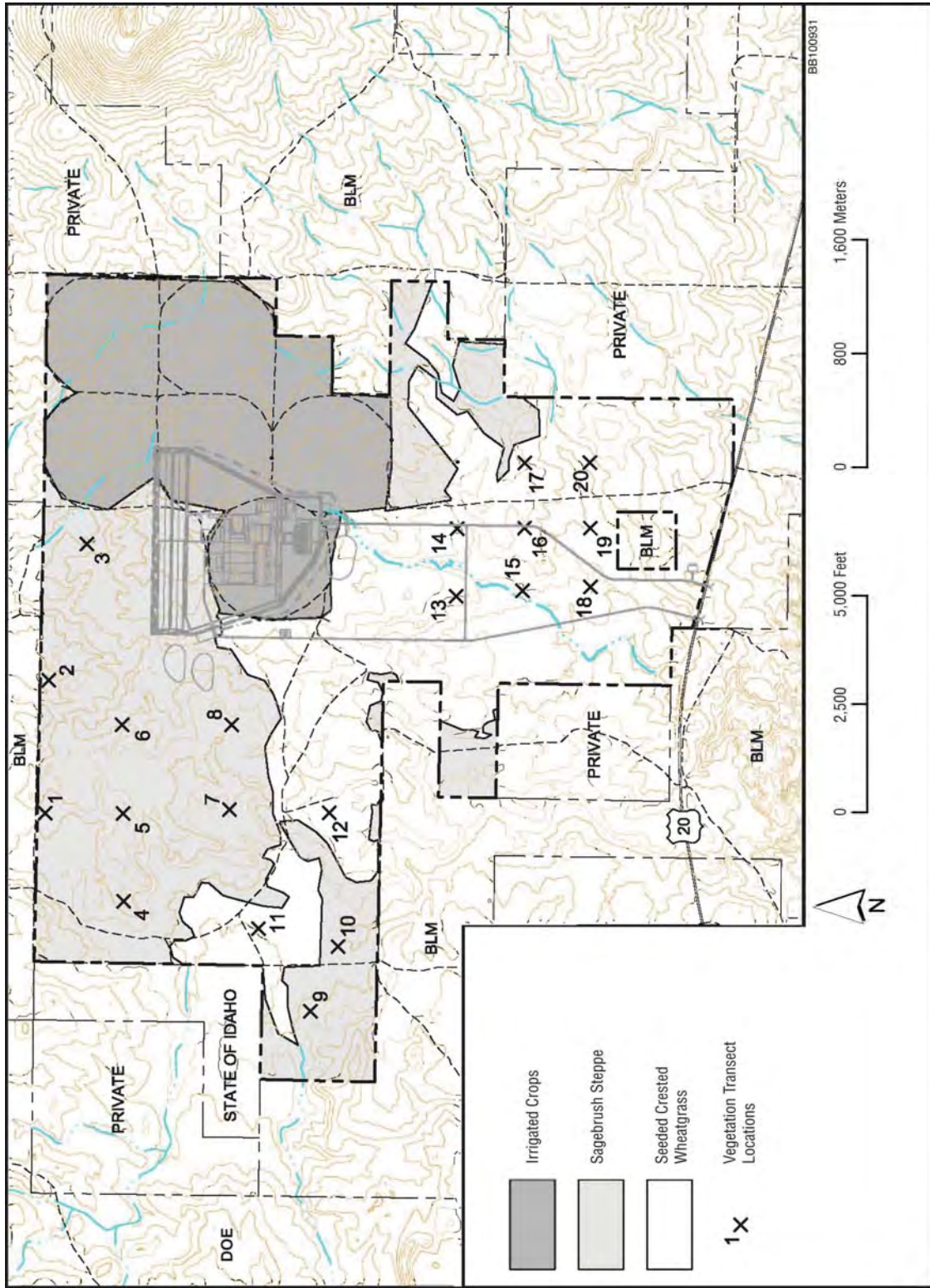


Figure 6-3 Vegetation Sampling Locations (AES, 2010a)

1 Using the point-transect method, monitoring data would be collected from the sagebrush steppe  
2 and disturbed sagebrush steppe habitats. Two 50-meter (164-foot) transect lines would extend  
3 from a randomly selected point at each monitoring location, one transect oriented to the east  
4 and the other to the south. Observation data would be collected at points located at intervals  
5 along the transect lines. Ground surface data (e.g., bare soil, leaf litter) on overstory and  
6 understory species that are intersected by the data points would be recorded. Data analysis  
7 would determine species composition and ground surface characteristics. In addition to  
8 preconstruction and construction monitoring, operations monitoring would initially be conducted  
9 through at least the first 3 years of plant operation. Subsequently, changes to the monitoring  
10 program may be initiated based on operational experience (AES, 2010a).

### 11 Wildlife

12 Wildlife monitoring surveys would be conducted to record the presence of mammals, birds, and  
13 herpetiles in the vicinity of the proposed EREF site. Wildlife monitoring would be designed to  
14 identify species and provide estimates of abundance. The surveys would be conducted  
15 annually in late spring/early summer and late fall/early winter. Data recorded each sampling  
16 day would include weather conditions (e.g., temperature, wind speed and direction, humidity,  
17 cloud cover). Changes in weather conditions during sampling would also be recorded. No  
18 surveys would be conducted when weather conditions (e.g., rain, heavy snow, high winds)  
19 reduce the likelihood of wildlife observations due to reduced animal activity or reduced visibility  
20 (AES, 2010a).

21 Permanent parallel transects, 1.6 kilometers (1.0 mile) in length and separated by 0.4 to  
22 0.8 kilometers (0.25 to 0.50 miles), would be located in the sagebrush steppe and disturbed  
23 sagebrush steppe habitats. Transects would be walked from 30 minutes before sunrise to  
24 1.5 hours after sunrise and 1.5 hours before sunset to 30 minutes after sunset. Data collected  
25 would include visual observations of animals, signs (e.g., tracks, droppings, feathers, nests,  
26 burrows), and calls. Species composition and relative abundance would be determined.  
27 Gender and age (e.g., juvenile, adult) would be recorded when possible. Data would also  
28 include behavior (flight, singing, territory establishment, nesting, perching). In addition to  
29 preconstruction and construction monitoring, operations monitoring would initially be conducted  
30 through at least the first 3 years of plant operation. Subsequently, changes to the monitoring  
31 program may be initiated based on operational experience (AES, 2010a).

### 32 Birds

33 Surveys of bird populations would be conducted twice each year, in late spring during breeding,  
34 nesting, and brood rearing seasons, and also during the winter. Recorded data would include  
35 species and numbers of individuals observed, as well as behavior. Data would be compared to  
36 information regarding birds listed in Table 6-6 as potentially using the proposed EREF property  
37 (AES, 2010a).

### 38 Mammals

39 Surveys of mammal populations would be conducted twice each year, in late spring during  
40 breeding and nursing season and during late fall/winter during migration and movements to  
41 winter range. Recorded data would include species and numbers of individuals observed, as  
42



**Table 6-6 Birds Potentially Using the Proposed EREF Property**

Common Name	Scientific Name	Summer Breeder	Wintering	Resident	Migrant
Turkey vulture	<i>Cathartes aura</i>	U <sup>a</sup>	U	- <sup>a</sup>	A <sup>a</sup>
Osprey	<i>Pandion haliaetus</i>	-	-	-	R <sup>a</sup>
Bald eagle	<i>Haliaeetus leucocephalus</i>	-	U	-	R
Northern harrier	<i>Circus cyaneus</i>	-	-	C <sup>a</sup>	-
Sharp-shinned hawk	<i>Accipiter striatus</i>	R	R	-	R
Cooper's hawk	<i>Accipiter cooperii</i>	U	R	-	R
Swainson's hawk	<i>Buteo swainsoni</i>	U	R	-	U
Red-tailed hawk	<i>Buteo jamaicensis</i>	U	R	-	R
Ferruginous hawk	<i>Buteo regalis</i>	U	R	-	R
Rough-legged hawk	<i>Buteo regalis</i>	C	A	-	C
Golden eagle	<i>Aquila chrysaetos</i>	U	C	-	U
American kestrel	<i>Falco sparverius</i>	C	U	-	C
Merlin	<i>Falco columbarius</i>	-	-	R	-
Peregrine falcon	<i>Falco peregrinus</i>	-	-	R	-
Gyrfalcon	<i>Falco rusticolus</i>	-	-	-	A
Prairie falcon	<i>Falco mexicanus</i>	-	-	U	-
Chukar	<i>Alectoris chukar</i>	-	-	U	-
Greater sage-grouse	<i>Centrocercus urophasianus</i>	-	-	C	-
Kildeer	<i>Charadrius vociferus</i>	C	-	-	C
Long-billed curlew	<i>Numenius americanus</i>	U	-	-	U
Franklin's gull	<i>Larus pipixcan</i>	U	-	-	U
Ring-billed gull	<i>Larus delawarensis</i>	U	-	-	U
California gull	<i>Larus californicus</i>	R	-	-	U
Herring gull	<i>Larus argentatus</i>	U	-	-	U
Mourning dove	<i>Zenaida macroura</i>	C	R	-	C
Great horned owl	<i>Bubo virginianus</i>	-	-	U	-
Burrowing owl	<i>Athene cunicularia</i>	U	A	-	U
Short-eared owl	<i>Asio flammeus</i>	U	-	-	U
Northern sawwhet owl	<i>Aegolius acadicus</i>	-	A	-	A
Common nighthawk	<i>Chordeiles minor</i>	C	-	-	U
Horned lark	<i>Eremophila alpestris</i>	C	C	-	C
Black-billed magpie	<i>Pica pica</i>	-	-	C	-
American crow	<i>Corvus brachyrhynchos</i>	-	-	U	-



**Table 6-6 Birds Potentially Using the Proposed EREF Property (Cont.)**

Common Name	Scientific Name	Summer Breeder	Wintering	Resident	Migrant
Common raven	<i>Corvus corax</i>	-	-	U	-
Rock wren	<i>Salpinctes obsoletus</i>	U	-	-	U
Canyon wren	<i>Catherpes mexicanus</i>	R	-	-	R
House wren	<i>Troglodytes aedon</i>	U	U	-	U
Western bluebird	<i>Sialia mexicana</i>	U	-	-	U
American robin	<i>Turdus migratorius</i>	C	-	-	C
Sage thrasher	<i>Oreoscoptes montanus</i>	C	-	-	C
Northern shrike	<i>Lanius excubitor</i>	-	R	-	U
Loggerhead shrike	<i>Lanius ludovicianus</i>	-	-	U	-
European starling	<i>Sturnus vulgaris</i>	-	-	C	-
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>	R	-	-	R
Green-tailed towhee	<i>Pipilo chlorurus</i>	U	-	-	U
Rufous-sided towhee	<i>Pipilo erythrophthalmus</i>	U	-	-	U
Brewer's sparrow	<i>Spizella breweri</i>	C	-	-	C
Lark sparrow	<i>Chondestes grammacus</i>	U	-	-	R
Black-throated sparrow	<i>Amphispiza bilineata</i>	R	-	-	R
Sage sparrow	<i>Amphispiza belli</i>	C	-	-	C
Lark bunting	<i>Calamospiza melanocorys</i>	R	-	-	R
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	-	-	-	R
Vesper sparrow	<i>Pooecetes gramineus</i>	U	-	-	U
Chipping sparrow	<i>Spizella passerina</i>	-	-	-	R
Grasshopper sparrow	<i>Ammodramus savannarum</i>	U	-	-	U
Brown-headed cowbird	<i>Molothrus ater</i>	-	-	-	U
Snow bunting	<i>Plectrophenax nivalis</i>	-	R	-	R
Red-winged blackbird	<i>Agelaius phoeniceus</i>	U	-	-	U
Western meadowlark	<i>Sturnella neglecta</i>	C	U	-	C
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	C	R	-	C
Rosy finch	<i>Leucosticte arctoa</i>	-	R	-	R
House sparrow	<i>Passer domesticus</i>	C	U	-	C

<sup>a</sup> U = Species likely would be uncommon onsite if observed at all; C = Species likely would be common onsite; R = Species likely would be rare onsite if observed at all; A = Accidental occurrence; - = Not applicable.

Source: AES, 2010a.

1 well as behavior (e.g., fleeing, feeding, or resting). Data would be compared to information  
2 regarding mammals listed in Table 6-7 as potentially using the proposed EREF property  
3 (AES, 2010a).

#### 4 Herpetiles

5  
6  
7 Surveys of reptile and amphibian populations would be conducted once each year, during the  
8 summer when these species are most active. Recorded data would include species and  
9 numbers of individuals observed, as well as behavior (e.g., breeding, display, feeding, resting,  
10 or thermoregulating). Data would be compared to information regarding reptiles and  
11 amphibians listed in Table 6-8 as potentially using the proposed EREF property (AES, 2010a).

### 12 **6.3 References**

13  
14  
15 (AES, 2010a) AREVA Enrichment Services, LLC. "Eagle Rock Enrichment Facility  
16 Environmental Report, Rev. 2." Bethesda, Maryland. April.

17  
18 (AES, 2010b) AREVA Enrichment Services, LLC. Letter from J.A. Kay (Licensing Manager,  
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23 (NRC, 1979) U.S. Nuclear Regulatory Commission. "Quality Assurance for Radiological  
24 Monitoring Programs (Normal Operations) – Effluent Streams and the Environment."  
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29 and Fabrication Plants and Uranium Hexafluoride Production Plants." Regulatory Guide 4.16,  
30 Rev. 1. December.

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32 (NRC, 1991) U.S. Nuclear Regulatory Commission. "Offsite Dose Calculation Manual  
33 Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors." NUREG-1302.  
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35  
36 (X5 Monte Carlo Team, 2003) X5 Monte Carlo Team. "MCNP – A General Monte Carlo  
37 N-Particle Transport Code, Version 5." LA-UR-0301987. April 24.

**Table 6-7 Mammals Potentially Using the Proposed EREF Property**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Preferred Habitat</b>	<b>Probable Occurrence</b>
Little brown myotis	<i>Myotis lucifugus</i>	Coniferous forest, riparian areas in the mountains and lower valleys, woodlots, shelterbelts, and urban areas.	Unlikely to occur due to lack of suitable habitat.
Townsend's bigeared bat	<i>Plecotus townsendii</i>	Desert scrub, mixed conifer forest, and piñon-juniper habitat. Specifically associated with limestone caves, mines, lava tubes.	Unlikely to occur due to lack of suitable habitat.
White-tailed jack rabbit	<i>Lepus townsendii</i>	Found in open grasslands and montane shrublands generally above shrub steppe.	Probably occurs at the property in limited numbers due to lack of habitat.
Black-tailed jack rabbit	<i>Lepus californicus</i>	A habitat generalist, primarily found in arid regions supporting shortgrass habitats.	Likely occurs at the property.
Mountain cottontail	<i>Sylvilagus nattallii</i>	Brushy, rocky areas in dense sagebrush and streamside thickets and forest edges.	Likely occurs at the property.
Yellow-bellied marmot	<i>Marmota flaviventris</i>	Prefers montane meadows adjacent to talus slopes or rock outcrops; avoids tall vegetation.	Unlikely to occur due to lack of suitable habitat.
Pygmy rabbit	<i>Brachylagus idahoensis</i>	Big sagebrush habitat and secondarily in communities dominated by rabbitbrush.	Potentially occurs at the property.
Townsend's ground squirrel	<i>Spermophilus townsendii</i>	Arid environments with deep, friable, well-drained soils.	Likely occurs at the property.
Least chipmunk	<i>Eutamias minimus</i>	Sagebrush, bitterbrush, and other Great Basin shrub habitats.	Likely occurs at the property.
Northern pocket gopher	<i>Thomomys talpoides</i>	Mountain meadows, tundra, grasslands, sagebrush steppe, and agricultural fields – habitats lacking canopy cover but having abundant ground cover.	Probably occurs at the property in limited numbers due to lack of habitat.
Great basin pocket mouse	<i>Perognathus parvus</i>	Arid, sparsely vegetated plains and brushy areas.	Likely occurs at the property.
Ord's kangaroo rat	<i>Dipodomys ordii</i>	Semiarid, open habitats. Big sagebrush/crested wheatgrass range; disturbed sites.	Likely occurs at the property.
Beaver	<i>Castor canadensis</i>	Stable aquatic habitats providing adequate water, channel gradient of less than 15 percent, and quality food species.	Unlikely to occur due to lack of suitable habitat.

**Table 6-7 Mammals Potentially Using the Proposed EREF Property (Cont.)**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Preferred Habitat</b>	<b>Probable Occurrence</b>
Western harvest mouse	<i>Reithrodontomys megalotis</i>	Open areas, including grasslands, prairies, meadows, and arid areas including deserts, sand dunes, and shrublands.	Likely occurs at the property.
Deer mouse	<i>Peromyscus maniculatus</i>	Most common habitats are prairies, bushy areas, and woodlands.	Likely occurs at the property.
Coyote	<i>Canis latrans</i>	Extremely adaptable; uses a wide range of habitats, including forests, grasslands, deserts.	Likely occurs at the property.
Long-tailed weasel	<i>Mustela frenata</i>	Upland brush, grasslands and woods to subalpine rock slides and semi-open forest areas.	Probably occurs at the property in limited numbers due to lack of habitat.
Badger	<i>Taxidea taxus</i>	Occurs primarily in grasslands, shrublands, and other treeless areas with friable soil and a supply of rodent prey.	Likely occurs at the property.
Canada lynx	<i>Lynx canadensis</i>	Canada lynxes require early, mid- and late-successional forests.	Unlikely to occur due to lack of suitable habitat.
Bobcat	<i>Lynx rufus</i>	Adapted to a wide variety of habitats, including canyons, deserts, and mountain ranges. Bobcats are found in desert environments if shade is available.	Probably occurs at the property in limited numbers due to lack of habitat.
Elk	<i>Cervus elaphus</i>	Found mostly in mountain or foothill areas; prefer alpine meadows in summer and then move to lower, wooded slopes or sagebrush steppe in winter.	Likely occurs at the property.
Mule deer	<i>Odocoileus hemionus</i>	Coniferous forests, shrub steppe, chaparral, and grasslands, from dry, open country to dense forests. Prefer arid open areas and rocky hillsides.	Probably occurs at the property in limited numbers due to lack of habitat.
Pronghorn	<i>Antilocapra americana</i>	Open plains and semi-deserts; often found on low, rolling, expansive lands with less than 30 percent slope.	Likely occurs at the property.

Source: AES, 2010a.

**Table 6-8 Amphibians and Reptiles Potentially Using the Proposed EREF Property**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Preferred Habitat</b>	<b>Probable Occurrence</b>
Great Basin spadefoot toad	<i>Spea intermontana</i>	Sagebrush communities below 6,000 feet in elevation having loose soil in which to burrow. Breeding habitat is aquatic.	Unlikely to occur due to lack of aquatic habitat.
Long-nosed leopard lizard	<i>Gambelia wislizenii</i>	Arid and semi-arid plains with sagebrush, grass, and other low scattered vegetation. Prefers flat areas with open space for running, avoiding densely vegetated areas.	Probably occurs at the property in limited numbers due to lack of habitat.
Short-horned lizard	<i>Phrynosoma douglassi</i>	Open pine forests, piñon-juniper forests, shortgrass prairies, and sagebrush desert.	Likely occurs at the property.
Sagebrush lizard	<i>Sceloporus graciosus</i>	Sagebrush and other types of shrublands, in open areas with scattered low bushes and lots of sun.	Likely occurs at the property.
Western skink	<i>Eumeces skiltonianus</i>	Piñon-juniper forests, grassy areas, desert shrub, talus slopes, and canyon rims; often found in areas associated with water.	Unlikely to occur due to lack of suitable habitat.
Rubber boa	<i>Charina bottae</i>	Desert shrub to open pine forest. Often near water and near rocks, woody debris, or leaf litter that are used for cover.	Unlikely to occur due to lack of suitable habitat.
Desert striped whipsnake	<i>Masticophis taeniatus</i>	Occurs in open brushy country-desert scrub, sagebrush flats, and mixed woodlands. Often found along the edges of rivers or ponds.	Probably occurs at the property in limited numbers due to lack of habitat.
Gopher snake	<i>Pituophis catenifer</i>	Grassland, sagebrush, agricultural lands, riparian areas, woodlands, desert.	Likely occurs at the property.
Western terrestrial garter snake	<i>Thamnophis elegans</i>	Found statewide in habitats ranging from desert riparian areas to mountain lakes and meadows.	Probably occurs at the property in limited numbers due to lack of habitat.
Western rattlesnake	<i>Crotalus viridis</i>	Drier regions with sparse vegetation, usually with a rocky component.	Likely occurs at the property.

Source: AES, 2010a.





## 7 BENEFIT-COST ANALYSIS

1  
2  
3 A benefit-cost analysis can provide a rationale for deciding whether a project is likely to have a  
4 net positive economic impact, by aggregating each of the costs and benefits resulting from the  
5 project. A benefit-cost analysis involves valuing the benefits and costs associated with projects  
6 in monetary terms, to the extent possible. Depending on the extent of the data available,  
7 benefit-cost analyses may rely entirely or partially on qualitative data to assess the various costs  
8 and benefits, with the methodology employed for a benefit-cost analysis usually being  
9 dependent on the specific issues involved in a project. Costs and benefits are often separated  
10 into two categories, private and societal. Private costs and benefits are those that impact the  
11 owner of a project or facility, in this case AREVA Environmental Services, LLC (AES), while  
12 societal costs and benefits are those that impact society as a whole. Much of the data  
13 associated with preconstruction, construction, and operation of the proposed Eagle Rock  
14 Enrichment Facility (EREF) in Bonneville County, Idaho, that would be used to assess the  
15 private costs of the proposed EREF, the costs of constructing and operating the facility, are  
16 proprietary commercial information, withheld in accordance with Title 10, "Energy," of the  
17 U.S. *Code of Federal Regulations* (10 CFR 2.390). These costs are presented in a proprietary  
18 appendix to this Environmental Impact Statement (EIS), Appendix H, and are not discussed in  
19 this chapter. As such, Appendix H is not included in the publicly available version of this EIS.  
20 Additional data associated with operation of the facility, regarding annual revenues from the sale  
21 of enriched uranium, was not available, meaning that no estimate of the private benefits of the  
22 facility can be made.

23  
24 As a result of the lack of data that can be publicly disclosed or is otherwise available, the  
25 analysis in this chapter focuses on the various societal costs and benefits associated with  
26 preconstruction, the proposed action, and the no-action alternative using data provided by AES  
27 in its license application and Environmental Report (AES, 2010a). These data include the  
28 economic and fiscal benefits of preconstruction, facility construction, and operation to the region  
29 of influence (ROI) (defined in Section 7.1) in which the plant would be located, and to the Idaho  
30 State economy. Also discussed are the benefits of the plant in fulfilling the need for enriched  
31 uranium to meet domestic electricity requirements, for domestic supplies of enriched uranium  
32 for national energy security, and for upgraded uranium enrichment technology in the  
33 United States for energy generation with fewer emissions of criteria pollutants and carbon.  
34 Societal costs considered include those related to impacts on land use, historical and cultural  
35 resources, visual and scenic resources, air quality, geology and soil, water resources, ecological  
36 resources, environmental justice, noise, transportation, public and occupational health, waste  
37 management, and accidents.

38  
39 The chapter compares the societal benefits and costs both quantitatively, in monetary terms  
40 where possible, and qualitatively. Section 7.1 weighs the costs and benefits associated with  
41 preconstruction and the proposed action. Section 7.2 then compares the costs and benefits for  
42 preconstruction and the proposed action relative to those of the no-action alternative.  
43 Section 7.3 combines these two sections in forming overall conclusions. Alternatives that have  
44 previously been ruled out for failing to meet the proposed project's technical and policy  
45 objectives are described in Section 2.2.4 and are not revisited in this chapter.  
46

1 **7.1 Costs and Benefits of Preconstruction and the Proposed Action**  
2

3 The proposed action is for AES to construct, operate, and decommission a gas centrifuge  
4 uranium enrichment facility in Bonneville County, Idaho. To allow the proposed action to take  
5 place, the NRC would issue a license for AES under the provisions of the *Atomic Energy Act*.  
6 The license would authorize AES to possess and use special nuclear material, source material,  
7 and byproduct material at the proposed EREF for a period of 30 years, in accordance with the  
8 NRC's regulations in 10 CFR Parts 70, 40, and 30, respectively. The proposed EREF would be  
9 constructed over an eleven-year period. Enrichment operations would begin in 2014, continuing  
10 until 2041, when production would gradually decrease as decommissioning begins.  
11

12 As discussed in Section 3.12 of this EIS, the principal socioeconomic benefit of the proposed  
13 EREF would be an increase in employment and income in the ROI, defined as the 11-county  
14 area in which workers at the proposed facility would live and spend their wages and salaries.  
15 Although the majority of the costs, and most of the socioeconomic impacts, of the various  
16 phases of development of the proposed EREF would occur in the 11-county ROI, the majority of  
17 the economic and fiscal benefits would occur in a 2-county ROI consisting of Bingham and  
18 Bonneville Counties. The uranium enrichment technology and energy security benefits of the  
19 facility would occur at the national level.  
20

21 This section describes the costs and benefits of construction and operation of the proposed  
22 EREF and those associated with preconstruction. Quantitative estimates (in terms of dollars)  
23 are provided where possible. Other costs and benefits are described in qualitative terms.  
24

25 **7.1.1 Costs of Preconstruction and the Proposed Action**  
26

27 The direct costs associated with the proposed action may be categorized by the following life-  
28 cycle stages:  
29

- 30 • facility construction
- 31
- 32 • facility operation
- 33
- 34 • depleted uranium disposal
- 35
- 36 • decommissioning  
37

38 In addition to the costs of the proposed action, costs would be incurred for preconstruction  
39 under both the proposed action and the no-action alternative.  
40

41 As the monetary costs associated with the preconstruction, construction, and operations phases  
42 of the proposed EREF are withheld under the provisions of 10 CFR 2.390, the costs associated  
43 with each of these life-cycle stage are discussed and summarized in a proprietary appendix,  
44 Appendix H, and summarized in Table H-1. As decommissioning activities for the proposed  
45 EREF are anticipated to occur more than 20 years in the future, costs associated with this  
46 phase of the proposed action cannot be estimated with any certainty at this time. It is expected,  
47 however, that annual decommissioning costs would be less than the annual costs of operating  
48 the facility.  
49

1 In addition to monetary costs, preconstruction and the proposed action would result in impacts  
2 on various resource areas, which are considered “costs” for the purpose of this analysis. The  
3 resource areas and corresponding impacts are summarized below and described in more detail  
4 in Chapter 4 of this EIS. As summarized below, the impacts of preconstruction and the  
5 proposed action on the various resource areas would be mostly SMALL, with MODERATE  
6 impacts in a few cases. Any LARGE impacts would generally be very temporary and  
7 intermittent in nature, or would be reduced to MODERATE with the appropriate mitigation  
8 measures.

- 9
- 10 • *Land Use.* As described in Section 4.2.1, the proposed EREF would be located entirely on  
11 private land. The operation of a uranium enrichment facility is consistent with the county’s  
12 zoning. Current agricultural uses of the proposed EREF property would be curtailed, but  
13 similar activities would continue over large land areas surrounding the proposed EREF  
14 property and vicinity. For example, it is not anticipated that preconstruction, construction,  
15 and operation of the proposed EREF would have any effect on current land uses found on  
16 the surrounding Federal lands administered by the U.S. Bureau of Land Management. Land  
17 use impacts resulting from preconstruction, construction, and operation would be SMALL.  
18
- 19 • *Historic and Cultural Resources.* As described in Section 4.2.2, there are 13 cultural  
20 resource sites in the immediate vicinity of the proposed EREF. Only one of these sites is  
21 eligible for listing on the *National Register of Historic Places*, the John Leopard Homestead  
22 (site MW004). This site is within the construction footprint of the proposed EREF.  
23 Preconstruction activities would destroy site MW004 and the resulting impacts would be  
24 LARGE, but were considered MODERATE because the appropriate mitigation, involving  
25 professional excavation of, and data recovery at, site MW004 was implemented by AES and  
26 other homestead sites of this type exist in the region (WCRM, 2010; Idaho, SHPO 2010b;  
27 Gilbert, 2010). Other than for site MW004, the impacts of the proposed project on historic  
28 and cultural resources would be SMALL.  
29
- 30 • *Visual and Scenic Resources.* As described in Section 4.2.3, preconstruction and  
31 construction equipment and the industrial character of the proposed EREF buildings would  
32 create significant contrast with the surrounding visual environment of the primarily  
33 agricultural and undeveloped rangeland. The proposed facility would be about  
34 2.4 kilometers (1.5 miles) from public viewing areas such as US 20 and the Hell’s Half Acre  
35 Wildlife Study Area (WSA); thus, the impact on views would be SMALL to MODERATE.  
36
- 37 • *Air Quality.* As described in Section 4.2.4, preconstruction and construction traffic and  
38 operation of construction equipment are projected to cause a temporary increase in the  
39 concentrations of particulate matter. These impacts would be SMALL. However, fugitive  
40 dust from land clearing and grading operations could result in large releases of particulate  
41 matter for temporary periods of time. Such impacts would be MODERATE to LARGE during  
42 certain preconstruction periods and activities. Facility operations could produce small  
43 gaseous releases associated with operation of the process that could contain uranium  
44 compounds and hydrogen fluoride. Small amounts of nonradioactive air emissions would  
45 consist of carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM), volatile  
46 organic compounds (VOCs), and sulfur dioxide (SO<sub>2</sub>). Air quality impacts during operations  
47 would be SMALL.  
48

- 1 • *Geology and Soil.* As described in Section 4.2.5, impacts could result primarily during  
2 preconstruction and construction from surface grading and excavation activities that loosen  
3 soil and increase the potential for erosion by wind and water. Soil compaction as a result of  
4 heavy vehicle traffic could also increase the potential for soil erosion by increasing surface  
5 runoff. Spills and inadvertent releases during all project phases could contaminate site  
6 soils. Implementation of mitigation measures would ensure that these impacts would be  
7 SMALL.  
8
- 9 • *Water Resources.* As described in Section 4.2.6, the water supply for the proposed facility  
10 would be from onsite wells, and water usage would be well within the water appropriation for  
11 the proposed property. Also, the plant would have no discharges to surface water or  
12 groundwater. Thus, water resource impacts would be SMALL.  
13
- 14 • *Ecological Impacts.* As described in Section 4.2.7, impacts would occur primarily as a result  
15 of preconstruction and construction activities, which would mean the removal of shrub  
16 vegetation and the relocation and displacement of wildlife presently on the proposed site as  
17 a result of noise, lighting, traffic, and human presence. Collisions with vehicles, construction  
18 equipment, and fences may cause some wildlife mortality. No rare or unique communities  
19 or habitats or Federally listed threatened or endangered species have been found or are  
20 known to occur on the proposed site. The impact of the proposed EREF on ecological  
21 resources would be SMALL to MODERATE.  
22
- 23 • *Noise.* As described in Section 4.2.8, increased noise associated with the operation of  
24 construction machinery is expected during preconstruction and construction, with noise  
25 levels of between 80 to 95 dBA at the highway entrances, access roads, and the Visitor  
26 Center. Construction noise would be temporary and would be reduced to about 51 to  
27 66 dBA at the nearest hiking trail point on the Hell's Half Acre WSA. Impacts would be  
28 SMALL. Impacts during the operation of the facility itself would also be SMALL.  
29
- 30 • *Transportation.* As described in Section 4.2.9, the primary impact of preconstruction,  
31 construction, and operation on transportation resources is expected to be increased traffic  
32 on nearby roads and highways due to truck shipments and site worker commuting.  
33 Transportation impacts during preconstruction, construction, and facility operation would be  
34 SMALL to MODERATE on adjacent local roads (due to the potentially significant increase in  
35 average daily traffic), but regional impacts would be SMALL.  
36
- 37 • *Public and Occupational Health.* As described in Section 4.2.10, the analysis of  
38 nonradiological impacts during preconstruction and construction includes estimated  
39 numbers of injuries and illnesses incurred by workers and an evaluation of impacts due to  
40 exposure to chemicals and other nonradiological substances, such as particulate matter  
41 (dust) and vehicle exhaust. All such potential nonradiological impacts would be SMALL. No  
42 radiological impacts are expected during preconstruction and initial facility construction, prior  
43 to radiological materials being brought onsite. Operation of the proposed EREF could result  
44 in release of small quantities of UF<sub>6</sub> during normal operations. Total uranium released to the  
45 environment via airborne effluent discharges is anticipated to be less than 10 grams  
46 (6.84 μCi or 0.253 MBq) per year. No liquid effluent wastes are expected from facility  
47 operation. For a hypothetical member of the public at the proposed property boundary, the  
48 annual dose was estimated to be approximately 0.014 millisievert per year (1.4 millirem per



1 year). Doses attributable to normal operation of the proposed EREF facility would be small  
2 compared to the normal background dose range of 2.0 to 3.0 millisievert (200 to  
3 300 millirem). Radiological impacts during operations would be SMALL.

- 4
- 5 • *Waste Management.* As described in Section 4.2.11, small amounts of hazardous waste  
6 and approximately 6116 cubic meters (8000 cubic yards) of nonhazardous and  
7 nonradioactive wastes would be generated during preconstruction and construction  
8 activities. During operations, approximately 75,369 kilograms (165,812 pounds) of solid  
9 nonradioactive waste would be generated annually, including approximately 5062 kilograms  
10 (11,136 pounds) of hazardous wastes. Approximately 146,500 kilograms (322,300 pounds)  
11 of radiological and mixed waste would be generated annually, of which approximately  
12 100 kilograms (220 pounds) would be mixed waste. All wastes would be transferred offsite  
13 to licensed waste facilities with adequate disposal capacity for the wastes from the proposed  
14 EREF. Overall, impacts would be SMALL.
- 15
- 16 • *Socioeconomics.* As described in Section 4.2.12, there would be increases in regional  
17 employment, income, and tax revenue during preconstruction, construction, and operation.  
18 Although these impacts would be SMALL compared to the 11-county economic baseline,  
19 they are generally considered to be positive. Impacts on housing and local community  
20 services, which could be negative if significant population in-migration were to occur, would  
21 also be SMALL.
- 22
- 23 • *Environmental Justice.* As described in Section 4.2.13, the majority of the environmental  
24 impacts associated with preconstruction, construction, and operation of the proposed EREF  
25 that would affect the population as a whole would be SMALL, and generally would be  
26 mitigated if they were negative. Environmental impacts are primarily those affecting  
27 historical and cultural resources, visual and scenic resources, air quality, transportation, and  
28 facility accidents. However, as there are no minority or low-income populations defined  
29 according to CEQ guidelines within the 4-mile area around the proposed facility, there would  
30 be no disproportionate impacts on these populations as a result of this proposed project.
- 31
- 32 • *Accidents.* As described in Section 4.2.15, six accident scenarios were evaluated in this EIS  
33 as a representative selection of the types of accidents that are possible at the proposed  
34 EREF. The representative accident scenarios selected vary in severity from high- to  
35 intermediate-consequence events and include accidents initiated by natural phenomena  
36 (earthquakes), operator error, and equipment failure. The consequence of a criticality  
37 accident would be high (fatality) for a worker in close proximity. Worker health  
38 consequences are low to high from the other five accidents that involve the release of UF<sub>6</sub>.  
39 Radiological consequences to a maximally exposed individual (MEI) at the Controlled Area  
40 Boundary (proposed EREF property boundary) are low for all six accidents including the  
41 criticality accident. Uranium chemical exposure to the MEI is high for one accident and low  
42 for the remainder. For HF exposure to an MEI at the proposed property boundary, the  
43 consequence of three accidents is intermediate, with a low consequence estimated for the  
44 remainder. All accident scenarios predict consequences to the collective offsite public of  
45 less than one lifetime cancer fatality. Impacts from accidents would be SMALL to  
46 MODERATE.
- 47

1 **7.1.2 Benefits of the Proposed Action**  
2

3 The proposed action would result in the annual production of up to a maximum of 6.6 million  
4 separative work units (SWUs) of enriched uranium between 2022 and 2041. As discussed in  
5 Section 1.3 of this EIS, this level of production would represent an augmentation of the domestic  
6 supply of enriched uranium and would meet the need for increased domestic supplies of  
7 enriched uranium for national energy security. Under the proposed action, enriched uranium  
8 production would be undertaken with the latest enrichment technology, and would facilitate the  
9 generation of electricity with lower emissions of criteria pollutants and carbon.

10  
11 The proposed action would also result in small positive socioeconomic impacts in the 11-county  
12 ROI, as described in Section 4.2.12. Table 7-1 presents the estimated employment and tax  
13 revenue benefits associated with the proposed action. Employment in the 11-county ROI as a  
14 result of preconstruction activities is estimated at 308 full-time jobs. In addition, State income  
15 tax revenues would be \$0.1 million, and State sales and use tax receipts would be \$0.9 million  
16 during preconstruction. Average employment in the 11-county ROI during construction is  
17 estimated at 947 full-time jobs, with \$0.4 million in State income tax revenues and \$2.7 million in  
18 State sales taxes. During the construction/operations overlap period between 2014 and 2021,  
19 1645 jobs would be created in the first year, lasting throughout the startup period; \$0.7 million in  
20 income taxes would be generated annually for the State of Idaho; and \$1.8 million in property  
21 taxes would be collected annually by Bonneville County. During the operations phase between  
22 2022 and 2040, 3289 jobs would be created in the first year, lasting throughout the operating  
23 period, with fewer positions required in the last year of operations, 2041. During the operating  
24 period, the State of Idaho would benefit from \$1.3 million annually in income taxes, while  
25 Bonneville County would collect \$3.5 million annually in property tax receipts (AES, 2010a).

26  
27 As the decommissioning phase of the proposed EREF would occur more than 20 years in the  
28 future, decommissioning costs cannot be estimated with any certainty at this time.  
29 Decommissioning impacts would be SMALL, with impacts likely to be less than the impacts of  
30 operating the facility.

31  
32 Construction of an electrical transmission line to support the proposed EREF facility would  
33 produce 57 jobs, \$0.1 million in direct sales taxes, and \$0.1 million in direct income taxes.

34  
35 Although it can be assumed that some portion of State sales and income taxes paid would be  
36 returned to the 11-county ROI under revenue-sharing arrangements between each county and  
37 State government, the exact amount that would be received by each county cannot be  
38 determined.

39  
40 Beyond the economic and fiscal benefits of the proposed EREF in the 11-county ROI, the facility  
41 would also create fiscal benefits in the nation as a whole, primarily in the form of Federal income  
42 taxes on employee wages and salaries. Based on the distribution of employees in each salary  
43 category at the proposed facility, and current Federal marginal income tax rates, it is estimated  
44 that annual individual Federal income taxes during the peak year of facility construction would  
45 be \$15.5 million, with \$7.2 million produced annually during startup and \$14.5 million generated  
46 annually during facility operations. Federal income taxes would amount to \$2.8 million during  
47 preconstruction activities.

**Table 7-1 Socioeconomic Benefits Associated with the Proposed EREF  
in the 11-County ROI**

<b>Project Phase</b>	<b>Annual Average Direct and Indirect Jobs Created (full-time jobs)</b>	<b>Direct Annual State Income Tax Revenues (\$ million, 2008 \$)</b>	<b>Direct Annual State Sales Tax Revenues (\$ million, 2008 \$)</b>	<b>Annual Local Government Property Tax Revenues (\$ million, 2008 \$)</b>
Preconstruction	308	0.1	0.9	NA <sup>a</sup>
Construction	947	0.4	2.7	NA
Construction/Operations Overlap Period	1645	0.7	NA	1.8
Operation	3289	1.3	NA	3.5
Transmission Line	57	0.1	0.1	<0.1

<sup>a</sup> NA = not applicable.

Source: AES, 2010a.

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**7.1.3 Summary Regarding the Proposed Action**

This analysis shows that although there are economic and fiscal benefits associated with preconstruction, construction, and operation of the proposed EREF in the ROI, these impacts would be SMALL. There would also be costs resulting from impacts on various resource areas, which are not possible to quantify. For the majority of these resource areas, impacts would be SMALL or SMALL to MODERATE in magnitude.

**7.2 Comparative Benefit-Cost Analysis of Proposed Action Relative to No-Action Alternative**

This section compares selected costs and benefits of the proposed action to those of the no-action alternative. This comparison focuses on the tradeoffs between constructing the proposed EREF compared to not constructing the facility. Other possible actions involving other domestic and foreign uranium enrichment suppliers at existing and proposed new facilities both in the United States and elsewhere are likely to be similar under the two alternatives, and are therefore not considered in the comparison.

As a result of the lack of data that can be publicly disclosed or is otherwise available on private benefits (facility revenues) and costs (preconstruction, facility construction, and operating costs), the analysis focuses on the societal benefits and costs of the facility, including the impacts on employment, income, and tax revenues during the construction and operations phases in the region of influence around the proposed site, and the contribution of the proposed facility to meeting policy and technical objectives.

1 **7.2.1 No-Action Alternative**  
2

3 The proposed EREF would not be constructed, operated, and decommissioned under the no-  
4 action alternative; preconstruction activities at the proposed site that are not part of the  
5 proposed action could still take place (see Section 4.4). Preconstruction activities would include  
6 the disturbance of land associated with site clearing and preparation activities and the  
7 construction of ancillary facilities, meaning that some ecological, natural, and socioeconomic  
8 impacts would therefore occur. For the purposes of the no-action alternative, all potential local  
9 environmental impacts during the construction, operations, and decommissioning phases would  
10 be avoided. Similarly, all socioeconomic impacts related to employment, economic activity,  
11 population, housing, and community resources during the construction, operations, and  
12 decommissioning phases would not occur.  
13

14 **7.2.2 The Proposed Action**  
15

16 The benefits of preconstruction, construction, and operation of the proposed EREF on the  
17 economy in the 11-county ROI in which the plant is located, and on the State economy are  
18 described in Sections 4.2 and 7.1.2. Societal costs and impacts on land use, historical and  
19 cultural resources, visual and scenic resources, air quality, geology and soils, water resources,  
20 ecological resources, noise, transportation, public and occupational health, waste management,  
21 and environmental justice are described in Sections 4.2 and 7.1.1. In all cases, the impacts are  
22 too small to materially affect the comparative benefit-cost analysis.  
23

24 Other non-monetary cost areas described in Section 7.1.1 are not included as part of this  
25 comparison because the effect of these impacts is assumed to be either (1) approximately equal  
26 for the proposed action and the no-action alternative as defined above or (2) too small in  
27 differential impact to materially affect the comparative benefit-cost analysis.  
28

29 This analysis does not attempt to estimate the economic effects of a cheaper source of enriched  
30 uranium for nuclear power plants, or estimate the impact of lower enriched uranium prices on  
31 the ratio of nuclear and non-nuclear power in the domestic economy (1) on overall power  
32 demand and price and (2) on the potential economic benefits to consumers and suppliers.  
33

34 **7.2.3 Compliance with Policy and Technical Objectives**  
35

36 The following policy and technical objectives are relevant to the choice of an enrichment  
37 technology:  
38

- 39 • the need for enriched uranium to fulfill domestic electricity requirements
- 40 • the need for domestic supplies of enriched uranium for national energy security
- 41 • the need for upgraded uranium enrichment technology in the United States
- 42 • the need for energy generation with fewer emissions of criteria pollutants and carbon
- 43 • the need for energy generation with fewer emissions of criteria pollutants and carbon
- 44 • the need for energy generation with fewer emissions of criteria pollutants and carbon
- 45 • the need for energy generation with fewer emissions of criteria pollutants and carbon
- 46 • the need for energy generation with fewer emissions of criteria pollutants and carbon

47 The following sections compare the proposed action and the no-action alternative in terms of  
48 how well they meet each of these objectives.  
49

1 **7.2.3.1 Meeting Demand for Enriched Uranium**  
2

3 Currently, the demand for enriched uranium in the United States for domestic electricity  
4 production is met from two categories of sources:

- 5  
6 • domestic production of enriched uranium  
7  
8 • other foreign sources  
9

10 The current 5-year average U.S. demand for enriched uranium is 14 million SWUs per year  
11 (EIA, 2010). From 2005 through 2009, the United States Enrichment Corporation delivered  
12 approximately 10 to 13.5 million SWUs to customers annually, of which 5.5 million SWUs per  
13 year were from the Megatons to Megawatts Program. Of the remaining 4.5 to 7.5 million  
14 SWUs, an average of approximately 2 million SWUs were sold for use in the United States and  
15 the balance exported (USEC, 2010). Therefore, of the amount sold for use in the United States,  
16 approximately 2 million SWUs (about 15 percent of U.S. demand) come from enrichment at the  
17 Paducah Gaseous Diffusion Plant (PGDP) and 5.5 million SWUs (about 38 percent of  
18 U.S. demand) come from downblending at the Megatons to Megawatts Program, which  
19 depends on deliveries from Russia (EIA, 2010; USEC, 2010). Capacity at the proposed EREF  
20 could theoretically be sold only to the U.S. market, thus reducing the overall foreign dependence  
21 to approximately 6 million SWUs (43 percent of U.S. demand).  
22

23 **7.2.3.2 National Energy Security**  
24

25 Currently, foreign sources supply as much as 85 percent of the U.S. demand for enriched  
26 uranium. The primary domestic production of enriched uranium currently takes place at a single  
27 plant – the Paducah Gaseous Diffusion Plant. The heavy dependence on foreign sources and  
28 the lack of diversification of domestic sources of enriched uranium represent a potential  
29 reliability risk for the domestic nuclear energy industry, which supplies 20 percent of national  
30 energy requirements. Interagency discussions led by the National Security Council have  
31 concluded that the United States should maintain a viable and competitive domestic uranium  
32 enrichment industry for the foreseeable future (DOE, 2002). The U.S. Department of Energy  
33 (DOE) has noted the importance of promoting the development of additional domestic  
34 enrichment capacity to achieve this objective (DOE, 2002).  
35

36 It is anticipated that all gaseous diffusion enrichment operations in the United States will cease  
37 in 2012 due to the higher cost of aging facilities (DOE, 2007). Furthermore, the Megatons to  
38 Megawatts Program is scheduled to expire in 2013. As noted above, these two sources meet  
39 more than half of the current U.S. demand for low-enriched uranium (LEU). As a result, new  
40 domestic sources of enriched uranium are needed to reliably provide fuel to both the existing  
41 and future nuclear power plants in the United States. Thus, projected 6 million SWUs  
42 production from the proposed EREF has the potential to be crucial to meeting the nuclear power  
43 industry's needs and to increasing the nation's energy security. This benefit is potentially  
44 LARGE.  
45  
46



1 **7.2.3.3 Technology Upgrade**  
2

3 A DOE–USEC agreement in 2002 regarding the proposed American Centrifuge Plant in  
4 Piketon, Ohio, was intended to “facilitate the deployment of new, cost-effective advanced  
5 treatment technology in the U.S. on a rapid scale” (NRC, 2006). Similarly, the proposed action  
6 represents the implementation of a technology that is contemporary, cost-effective, and reliable  
7 (such as the gas centrifuge technology to be used in the proposed EREF). The proposed action  
8 is therefore better able to address the objective of upgraded domestic uranium enrichment  
9 technology than the no-action alternative, in which no technology is implemented.  
10

11 **7.2.3.4 Energy Generation with Fewer Emissions of Criteria Pollutants and Carbon**  
12

13 Production of enriched uranium at the proposed EREF would support an increase in electricity  
14 production using nuclear technology. Compared to the most likely alternative, coal-fired power  
15 plants, nuclear electricity generation results in fewer emissions of criteria pollutants such as  
16 nitrogen oxides, sulfur dioxide, and particulate matter, as well as reduced emissions of carbon.  
17 In addition, the gas centrifuge technology being chosen for the proposed EREF is less energy-  
18 intensive than the existing gaseous diffusion technology. Therefore, regional air quality and  
19 environmental impacts would be further reduced. On a national basis, these environmental  
20 benefits of the proposed action would be MODERATE.  
21

22 **7.2.4 Conclusions Regarding the Proposed Action versus the No-Action Alternative**  
23

24 Based on consideration of local and national socioeconomic benefits, and the costs of  
25 preconstruction, construction, and operation of the proposed EREF on a range of environmental  
26 resources, and on public and occupational health, the proposed action is preferable relative to  
27 the no-action alternative in the following respects:  
28

- 29 • The proposed action better satisfies DOE’s policy and technical objectives for meeting future  
30 demand, national energy security, technological upgrades, and reducing emissions of  
31 criteria pollutants and carbon; and  
32
- 33 • The proposed action would have positive impacts in the 11-county ROI on employment,  
34 income, and tax revenues during the preconstruction, construction, operations, and  
35 decommissioning phases.  
36

37 **7.3 Overall Benefit-Cost Conclusions**  
38

39 While there are national energy security and fiscal benefits associated with the proposed action,  
40 and local socioeconomic benefits in the 11-county ROI in which the proposed EREF would be  
41 located, there are also direct costs associated with the preconstruction, construction, and  
42 operation phases of the proposed project, as well as impacts associated with the proposed  
43 action on various resource areas. However, these impacts are estimated to be small in  
44 magnitude and small in comparison to the local and national benefits of the proposed action.  
45

46 Although the no-action alternative would include the continuation of enriched uranium  
47 production using gaseous diffusion technology and imported enriched uranium supplies, in order  
48 to satisfy domestic demand, the proposed action better satisfies DOE’s policy and technical

1 objectives. These objectives require meeting future demand for enriched uranium and improved  
2 national energy security with the desired technology upgrades. Also, under the proposed  
3 action, there would be fewer emissions of criteria pollutants and carbon. The staff concludes  
4 that in comparison to the no-action alternative, the proposed action is associated with significant  
5 net positive benefits.  
6

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1 (WCRM, 2010) Western Cultural Resources Management, Inc. Letter from J. Sigler (WCRM) to  
2 K. Reid (Idaho Deputy SHPO) dated November 17, 2010. "To Summarize Western Cultural  
3 Resource Management's Data Recovery Activities for the Eagle Rock Enrichment Facility  
4 Project Located in Bonneville County, Idaho." ADAMS Accession No. ML103280087.  
5

## 8 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

On December 30, 2008, AREVA Enrichment Services, LLC (AES) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for a license to construct, operate, and decommission the proposed Eagle Rock Enrichment Facility (EREF) (AES, 2008). AES proposes to locate the facility in Bonneville County, Idaho, approximately 32 kilometers (20 miles) west of Idaho Falls. Revisions to the license application were submitted on April 23, 2009 (Revision 1) (AES, 2009a) and April 30, 2010 (Revision 2) (AES, 2010a). If licensed, the proposed EREF would enrich uranium for use in commercial nuclear fuel for power reactors. Feed material would consist of non-enriched uranium hexafluoride (UF<sub>6</sub>). AES would employ a gas centrifuge-based enrichment process to enrich uranium to up to 5 percent uranium-235 by weight, with a planned maximum target production of 6.6 million separative work units (SWUs) per year. The proposed EREF would be licensed in accordance with the provisions of the *Atomic Energy Act*. Specifically, an NRC license under Title 10, "Energy," of the U.S. *Code of Federal Regulations* (10 CFR) Parts 30, 40, and 70 would be required to authorize AES to possess and use byproduct material, source material, and special nuclear material at the proposed EREF.

AES expects to begin preconstruction in late 2010. If the license application is approved, AES expects to begin facility construction in 2011, which would continue for 11 years. AES anticipates commencing initial production in 2014 and reaching full production in 2022. Prior to license expiration in 2041, AES would decide to seek to renew its license to continue operating the facility or plan for the decontamination and decommissioning of the facility per the applicable licensing conditions and NRC regulations.

Section 102 of the *National Environmental Policy Act of 1969*, as amended (NEPA) (Public Law 91-190; Title 42, Section 4321 et seq., *United States Code* [42 U.S.C. 4321 et seq.]), directs that an Environmental Impact Statement (EIS) is required for major Federal actions that significantly affect the quality of the human environment. Section 102(2)(C) of NEPA requires that an EIS include information about the following:

- the environmental impacts of the proposed action
- any adverse environmental effects that cannot be avoided, should the proposal be implemented
- alternatives to the proposed action
- the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity
- any irreversible and irretrievable commitments of resources that would be involved if the proposed action is implemented

NRC's regulations under 10 CFR Part 51 implement the requirements of NEPA. In particular, 10 CFR 51.20(b)(10) states that issuance of a license for a uranium enrichment facility requires the NRC to conduct an environmental review and prepare an EIS. As part of its license application and two license application revisions, AES submitted an Environmental Report (ER)

1 and ER Revisions 1 and 2. Information in the ERs and supplemental environmental  
2 documentation provided by AES has been reviewed and independently verified by the NRC and  
3 used, in part, by the NRC in preparing the EIS. ER Revision 2 (AES, 2010b) incorporates the  
4 supplemental environmental documentation provided by AES subsequent to the submittal of ER  
5 Revision 1, with the exception of some responses to requests for additional information  
6 (AES, 2009b) and supplemental information provided subsequent to ER Revision 2 (North  
7 Wind, 2010) that were also used in the preparation of this EIS.  
8

9 The April 23, 2009, Revision 1 to the AES license application provided details on an expansion  
10 of the maximum annual production of the proposed EREF from 3.3 to 6.6 million SWUs per  
11 year. On June 17, 2009, AES submitted a request for an exemption from certain NRC  
12 regulations to allow commencement of certain preconstruction activities (e.g., site preparation)  
13 prior to issuance of the NRC license (AES, 2009c). On October 15, 2009, AES provided  
14 information that distinguishes between the environmental impacts of the preconstruction  
15 activities specified in its exemption request and those of NRC-authorized construction activities  
16 that will not be undertaken unless a license is granted (AES, 2009d). Supplemental information  
17 on the proposed transmission line required to power the proposed EREF was submitted by AES  
18 on February 18, 2010 (AES, 2010c). On March 17, 2010, the NRC granted an exemption  
19 (NRC, 2010) authorizing AES to conduct the preconstruction activities on the proposed EREF  
20 site, which AES had requested in its June 17, 2009, exemption request.  
21

22 Upon acceptance of the ER, the NRC began the environmental review process described in  
23 10 CFR Part 51 by publishing, on May 4, 2009, in the *Federal Register* (74 FR 20508) a Notice  
24 of Intent to prepare an EIS and conduct scoping. The purpose of the EIS scoping process was  
25 to assist in determining the range of actions, alternatives to the proposed action, and potential  
26 impacts to be considered in the EIS, and to identify significant issues related to the proposed  
27 action. Comments and information from the public and government agencies were obtained  
28 during the scoping period. As part of the scoping process, the NRC staff held a public scoping  
29 meeting on June 4, 2009, in Idaho Falls, Idaho. NRC staff considered the public comments  
30 received during the scoping process for preparation of this EIS; the summary of the EIS scoping  
31 process is provided in Appendix A (the September 2009 Scoping Summary Report).  
32

33 In addition to reviewing AES's ER and supplemental documentation, the NRC staff consulted  
34 with appropriate Federal, State, and local agencies and Tribal organizations. On June 2–4,  
35 2009, the NRC staff met with officials of a number of these agencies and organizations and also  
36 conducted a site visit and technical meetings with AES.  
37

38 Further comments from the public and government agencies were received after the NRC staff  
39 issued a Draft EIS for public review and comment on July 21, 2010, and announced its  
40 availability in the *Federal Register* (75 FR 4266) in accordance with 10 CFR 51.73, 51.74, and  
41 51.117. The public comment period ended on September 13, 2010. During the public comment  
42 period, the NRC staff held two public meetings – in Boise, Idaho, on August 9, 2010, and in  
43 Idaho Falls, Idaho, on August 12, 2010 – where oral comments from members of the public  
44 were received on the Draft EIS. In addition to oral comments received at the public meetings,  
45 the NRC staff received written comments on the Draft EIS at the public meetings and by postal  
46 mail and email during the public comment period. The transcripts of the public meetings and  
47 the written comments received are part of the public record for the proposed project and were  
48 considered by the NRC staff in preparing this EIS. Comment summaries and the NRC staff's  
49 responses are contained in Appendix I of this EIS.  
50



1 Included in this EIS are (1) the results of the NRC staff's analyses, which consider and weigh  
2 the environmental effects of preconstruction and the proposed action; (2) mitigation measures  
3 for reducing or avoiding adverse effects; (3) the environmental impacts of alternatives to the  
4 proposed action; and (4) the NRC staff's recommendation regarding the proposed action based  
5 on its environmental review.  
6

7 Potential environmental impacts are evaluated in this EIS using the three-level standard of  
8 significance – SMALL, MODERATE, or LARGE – developed by the NRC using guidelines from  
9 the Council on Environmental Quality (CEQ) (40 CFR 1508.27). Table B-1 of 10 CFR Part 51,  
10 Subpart A, Appendix B, provides the following definitions of the three significance levels:  
11

- 12 • SMALL – Environmental effects are not detectable or are so minor that they would neither  
13 destabilize nor noticeably alter any important attribute of the resource.
- 14
- 15 • MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize,  
16 important attributes of the resource.
- 17
- 18 • LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize  
19 important attributes of the resource.  
20

## 21 **8.1 Unavoidable Adverse Environmental Impacts**

22

23 Section 102(2)(c)(ii) of NEPA requires that an EIS include information on any adverse  
24 environmental effects that cannot be avoided, should the proposed action be implemented.  
25 Unavoidable adverse environmental impacts are those potential impacts of the NRC action that  
26 cannot be avoided and for which no practical means of mitigation are available.  
27

28 The environmental impacts associated with the proposed action and with the no-action  
29 alternative are described in detail in Chapter 4 for each resource area. The impacts of these  
30 two alternatives are summarized and compared in Section 2.4. Chapter 4 also discusses the  
31 mitigation measures that AES proposed in its ER to mitigate the potential impacts of the  
32 proposed action and the mitigation measures identified by the NRC. These two sets of  
33 mitigation measures are summarized in Chapter 5, Tables 5-1 and 5-2 and Tables 5-3 and 5-4,  
34 respectively. The cumulative impacts on the environment that would result from the proposed  
35 action when added to other past, present, and reasonably foreseeable future actions, regardless  
36 of what agency or person undertakes such actions, are described in Section 4.3.  
37

38 As discussed in Chapter 4, the environmental impacts that would result if the proposed action  
39 were to be implemented as proposed by AES would mostly be SMALL and would, in most  
40 cases, be mitigated by the methods proposed by AES. The only resource areas in which  
41 certain impacts would be classified as SMALL to MODERATE would be visual and scenic  
42 resources, ecological resources, and transportation. In addition, impacts on historic and cultural  
43 resources as a result of preconstruction activities would be MODERATE with appropriate  
44 mitigation, and air quality impacts from fugitive dust would be MODERATE to LARGE on a  
45 temporary basis during preconstruction and construction activities.  
46

47 The primary impact on historic and cultural resources would result from the destruction during  
48 EREF preconstruction activities of site MW004, the John Leopard Homestead, which has been

1 recommended as eligible for listing in the *National Register of Historic Places*. However, the  
2 mitigation of this site by AES prior to its disturbance results in a MODERATE level for this  
3 impact.

4  
5 The proposed EREF would create a significant contrast with the surrounding visual  
6 environment, presenting a MODERATE impact to visual and scenic resources. The extent of  
7 the proposed EREF and the industrial nature of its buildings are not in character with the  
8 surrounding viewshed, which includes the surrounding grazing and agricultural lands and the  
9 Hell's Half Acre Wilderness Study Area/National Natural Landmark approximately 2.4 kilometers  
10 (1.5 miles) to the south.

11  
12 The impact level on ecological resources has been classified as MODERATE during  
13 preconstruction and construction activities because these activities would result in the removal  
14 of sagebrush steppe and nonirrigated pasture vegetation. Indirect impacts of preconstruction  
15 and construction would include the generation of fugitive dust, erosion of disturbed areas, and  
16 potential sedimentation of downgradient habitats. Also, preconstruction and construction  
17 activities would result in some wildlife mortality and cause other wildlife to relocate as a result of  
18 noise, lighting, traffic, and human presence. Collisions with vehicles or construction equipment  
19 may cause some wildlife mortality as well.

20  
21 The transportation impacts on US 20 in the immediate vicinity of the proposed EREF would be  
22 SMALL to MODERATE due to increases in traffic density (primarily from commuting workers)  
23 during preconstruction and facility construction, and when facility construction and initial  
24 operations overlap.

25  
26 The ground-disturbing activities during preconstruction and construction would result in  
27 increased fugitive dust emissions and cause MODERATE to LARGE air quality impacts.  
28 However, air quality impacts would be at the MODERATE to LARGE level only temporarily.  
29 The majority of the time, these impacts would be SMALL.

## 30 31 **8.2 Relationship between Local Short-Term Uses of the Environment and the** 32 **Maintenance and Enhancement of Long-Term Productivity**

33  
34 Consistent with the CEQ definition in 40 CFR 1502.16 and the definition provided in Section 5.8  
35 of NUREG-1748, *Environmental Review Guidance for Licensing Actions Associated with NMSS*  
36 *Programs* (NRC, 2003), this EIS defines short-term uses and long-term productivity as follows:

- 37  
38 • Short-term uses generally affect the present quality of life for the public (i.e., the 30-year  
39 license period for the proposed EREF).  
40  
41 • Long-term productivity affects the quality of life for future generations on the basis of  
42 environmental sustainability (i.e., long-term is the period after license termination for the  
43 proposed EREF).  
44

45 Preconstruction, construction, and operation of the proposed EREF would necessitate short-  
46 term commitments of resources. The short-term commitment of resources would include the  
47 use of materials required to construct new buildings and operation support facilities,  
48 transportation resources, and other materials and disposal resources for operations at the

1 proposed EREF. Preconstruction, construction, operations, and decommissioning of the  
2 proposed EREF would also require the permanent commitment of energy and water resources.  
3 The short-term use of resources would result in potential long-term socioeconomic benefits to  
4 the local area and the region, such as improvements to the local economy and infrastructure  
5 supported by worker income and tax revenues and the maintenance and enhancement of a  
6 skilled worker base.

7  
8 Workers, the public, and the environment would be exposed to increased amounts of  
9 radioactive and hazardous materials over the short term from the operation of the proposed  
10 EREF and the associated materials, including process emissions and the handling of waste.  
11 Construction and operation of the proposed EREF would require a long-term commitment of  
12 terrestrial resources, such as land, water, and energy. Impacts would be minimized by the  
13 application of proper mitigation measures and resource management. In closing the EREF,  
14 AES would decontaminate and decommission the buildings and equipment and restore them for  
15 unrestricted use. This work would make the buildings and the site available for other uses. The  
16 use of the site and the buildings for other industrial purposes would constitute a long-term  
17 benefit to the community and would increase long-term productivity. Continued employment,  
18 expenditures, and tax revenues generated during preconstruction, construction, and operation  
19 of the proposed EREF and from future site uses after the EREF is decommissioned would  
20 directly benefit the local, regional, and State economies and would be considered a long-term  
21 benefit.

### 22 23 **8.3 Irreversible and Irretrievable Commitment of Resources**

24  
25 Irreversible commitment of resources refers to resources that are destroyed and cannot be  
26 restored, whereas an irretrievable commitment of resources refers to material resources that  
27 once used cannot be recycled or restored for other uses by practical means (NRC, 2003).  
28 The implementation of the proposed action as described in Section 2.1 would include the  
29 commitment of land, water, energy, raw materials, and other natural and manmade resources.  
30 About 240 hectares (592 acres) on the 1700-hectare (4200-acre) property to be purchased by  
31 AES would be used for the preconstruction, construction, and operation of the proposed EREF.  
32 AES has stated that following decontamination and decommissioning, all parts of the plant and  
33 site would be available for unrestricted use (AES, 2010b). Therefore, if the license is granted,  
34 the 240-hectare (592-acre) parcel of land would likely remain in industrial use beyond license  
35 termination.

36  
37 Preconstruction, construction, and operation of the proposed EREF would use groundwater  
38 resources from the Eastern Snake River Plain (ESRP) aquifer. The proposed EREF is a  
39 consumptive water-use facility, meaning all water would be used and none would be returned to  
40 its original source. Although the amount of water from the ESRP aquifer that would be used by  
41 the proposed EREF represents a small percentage of the total capacity of the facility's water  
42 right appropriation, this water would be lost in three ways: (1) the water would evaporate from  
43 the liquid effluent treatment system evaporator and the two Cylinder Storage Pads Stormwater  
44 Retention Basins; (2) the water would evaporate or infiltrate into the ground from the Site  
45 Stormwater Retention Basin; and (3) infiltrated groundwater would undergo evapotranspiration.  
46 It is unlikely that any of the water used by the proposed EREF would replenish the ESRP  
47 aquifer or reach adjacent properties.

1 Energy expended would be in the form of fuel (gasoline and diesel) for equipment and electricity  
2 for facility preconstruction, construction, and operations. There are no plans to use natural gas  
3 at the proposed EREF. The electrical energy requirement for EREF operation would represent  
4 a small increase in the electrical energy demand of the area. Improvements in the local area's  
5 electrical power capacity to support the proposed EREF (i.e., the upgrade/addition of an  
6 electrical transmission line and substations) would contribute to a slight increase in the  
7 irreversible and irretrievable commitment of resources because of the dedication of a small  
8 portion of land and material that would be needed for such improvements and the expansion of  
9 services.

10  
11 Resources that would be committed irreversibly or irretrievably during preconstruction,  
12 construction, and operation of the proposed EREF include materials that could not be recovered  
13 or recycled and materials that would be consumed or reduced to unrecoverable forms.  
14 Preconstruction and construction of the proposed EREF would involve the commitment of  
15 varying amounts of building materials. During operation, the proposed EREF would generate a  
16 small amount of nonrecyclable waste streams, such as hazardous and radiological wastes.  
17 Generation of these waste streams would represent an irreversible and irretrievable  
18 commitment of material resources.

19  
20 Even though the land used to construct the proposed EREF would be returned to other  
21 productive uses after the facility is decommissioned, there would be some irreversible  
22 commitment of land at some offsite locations used to dispose of solid wastes generated at the  
23 proposed EREF. In addition, wastes generated during the conversion of depleted UF<sub>6</sub> produced  
24 at the proposed EREF and the depleted uranium oxide conversion product from the depleted  
25 UF<sub>6</sub> conversion would be disposed of at an offsite location (see Section 2.1.5). The land used  
26 for the disposal of these materials would also represent an irreversible commitment of land. No  
27 solid wastes or depleted uranium oxide conversion product originating from the proposed EREF  
28 would be disposed of on the EREF property.

29  
30 When the facility is decommissioned, some of the materials used in its construction, such as  
31 concrete, steel, other metals, plastics, and other materials, would be recycled and reused.  
32 Other materials would be disposed of in licensed and approved offsite locations. The amount of  
33 land used to dispose of these materials would also be an irretrievable land resource.

34  
35 During the operation of the proposed EREF, natural UF<sub>6</sub> would be used as the feed material.  
36 This would require the mining of uranium (not licensed by the NRC) and other operational steps  
37 in the front end of the uranium fuel cycle (licensed by the NRC) that result in the production of  
38 UF<sub>6</sub>. The use of uranium minerals would be an irretrievable resource commitment. There  
39 would also be other irreversible and irretrievable commitments of resources during uranium fuel  
40 cycle operations that result in the production of natural UF<sub>6</sub> feed. As shown in Figure 1-2, there  
41 are several fuel cycle operations leading up to the production of the natural UF<sub>6</sub> that feed  
42 enrichment operations. These steps include the mining and processing of uranium ore, which  
43 result in the production of natural triuranium octaoxide (U<sub>3</sub>O<sub>8</sub>) and conversion of natural U<sub>3</sub>O<sub>8</sub> to  
44 UF<sub>6</sub>. All materials and energy used in the construction and operation of the facilities used to  
45 mine and process the uranium ore and convert natural U<sub>3</sub>O<sub>8</sub> to natural UF<sub>6</sub> would constitute an  
46 irreversible and irretrievable commitment of resources.

47

## 8.4 References

(AES, 2008) AREVA Enrichment Services, LLC. "Eagle Rock Enrichment Facility, Application for a Uranium Enrichment Facility License Under 10 CFR 70, 'Domestic Licensing of Special Nuclear Material.'" December. <[http://adamswebsearch2.nrc.gov/idmws/doccontent.dll?library=PU\\_ADAMS^PBNTAD01&ID=090770339](http://adamswebsearch2.nrc.gov/idmws/doccontent.dll?library=PU_ADAMS^PBNTAD01&ID=090770339)> (Accessed August 18, 2009). ADAMS Accession No. ML090300656.

(AES, 2009a) AREVA Enrichment Services, LLC. Letter from Sam Shakir (President and CEO, AES) to the U.S. Nuclear Regulatory Commission dated April 23, 2009. "Subject: Revision 1 to License Application for the Eagle Rock Enrichment Facility." ADAMS Accession No. ML091210638.

(AES, 2009b) AREVA Enrichment Services, LLC. Letter from Jim Kay (Licensing Manager, AES) to the U.S. Nuclear Regulatory Commission dated September 9, 2009. "Subject: Response to Requests for Additional Information – AREVA Enrichment Services LLC Environmental Report for the Eagle Rock Enrichment Facility." ADAMS Accession No. ML092530636.

(AES, 2009c) AREVA Enrichment Services, LLC. Letter from Sam Shakir (President and CEO, AES) to the U.S. Nuclear Regulatory Commission dated June 17. "Subject: Request for Exemption from 10 CFR 70.4, 10 CFR 70.23(a)(7), 10 CFR 30.4, 10 CFR 30.33(a)(5), 10 CFR 40.4, and 10 CFR 40.32(e) Requirements Governing 'Commencement of Construction.'" ADAMS Accession No. ML091770390.

(AES, 2009d) AREVA Enrichment Services, LLC. Letter from Jim Kay (Licensing Manager, AES) to the U.S. Nuclear Regulatory Commission dated October 15. "Subject: Response to Request for Additional Information – AES Eagle Rock Enrichment Facility Exemption Request Related to Commencement of Construction (TAC L32730)." ADAMS Accession No. ML092920169.

(AES, 2010a) AREVA Enrichment Services, LLC. "Eagle Rock Enrichment Facility, Revision 2 to License Application." Bethesda, Maryland. April. ADAMS Accession No. ML101610549.

(AES, 2010b) AREVA Enrichment Services, LLC. "Eagle Rock Enrichment Facility Environmental Report, Rev. 2." Bethesda, Maryland. April. ADAMS Accession No. ML101610549.

(AES, 2010c) AREVA Enrichment Services, LLC. Letter from Jim Kay (Licensing Manager, AES) to the U.S. Nuclear Regulatory Commission dated February 18. "Subject: Environmental Report for the Eagle Rock Enrichment Facility; Supplemental Information - Revised Appendix H, EREF 161-KV Transmission Line Project." ADAMS Accession No. ML100540134.

(North Wind, 2010) North Wind, Inc. "Sage Grouse Survey Report, Eagle Rock Enrichment Facility." May 13. ADAMS Accession No. ML101390471.

(NRC, 2003) U.S. Nuclear Regulatory Commission. "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs." NUREG-1748. August.



1 (NRC, 2010) U.S. Nuclear Regulatory Commission. Letter from D. Dorman (U.S. Nuclear  
2 Regulatory Commission) to G. Harper (AREVA Enrichment Services, LLC) dated March 17.  
3 “Subject: Approval of AREVA Enrichment Services LLC Exemption Request Related to  
4 Requirements Governing Commencement of Construction (TAC L32730).”  
5

1 **9 AGENCIES AND ORGANIZATIONS CONTACTED**

2  
3 The following sections list the agencies and organizations contacted by the U.S. Nuclear  
4 Regulatory Commission to discuss the Eagle Rock Enrichment Facility project and/or obtain  
5 comments, information, and data for use in preparing this Environmental Impact Statement.  
6 Position titles/functions of agency/organization personnel are included where known.  
7

8 **9.1 Federal Agencies**

9  
10 Advisory Council on Historic Preservation, Washington, D.C.  
11 Reid Nelson, Director, Office of Federal Agency Programs  
12 Tom McCulloch, Archaeologist  
13 Raymond V. Wallace, Historic Preservation Technician  
14

15 U.S. Department of Energy (DOE), Headquarters, Washington, D.C.  
16 Carol Borgstrom, Director, Office of NEPA Policy and Compliance  
17

18 U.S. Department of Energy, Idaho National Laboratory (INL), Idaho Falls, Idaho  
19 Bruce Angle, Environmental Management System Manager  
20 Miriam Taylor, Transportation Specialist  
21

22 U.S. Department of Energy, Idaho Operations Office, Idaho Falls, Idaho  
23 Jack Depperschmidt, NEPA Compliance Officer  
24 Richard Kauffman, Interim NEPA Compliance Officer  
25

26 U.S. Department of Energy, Loan Programs Office, Washington, D.C.  
27 Matthew McMillen, Director, Environmental Compliance Division  
28 Patrick Gorman, Environmental Specialist  
29 Joseph Montgomery, Consultant  
30

31 U.S. Department of the Interior, Washington, D.C.  
32 Director, Office of Environmental Policy and Compliance  
33

34 U.S. Department of the Interior, Bureau of Land Management, Idaho Falls District, Idaho Falls,  
35 Idaho

36 Joe Kraayenbrink, District Manager  
37 Karen Rice, Associate District Manager  
38

39 U.S. Department of the Interior, Bureau of Land Management, Upper Snake River Field Office,  
40 Idaho Falls, Idaho

41 Wendy Reynolds, Upper Snake Field Manager  
42 Rebecca Lazdauskas, Realty Specialist  
43 Mark Ennes, District NEPA Coordinator  
44 Mark Kennison, District NEPA Coordinator  
45 Stephanie Balbarini, Solicitor  
46 William Boggs, Visual Resource Management Coordinator  
47

1 U.S. Department of the Interior, Fish and Wildlife Service, Eastern Idaho Field Office,  
2 Chubbuck, Idaho  
3 Damien Miller, Supervisor  
4 Gary Burton, Acting Supervisor  
5 Ty Matthews, Fish and Wildlife Biologist  
6  
7 U.S. Department of the Interior, National Park Service, Craters of the Moon National Monument  
8 & Preserve, Arco, Idaho  
9 Doug Neighbor, Superintendent  
10  
11 U.S. Department of the Interior, National Park Service, National Natural Landmarks Program,  
12 Sedro Woolley, Washington  
13 Steve Gibbons, Coordinator  
14  
15 U.S. Department of the Interior, National Park Service, Pacific West Region, Seattle,  
16 Washington  
17 Rory Westberg, Acting Regional Director  
18 Keith Dunbar, Chief of Park Planning and Environmental Compliance  
19 Kelly Powell, Realty Specialist  
20  
21 U.S. Environmental Protection Agency, Region 10, Seattle, Washington  
22 Christine B. Reichgott, Manager, Environmental Review & Sediment Management Unit  
23 Theogene Mbabaliye, Environmental Scientist  
24

25 **9.2 Federally Recognized Indian Tribes**

26  
27 The Shoshone-Bannock Tribes, Fort Hall Indian Reservation, Idaho  
28  
29 Nathan Small, Chairman, Fort Hall Business Council (FHBC)  
30 Alonzo Coby, Former Chairman, FHBC  
31 Willie Preacher, Tribal DOE Program Director  
32 Carolyn Smith, Cultural Resource Coordinator  
33 Tino Batt, Member, FHBC  
34 Devon Boyer, Member, FHBC  
35 Blaine Edmo, Member, FHBC  
36 Glenn Fisher, Member, FHBC  
37 Ann Lindroth, Member, FHBC  
38 Lee Juan Taylor, Member, FHBC  
39 LaRae Buckskin, Cultural Resources Research  
40 Camille Carter, Emergency Response  
41 Christina Cutler, Tribal DOE Environmental Specialist  
42 Wes Jones, Emergency Response  
43 Patrick Teton, Chief of Police  
44 Mel Timbana  
45 Roger Turner, Program Manager  
46  
47

1 **9.3 State Agencies**

2  
3 Idaho Department of Environmental Quality (IDEQ), Headquarters Office, Boise, Idaho  
4 Toni Hardesty, Director

5  
6 Idaho Department of Environmental Quality, IDEQ State Office, Technical Services Division,  
7 Boise, Idaho  
8 Mark Dietrich, Division Administrator and State Response Program Manager  
9 Orville Green, Waste Program Administrator  
10 Craig Halverson

11  
12 Idaho Department of Environmental Quality, Idaho Falls Regional Office, Idaho Falls, Idaho  
13 Erick Neher, Regional Administrator  
14 Lezlie Aller, INL Oversight Manager  
15 David Jones, Senior Health Physicist  
16 Bruce LaRue

17  
18 Idaho Department of Fish and Game, Headquarters Office, Boise, Idaho  
19 Cal Groen, Director  
20 Sharon W. Kiefer, Assistant Director – Policy  
21 Lance Hebdon, Inter-Governmental Policy Coordinator  
22 Tom Hemker, Wildlife Program Coordinator  
23 Don Kemner, Wildlife Program Coordinator

24  
25 Idaho Department of Fish and Game, Upper Snake River Region, Idaho Falls, Idaho  
26 Gary Vecellio, Environmental Review and Coordination

27  
28 Idaho Department of Water Resources, Eastern Regional Office, Idaho Falls, Idaho  
29 Ernest Carlsen, Water Rights Supervisor

30  
31 Idaho State Historical Society, State Historic Preservation Office, Boise, Idaho  
32 Janet Gallimore, Executive Director  
33 Susan Pengilly, Deputy State Historic Preservation Officer  
34 Ken Reid, State Archaeologist and Deputy State Historic Preservation Officer

35  
36 Idaho Transportation Department, District 6, Rigby, Idaho  
37 Timothy Cramer, Senior Environmental Planner  
38 Matthew Davison, District 6 Traffic Engineer  
39 Ken Hahn, District Maintenance Engineer  
40 Blake Rindlisbacher, District 6 Engineer  
41 Bill Shaw, District Planner  
42 David Walrath, Project Development Engineer

43  
44 Idaho Office of Energy Resources, Boise, Idaho  
45 Paul Kjellander, Administrator

46  
47

1 **9.4 Local Governments and Agencies**

2

3 Bingham County Commissioners, Blackfoot, Idaho

4 A. Ladd Carter, Commissioner – District 3

5 Donavan Harrington, Commissioner – District 2

6 Cleone Jolley, Commissioner – District 1

7 W. Brower, Former Commissioner

8

9 Bonneville County Commissioners, Idaho Falls, Idaho

10 Roger Christensen, Commissioner – District 1

11 Dave Radford, Commissioner – District 2

12 Lee Staker, Commissioner – District 3

13

14 Bonneville County Planning and Zoning Department, Idaho Falls, Idaho

15 Steven Serr, Planning and Zoning Director

16

17 Bonneville County Public Works Department, Idaho Falls, Idaho

18 Kevin Eckersell, Public Works Director

19

20 Bonneville Metropolitan Planning Organization, Idaho Falls, Idaho

21 Darrell West, Director

22

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<p>11. ABSTRACT (200 words or less)</p> <p>AREVA Enrichment Services LLC (AES) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for a license to construct, operate, and decommission the proposed Eagle Rock Enrichment Facility (EREF) near Idaho Falls in Bonneville County, Idaho. If licensed, the proposed facility would enrich uranium for use in commercial nuclear fuel for power reactors. Feed material would be non-enriched uranium hexafluoride (UF<sub>6</sub>). AES would employ a gas centrifuge process to enrich uranium up to 5 percent uranium-235 by weight, with a planned maximum target production of 6.6 million separative work units (SWUs) per year. The proposed EREF would be licensed in accordance with the provisions of the Atomic Energy Act. Specifically, an NRC license under Title 10, "Energy," of the U.S. Code of Federal Regulations (10 CFR) Parts 30, 40, and 70 would be required to authorize AES to possess and use special nuclear material, source material, and byproduct material at the proposed EREF site.</p> <p>This Environmental Impact Statement (EIS) was prepared in compliance with the National Environmental Policy Act (NEPA) and the NRC regulations for implementing NEPA (10 CFR Part 51). This EIS evaluates the potential environmental impacts of the proposed action and its reasonable alternatives.</p>					
<p>12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)</p> <p>EIS for the Proposed Eagle Rock Enrichment Facility in Bonneville County, Idaho Uranium Enrichment Facility NUREG-1945 National Environmental Policy Act NEPA EREF AREVA Enrichment Services LLC AES AREVA</p>	<p>13. AVAILABILITY STATEMENT</p> <p style="text-align: center;">unlimited</p> <p>14. SECURITY CLASSIFICATION</p> <p>(This Page) unclassified</p> <p>(This Report) unclassified</p> <p>15. NUMBER OF PAGES</p> <p>16. PRICE</p>				



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NUREG-1945, Vol. 2

# **Environmental Impact Statement for the Proposed Eagle Rock Enrichment Facility in Bonneville County, Idaho**

Final Report

Appendices A through I

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# **Environmental Impact Statement for the Proposed Eagle Rock Enrichment Facility in Bonneville County, Idaho**

## **Final Report**

## **Appendices A through I**

Manuscript Completed: February 2011  
Date Published: February 2011



1  
2  
3 **ABSTRACT**

4 On December 30, 2008, AREVA Enrichment Services LLC (AES) submitted an application to  
5 the U.S. Nuclear Regulatory Commission (NRC) for a license to construct, operate, and  
6 decommission the proposed Eagle Rock Enrichment Facility (EREF). The proposed EREF  
7 would be located in Bonneville County, Idaho, approximately 32 kilometers (20 miles) west of  
8 Idaho Falls. Revisions to the license application were submitted by AES on April 23, 2009, and  
9 April 30, 2010. If licensed, the proposed facility would enrich uranium for use in commercial  
10 nuclear fuel for power reactors. AES would employ a gas centrifuge enrichment process to  
11 enrich uranium to up to five percent uranium-235 by weight, with a planned maximum target  
12 production of 6.6 million separative work units (SWUs) per year. AES initiated preconstruction  
13 activities (e.g., site preparation) in late 2010 under an exemption approved by the NRC to  
14 conduct such activities prior to licensing. If its license application is approved, AES expects to  
15 begin facility construction in 2011 and commence initial production in 2014, reaching peak  
16 production in 2022. AES's license would be for a term of 30 years. Prior to license expiration in  
17 2041, AES would seek to renew its license to continue operating the proposed facility or plan for  
18 the decontamination and decommissioning of the proposed facility per the applicable licensing  
19 conditions and NRC regulations. The proposed EREF would be licensed in accordance with the  
20 provisions of the *Atomic Energy Act*. Specifically, an NRC license under Title 10, "Energy," of  
21 the U.S. *Code of Federal Regulations* (10 CFR) Parts 30, 40, and 70 would be required to  
22 authorize AES to possess and use special nuclear material, source material, and byproduct  
23 material at the proposed EREF site.

24 This Environmental Impact Statement (NUREG-1945) (EIS) was prepared in compliance with  
25 the *National Environmental Policy Act of 1969*, as amended (NEPA), and the NRC regulations  
26 for implementing NEPA (10 CFR Part 51). This EIS evaluates the potential environmental  
27 impacts of preconstruction activities and of the proposed action, which is to construct, operate,  
28 and decommission the proposed EREF near Idaho Falls in Bonneville County, Idaho. Also, this  
29 EIS describes the environment potentially affected by AES's proposal, evaluates reasonable  
30 alternatives to the proposed action, describes AES's environmental monitoring program and  
31 mitigation measures, and evaluates the costs and benefits of the proposed action.

32  
33 **Paperwork Reduction Act Statement**  
34

35 This NUREG contains and references information collection requirements that are subject to the  
36 Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were  
37 approved by the Office of Management and Budget, approval numbers 3150-0014, 3150-0017,  
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## EXECUTIVE SUMMARY

### BACKGROUND

Under the provisions of the *Atomic Energy Act* and pursuant to Title 10 of the U.S. *Code of Federal Regulations* (10 CFR) Parts 30, 40, and 70, the U.S. Nuclear Regulatory Commission (NRC) is considering whether to issue a license that would allow AREVA Enrichment Services, LLC (AES) to possess and use byproduct material, source material, and special nuclear material at a proposed gas centrifuge uranium enrichment facility near Idaho Falls in Bonneville County, Idaho, for a period of 30 years. The scope of activities to be conducted under the license would include the construction, operation, and decommissioning of the proposed Eagle Rock Enrichment Facility (EREF). The application for the license was filed with the NRC by AES by letter dated December 30, 2008. Revisions to the license application were submitted by AES on April 23, 2009 (Revision 1) and April 30, 2010 (Revision 2). To support its licensing decision on AES's proposed EREF, the NRC determined that the NRC's implementing regulations in 10 CFR Part 51 for the *National Environmental Policy Act* (NEPA) require the preparation of an Environmental Impact Statement (EIS). The development of this EIS is based on the NRC staff's review of information provided by AES, independent analyses, and consultations with the U.S. Fish and Wildlife Service and other Federal agencies, Native American tribes, the Idaho State Historic Preservation Office (SHPO) and other State agencies, and local government agencies.

The enriched uranium produced at the proposed EREF would be used to manufacture nuclear fuel for commercial nuclear power reactors. Enrichment is the process of increasing the concentration of the naturally occurring and fissionable uranium-235 isotope. Uranium ore usually contains approximately 0.72 weight percent uranium-235. To be useful in light-water nuclear power plants as fuel for electricity generation, the uranium must be enriched up to 5 weight percent uranium-235.

### THE PROPOSED ACTION

The proposed action considered in this EIS is for AES to construct, operate, and decommission a uranium enrichment facility, the proposed EREF, at a site near Idaho Falls in Bonneville County, Idaho. To allow the proposed action to take place, the NRC would issue a license to AES as discussed above. The proposed EREF would be located on a 186-hectare (460-acre) section of a 1700-hectare (4200-acre) parcel of land that it intends to purchase from a single private landowner. Current land uses of the proposed EREF property include native rangeland, nonirrigated seeded pasture, and irrigated cropland. The proposed EREF, if approved, would be situated on the north side of US 20, about 113 kilometers (70 miles) west of the Idaho/Wyoming State line and approximately 32 kilometers (20 miles) west of Idaho Falls. The eastern boundary of the U.S. Department of Energy's (DOE) Idaho National Laboratory (INL) is 1.6 kilometers (1 mile) west of the proposed property. The lands north, east, and south of the proposed property are a mixture of private-, Federal-, and State-owned parcels, with the Federal lands managed by the Bureau of Land Management (BLM).

Using a gas centrifuge process, the proposed EREF would produce uranium enriched up to 5 percent by weight in the isotope uranium-235, with a planned maximum target production of 6.6 million separative work units (SWUs) per year. An SWU is a unit of measurement used in the nuclear industry, pertaining to the process of enriching uranium for use as fuel for nuclear

1 power plants. If the license is approved, facility construction would begin in 2011 with heavy  
2 construction (construction of all major buildings and structures) continuing for 7 years into 2018.  
3 The proposed EREF would begin initial production in 2014 and reach peak production in 2022.  
4 Operations would continue at peak production until approximately 9 years before the license  
5 expires. Decommissioning activities would then begin and be completed by 2041.  
6 Decommissioning would involve the sequential shutdown of the 4 Separation Building Modules  
7 (SBMs) resulting in a gradual decrease in production. Each SBM would take approximately  
8 4.5 years to decommission.

9  
10 Supplemental information on a proposed 161-kilovolt (kV) electrical transmission line required to  
11 power the proposed EREF was submitted by AES on February 18, 2010. The NRC has no  
12 jurisdiction over transmission lines; therefore, the transmission line for the proposed EREF is  
13 not considered part of the proposed action. However, construction and operation of this  
14 transmission line are considered in this EIS under cumulative impacts.

### 15 16 **NRC EXEMPTION FOR AES TO CONDUCT CERTAIN PRECONSTRUCTION ACTIVITIES**

17  
18 On June 17, 2009, AES submitted a request for an exemption from certain NRC regulations to  
19 allow commencement of certain preconstruction activities on the proposed EREF site prior to  
20 NRC's decision to issue a license for the construction, operation, and decommissioning of the  
21 proposed EREF. On March 17, 2010, the NRC granted an exemption authorizing AES to  
22 conduct the requested preconstruction activities. Under the exemption, these preconstruction  
23 activities are not considered by the NRC as part of the proposed action, although the  
24 environmental impacts of these activities are discussed in this EIS along with the impacts of  
25 facility construction.

26  
27 Specifically, the exemption covers the following activities and facilities:

- 28 • clearing of approximately 240 hectares (592 acres) for the proposed EREF
- 29 • site grading and erosion control
- 30 • excavating the site including rock blasting and removal
- 31 • constructing a stormwater retention pond
- 32 • constructing main access and site roadways
- 33 • installing utilities
- 34 • erecting fences for investment protection
- 35 • constructing parking areas
- 36 • erecting construction buildings, offices (including construction trailers), warehouses, and  
37 guardhouses

1 This exemption authorizes AES to conduct the stated activities, provided that none of the  
2 facilities or activities subject to the exemption would be components of AES's Physical Security  
3 Plan or its Standard Practice Procedures Plan for the Protection of Classified Matter, or  
4 otherwise be subject to NRC review or approval. AES initiated preconstruction activities in late  
5 2010.

## 7 **PURPOSE OF AND NEED FOR THE PROPOSED ACTION**

9 The purpose of the proposed action would be to allow AES to construct, operate, and  
10 decommission a facility using gas centrifuge technology to enrich uranium up to 5 percent by  
11 weight of uranium-235, with a production capacity of 6.6 million SWU per year, at the proposed  
12 EREF near Idaho Falls in Bonneville County, Idaho. This facility would contribute to the  
13 attainment of national energy security policy objectives by providing an additional reliable and  
14 economical domestic source of low-enriched uranium to be used in commercial nuclear power  
15 plants.

17 Nuclear power currently supplies approximately 20 percent of the nation's electricity. The  
18 United States Enrichment Corporation Paducah Gaseous Diffusion Plant, Paducah, Kentucky, is  
19 currently the primary U.S. supplier of low-enriched uranium for nuclear fuel in the United States.  
20 However, the URENCO USA facility (formerly known as the National Enrichment Facility) in Lea  
21 County, New Mexico, which began initial operations in June 2010, may provide additional  
22 enrichment services in the future as construction continues on its remaining cascade halls. The  
23 American Centrifuge Plant (ACP) in Piketon, Ohio, which is currently under construction, and  
24 the proposed Global Laser Enrichment (GLE) Facility in Wilmington, North Carolina, for which  
25 the NRC is currently reviewing its license application, may also provide additional domestic  
26 enrichment services in the future. The existing operating Paducah, Kentucky, enrichment plant  
27 supplies approximately 15 percent of the current U.S. demand for low-enriched uranium. The  
28 United States Enrichment Corporation also imports downblended (diluted) weapons-grade  
29 uranium from Russia through the Megatons to Megawatts Program to supply an additional  
30 38 percent of the U.S. demand. The remaining 47 percent of low-enriched uranium is imported  
31 from foreign suppliers. The current primary dependence on a single U.S. supplier and foreign  
32 sources for low-enriched uranium imposes reliability risks for the nuclear fuel supply to  
33 U.S. nuclear power plants. National energy policy emphasizes the importance of having a  
34 reliable domestic source of enriched uranium for national energy security. The production of  
35 enriched uranium at the proposed EREF would be equivalent to about 40 percent of the current  
36 and projected demand (15 to 16 million SWUs) for enrichment services within the United States.

## 38 **ALTERNATIVES TO THE PROPOSED ACTION**

40 In this EIS, the NRC staff considered a reasonable range of alternatives to the proposed action,  
41 including alternative sites for an AES enrichment facility, alternative sources of low-enriched  
42 uranium, alternative technologies for uranium enrichment, and the no-action alternative. Two of  
43 the alternatives, the proposed action and the no-action alternative, were analyzed in detail. The  
44 approved preconstruction activities discussed earlier are assumed to occur prior to NRC's  
45 decision to grant a license to AES and, therefore, are assumed to occur under both the  
46 proposed action and the no-action alternative.

1 Under the no-action alternative, the proposed EREF would not be constructed, operated, and  
2 decommissioned in Bonneville County, Idaho. Uranium enrichment services would continue to  
3 be performed by existing domestic and foreign uranium enrichment suppliers. However,  
4 URENCO USA would provide and the ACP and potentially the proposed GLE Facility may  
5 provide enrichment services in the future.  
6

7 AES considered 44 alternative sites throughout the United States. AES evaluated these sites  
8 based on various technical, safety, economic, and environmental selection criteria, and  
9 concluded that the Eagle Rock site in Bonneville County, Idaho, met all of the criteria. The NRC  
10 staff reviewed AES's site-selection process and results to determine if any site considered by  
11 AES was obviously superior to the proposed Eagle Rock site. The NRC staff determined that  
12 the process used by AES was rational and objective, and that its results were reasonable.  
13 Based on its review, the NRC staff concluded that none of the candidate sites were obviously  
14 superior to the AES preferred site in Bonneville County, Idaho.  
15

16 The NRC staff examined three alternatives to satisfy domestic enrichment needs: (1) reactivate  
17 the Portsmouth Gaseous Diffusion Plant near Piketon, Ohio; (2) downblend highly enriched  
18 uranium instead of constructing a domestic uranium enrichment facility; and (3) purchase low-  
19 enriched uranium from foreign sources. These alternatives were eliminated from further  
20 consideration based on concerns related to reliability, excessive energy consumption, and  
21 national energy security, and did not meet national energy policy objectives involving the need  
22 for a reliable, economical source of domestic uranium enrichment.  
23

24 The NRC staff also evaluated alternative technologies to the gas centrifuge process:  
25 electromagnetic isotope separation, liquid thermal diffusion, gaseous diffusion, Atomic Vapor  
26 Laser Isotope Separation, Molecular Laser Isotope Separation, and separation of isotopes by  
27 laser excitation. These technologies were eliminated from further consideration based on  
28 factors such as the technology immaturity, economic impracticality, or exclusive licensing.  
29

30 In addition, the NRC staff considered conversion and disposition methods for depleted uranium  
31 hexafluoride (UF<sub>6</sub>): (1) beneficial use of depleted UF<sub>6</sub>, and (2) conversion at facilities other than  
32 the new facilities that the U.S. Department of Energy (DOE) has built at Portsmouth and  
33 Paducah. For the purposes of this analysis, because the current available inventory of depleted  
34 uranium exceeds the current and projected future demand for the material, the depleted UF<sub>6</sub>  
35 generated by the proposed EREF was considered a waste product, and disposition alternatives  
36 involving its use as a resource were not further evaluated.  
37

38 Existing fuel fabrication facilities have not expressed an interest in performing depleted UF<sub>6</sub>  
39 conversion services, and the cost for the services would be difficult to estimate; therefore, this  
40 alternative was eliminated from further consideration. However, International Isotopes, Inc.  
41 submitted a license application to the NRC on December 31, 2009, to construct and operate a  
42 depleted UF<sub>6</sub> conversion facility near Hobbs, New Mexico. On February 23, 2010, the NRC  
43 staff accepted the license application, and has initiated a formal safety and environmental  
44 review.  
45  
46

1 **POTENTIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION**

2  
3 This EIS evaluates the potential environmental impacts of the proposed action. A standard of  
4 significance has been established for assessing environmental impacts. Following the Council  
5 on Environmental Quality’s regulations in 40 CFR 1508.27, the NRC staff has assigned each  
6 impact one of the following three significance levels:

- 7
- 8 • SMALL. The environmental effects are not detectable or are so minor that they would  
9 neither destabilize nor noticeably alter any important attribute of the resource.
  - 10
  - 11 • MODERATE. The environmental effects are sufficient to noticeably alter but not destabilize  
12 important attributes of the resource.
  - 13
  - 14 • LARGE. The environmental effects are clearly noticeable and are sufficient to destabilize  
15 important attributes of the resource.
  - 16

17 As described in Chapter 4, the environmental impacts of preconstruction and the proposed  
18 action would mostly be SMALL. Some potential impacts would be SMALL to MODERATE or  
19 MODERATE in a few cases; and there would be LARGE, though intermittent, short-term  
20 impacts in one resource area during preconstruction. Methods for mitigating the potential  
21 impacts are identified in Chapters 4 and 5. Environmental measurement and monitoring  
22 methods are described in Chapter 6.

23  
24 Summarized below are the potential environmental impacts of the proposed action on each of  
25 the resource areas considered in this EIS. Each summary is preceded by the impact  
26 significance level for the respective resource areas.

27  
28 **Land Use**

29  
30 SMALL. The construction of a uranium enrichment facility would alter the current land use,  
31 which consists primarily of agriculture and undeveloped rangeland. The 240-hectare (592-acre)  
32 proposed EREF site under consideration would be located entirely on a 1700-hectare  
33 (4200-acre) private parcel of land. Bonneville County has zoned the location as G-1, Grazing,  
34 which allows for industrial development, and is intended to allow certain activities that should be  
35 removed from population centers in the county. The operation of a uranium enrichment facility  
36 is consistent with the county’s zoning. It is not anticipated that construction and operation of the  
37 proposed EREF would have any effect on the current land uses found on the surrounding public  
38 lands managed by the BLM.

39  
40 Restrictions to land use would begin with the purchase of the proposed property by AES. The  
41 alteration of land use would begin during preconstruction and continue during construction.  
42 Preconstruction activities would result in the alteration of the land as a result of activities such  
43 as land clearing and grading, restricted access to the proposed EREF property, and cessation  
44 of agricultural uses (grazing and crop production). The majority of impacts to land use would  
45 occur during preconstruction. However, since large land areas in the county will continue to be  
46 used for grazing and crop production, including the BLM-managed lands surrounding the  
47 proposed EREF property, land use impacts resulting from preconstruction and construction  
48 would be SMALL.



1 Operation of the proposed EREF would restrict land use on the proposed property to the  
2 production of enriched uranium. The operation of the proposed EREF is not expected to alter  
3 land use on adjacent properties. Impacts on land use due to operations would be SMALL.  
4

5 At the end of decommissioning, the buildings and structures would be available for unrestricted  
6 use. As a result, impacts on land use due to decommissioning would be SMALL.  
7

## 8 **Historic and Cultural Resources**

9  
10 SMALL TO MODERATE. Impacts to historic and cultural resources would occur primarily  
11 during preconstruction. Construction would take place on ground previously disturbed by  
12 preconstruction activities. There are 13 cultural resource sites (3 prehistoric, 6 historic, and  
13 4 multi-component) in the surveyed areas of the proposed EREF property. One of these sites,  
14 the John Leopard Homestead (MW004), is located within the footprint of the proposed EREF,  
15 and has been recommended as eligible for the *National Register of Historic Places*. Site  
16 MW004 would be destroyed by preconstruction activities. However, AES mitigated impacts to  
17 site MW004 prior to land disturbance through professional excavation and data recovery, and  
18 other similar homestead site types exist in the region. Therefore, the impact to site MW004  
19 would be limited to a MODERATE level.  
20

21 Construction and operation of the proposed EREF would be unlikely to result in visual or noise  
22 impacts on the Wasden Complex, an important group of archaeological sites, because it is  
23 located approximately 1.6 kilometers (1.0 mile) from the proposed EREF site and sits behind a  
24 ridge that partially blocks the view. Other impacts during operations would be SMALL because  
25 no intact historic or cultural resources would remain.  
26

27 Decommissioning would not likely affect historic and cultural resources because any areas  
28 disturbed during decommissioning would have been previously disturbed during preconstruction  
29 and construction. Therefore, impacts would be SMALL.  
30

## 31 **Visual and Scenic Resources**

32  
33 SMALL TO MODERATE. Impacts to visual and scenic resources result when contrasts are  
34 introduced into a visual landscape. The proposed project site and surrounding areas consist  
35 primarily of sagebrush semi-desert to the north, east, and west of the proposed site. The  
36 proposed facility would be located approximately 2.4 kilometers (1.5 miles) from areas of public  
37 view, including US 20 and the Hell's Half Acre Wilderness Study Area (WSA) to the south which  
38 contains the remains of a 4000-year-old lava flow. The BLM gave a Visual Resource  
39 Management (VRM) Class I designation to the WSA, which applies to areas of high scenic  
40 quality.  
41

42 Visual impacts during preconstruction could result along US 20 from increased activity at the  
43 proposed site and fugitive dust, but these would be of a relatively short duration. The clearing of  
44 vegetation and installation of a perimeter fence would change the visual setting; however, they  
45 would not drastically alter the overall appearance of the area. Impacts on visual and scenic  
46 resources due to preconstruction would be SMALL.  
47



1 Construction of the proposed EREF would introduce visual intrusions that are out of character  
2 with the surrounding area. While initial construction activities would commence on a cleared  
3 area, such a view is not very intrusive on the visual landscape. Similarly, fugitive dust  
4 generated during the construction period would be of a temporary nature and cause minimal  
5 disturbance to the viewshed. However, because of the extent of the proposed EREF project,  
6 the type and size of equipment involved in construction, and the industrial character of buildings  
7 to be built, construction of the proposed EREF would create significant contrast with the  
8 surrounding visual environment, which is predominantly rangeland and cropland. Thus, visual  
9 impact levels associated with construction would range from SMALL to MODERATE.

10  
11 Construction and operation of the proposed EREF would be unlikely to result in visual impacts  
12 on the Wasden Complex due to its distance from the proposed EREF site and location behind a  
13 ridgeline that obscures views of the lower portions of the proposed facility. However, operations  
14 would have an impact on the surrounding visual landscape. The proposed facility is visually  
15 inconsistent with the current setting, and its operation is expected to alter the visual rating on  
16 surround public lands, which would be a MODERATE visual impact. Also, plant lighting at night  
17 could be perceivable at the trailhead of the Hell's Half Acre WSA, although probably not from  
18 the Craters of the Moon National Park located 72 kilometers (45 miles) to the west of the  
19 proposed EREF site.

20  
21 At the end of decommissioning, the buildings and structures would be available for unrestricted  
22 use. As a result, impacts on visual and scenic resources would remain MODERATE.

## 23 24 **Air Quality**

25  
26 SMALL to LARGE. Air emissions during preconstruction and construction would include fugitive  
27 dust from heavy equipment working on the proposed site, engine emissions from construction  
28 equipment onsite and vehicles transporting workers and materials to the proposed site, and  
29 emissions from diesel-fueled generators. The generators, although not intended to provide  
30 power for construction activities, would be operated weekly for preventative maintenance.  
31 During preconstruction, fugitive dust from land clearing and grading operations would result in  
32 large releases of particulate matter. Such impacts would be MODERATE to LARGE during  
33 certain preconstruction periods and activities that would be temporary and brief in duration.  
34 Otherwise, impacts on ambient air quality from preconstruction would be SMALL for all  
35 hazardous air pollutants (HAPs) and all criteria pollutants except particulates. Air quality  
36 impacts during construction would be SMALL for all HAPs and all criteria pollutants.

37  
38 During operations, the proposed EREF would not be a major source of air emissions, although  
39 there is a potential for small gaseous releases associated with operation of the process that  
40 could contain UF<sub>6</sub>, hydrogen fluoride (HF), and uranyl fluoride (UO<sub>2</sub>F<sub>2</sub>). Also, small amounts of  
41 nonradioactive air emissions consisting of carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>),  
42 particulate matter (PM), volatile organic compounds (VOCs), and sulfur dioxide (SO<sub>2</sub>) would be  
43 released:

- 44 • from the auxiliary diesel electric generators to supply electrical power when power from the  
45 utility grid is not available
- 46
- 47 • during building and equipment maintenance activities
- 48

- 1 • from trucks, automobiles, and other vehicles in use onsite

2  
3 Air emissions are not expected to impact regional visibility. Ambient air modeling predicts that  
4 impacts on ambient air quality from the routine operation of the proposed EREF would be  
5 SMALL with respect to all criteria pollutants and all HAPs.

6  
7 During decommissioning, impacts would result from emissions including fugitive dust (mitigated  
8 by dust suppression work practices) and CO, NO<sub>x</sub>, PM, VOCs, and SO<sub>2</sub> from transportation  
9 equipment and would be SMALL.

## 10 11 **Geology and Soils**

12  
13 SMALL. Impacts on about 240 hectares (592 acres) of land would occur primarily during  
14 preconstruction, as a result of soil-disturbing activities (blasting, excavating, grading, and other  
15 activities) that loosen soil and increase the potential for erosion. Because these impacts are  
16 short-term and can be mitigated, impacts on geology and soils would be SMALL. Construction  
17 activities could cause short-term impacts such as an increase in soil erosion at the proposed  
18 site. Soil erosion could result from wind action and rain, although rainfall in the vicinity of the  
19 proposed site is low. Compaction of soils due to heavy vehicle traffic would increase the  
20 potential for soil erosion via runoff. Impacts would be SMALL.

21  
22 Impacts on soils during operations at the proposed facility would also be SMALL because  
23 activities would not increase the potential for soil erosion beyond that for the surrounding area.  
24 The impacts to soil quality from atmospheric deposition of pollutants during operations would be  
25 SMALL.

26  
27 Land disturbance associated with decommissioning could temporarily increase the potential for  
28 soil erosion at the proposed EREF site, resulting in impacts similar to (but less than) those  
29 during the preconstruction/construction phase. As a result, impacts to soils due to  
30 decontamination and decommissioning activities would be SMALL.

## 31 32 **Water Resources**

33  
34 SMALL. During preconstruction and construction, stormwater runoff would be diverted to a  
35 stormwater detention basin, thus the potential for contaminated stormwater discharging to water  
36 bodies on adjacent properties is low. No surface water sources would be used. Natural surface  
37 water bodies are absent within and near the proposed EREF site, and groundwater occurs at  
38 depths of 202 meters (661 feet) to 220 meters (722 feet). Annual maximum groundwater usage  
39 rates from the Eastern Snake River Plain (ESRP) aquifer in Bonneville County during  
40 preconstruction and construction comprise about 16 percent of the annual water right  
41 appropriation that has been transferred to the proposed property for use as industrial water.  
42 Therefore, impacts on surface water quality, the regional water supply, and groundwater quality  
43 during preconstruction and construction would be SMALL.

44  
45 Water usage rates during operations would remain well within the water right appropriation.  
46 Both average and peak annual water use requirements would be less than 1 percent of the total  
47 groundwater usage from the ESRP aquifer. No process effluents would discharge to the  
48 retention or detention basins or into surface water. Therefore, liquid effluents would have a

1 SMALL impact on water resources. Because all the water discharged to the Cylinder Storage  
2 Pads Stormwater Retention Basins would evaporate, the basins would have a SMALL impact  
3 on the quality of water resources. The site Stormwater Detention Basin seepage would also  
4 have a SMALL impact on water resources of the area because no wastewater would be  
5 discharged to the basin.  
6

7 Since the usage and discharge impacts to water resources during the decommissioning phase  
8 would be similar to those during construction, the impacts to water resources would remain  
9 SMALL.

## 10 11 **Ecological Resources**

12  
13 SMALL TO MODERATE. Preconstruction activities such as land clearing could result in direct  
14 impacts due to habitat loss and wildlife mortality as well as indirect impacts to ecological  
15 resources in surrounding areas, primarily from fugitive dust and wildlife disturbance.  
16 Approximately 75 hectares (185 acres) of sagebrush steppe habitat and 55 hectares  
17 (136 acres) of nonirrigated pasture would be eliminated. Impacts on plant communities and  
18 wildlife from preconstruction would be MODERATE. Construction activities that could impact  
19 ecological resources include constructing the proposed UF<sub>6</sub> storage pads and EREF buildings.  
20 However, most construction activities would occur in areas that would have already been  
21 disturbed by preconstruction activities. Impacts on vegetation would occur primarily from any  
22 additional vegetation clearing. Impacts would include the generation of fugitive dust, spread of  
23 invasive species, changes in drainage patterns, soil compaction, erosion of disturbed areas,  
24 potential sedimentation of downgradient habitats, and accidental releases of hazardous or toxic  
25 materials (e.g., fuel spills). These activities could also result in some wildlife mortality and would  
26 cause other wildlife to relocate as a result of noise, lighting, traffic, and human presence.  
27 Collisions with construction equipment and other vehicles may cause some wildlife mortality.  
28 No rare or unique plant communities, or threatened or endangered species, have been found or  
29 are known to occur on the proposed site, although habitat on the proposed property is known to  
30 be used by greater sage-grouse (a Federal candidate species). Construction (and  
31 preconstruction) activities are not expected to result in population-level impacts on any  
32 Federally listed or State-listed species, which the U.S. Fish and Wildlife Service has stated are  
33 not present on the proposed EREF property. Impacts of construction of the proposed facility  
34 would be SMALL.  
35

36 Operation of the proposed EREF could result in impacts on wildlife and plant communities as a  
37 result of noise, lighting, traffic, human presence, air emissions, and retention/detention ponds.  
38 However, these impacts would be SMALL.  
39

40 Vegetation and wildlife that became established near the proposed facility could be affected by  
41 decommissioning activities. Impacts during decommissioning would be similar to those during  
42 construction and would be SMALL.  
43

## 44 **Noise**

45  
46 SMALL. Most of the major noise-producing activities (site clearing and grading, excavations  
47 [including the use of explosives], utility burials, construction of onsite roads [including the US 20  
48 interchanges], and construction of the ancillary buildings and structures) would occur during

1 preconstruction. Noise impacts from initial preconstruction activities may exceed established  
2 standards at some locations along the proposed EREF property boundary for relatively short  
3 periods of time. However, because of the distances involved, expected levels of attenuation,  
4 application of mitigation measures, and the expected limited presence of human receptors at  
5 these locations, the impacts of noise during preconstruction would be SMALL for human  
6 receptors. The nearest resident is located approximately 7.7 kilometers (4.8 miles) east of the  
7 proposed site. No residence is expected to experience unacceptable noise levels during  
8 construction. Noise impacts from construction may exceed established standards at some  
9 offsite locations for relatively short periods of time. However, because of the distances involved,  
10 expected levels of attenuation, and AES's commitment to appropriate mitigations, the impacts  
11 would be SMALL for human receptors. During the overlap period when partial operations begin  
12 while building construction continues, noise impacts from construction and operation are  
13 expected to be additive, but still substantially reduced from noise levels during initial  
14 construction.

15  
16 Major noise sources associated with facility operation include the six diesel-fueled emergency  
17 generators, commuter traffic, the movement of delivery vehicles, and operation of various  
18 pumps, compressors, and cooling fans. Operational noise estimates at the proposed property  
19 boundary satisfy all relevant or potentially relevant U.S. noise standards and guidance.  
20 Residents in the vicinity of US 20, who would otherwise be unaffected by noise from the  
21 proposed EREF industrial footprint, would be impacted by slightly increased traffic noise. Noise  
22 impacts from proposed EREF operation would be SMALL.

23  
24 Noise sources and levels during decommissioning would be similar to those during construction,  
25 and peaking noise levels would be expected to occur for short durations. As a result, noise  
26 impacts from decommissioning would be SMALL.

27  
28 **Transportation**

29  
30 SMALL TO MODERATE. Preconstruction activities for the proposed EREF would cause an  
31 impact on the local transportation network due to the construction of highway entrances, the  
32 daily commute of workers, daily construction deliveries, and waste shipments. Traffic  
33 slowdowns or delays would only be expected to occur at the entrance to the proposed EREF  
34 during access road construction and shift changes; the impacts on overall traffic patterns and  
35 volumes would be MODERATE on US 20 and SMALL on Interstate 15 (I-15). The primary  
36 impact would be increased traffic on nearby roads. Impacts during construction would occur  
37 from transportation of personnel, construction materials, and nonradiological waste. All traffic to  
38 and from the proposed EREF during preconstruction and construction would use US 20.  
39 Construction activities at the proposed EREF site could result in a 55 percent increase in traffic  
40 volume on US 20 (including the period when construction and operations overlap). Because  
41 traffic volume is expected to remain below the design capacity of I-15 and traffic slowdowns or  
42 delays would only be expected to occur at the entrance to the proposed EREF during shift  
43 changes, the impacts on overall traffic patterns and volumes during construction would be  
44 SMALL to MODERATE on US 20 and SMALL on I-15. For the most part, the impacts from the  
45 truck traffic to and from the proposed site during construction would be SMALL.

46  
47 Operations impacts would occur from the transport of personnel, nonradiological materials, and  
48 radioactive material to and from the proposed EREF, especially during the period when

1 construction and operation overlap. Increased traffic during facility operation would have a  
2 SMALL to MODERATE impact on the current traffic on US 20 (SMALL for any off-peak shift  
3 change). The impacts of truck traffic to and from the proposed site during operation would be  
4 SMALL. Annual transportation routine impacts and accident risks (radiological and chemical)  
5 would be SMALL.  
6

7 Traffic during the initial portion of the decommissioning would be approximately the same as for  
8 the period when construction and operations overlap. Traffic after the cessation of operations  
9 would be less than during either construction or operation. Impacts on local traffic on US 20  
10 would be SMALL to MODERATE.  
11

## 12 **Public and Occupational Health**

13

14 SMALL. During preconstruction, impacts on occupational safety resulting from injuries,  
15 illnesses, and exposures to fugitive dust, pollutants, and vapors would be SMALL, based on  
16 estimates of the number of incidents. During construction, nonradiological impacts could  
17 include injuries and illnesses incurred by workers and impacts due to exposure to chemicals or  
18 other nonradiological substances. All such potential impacts would be SMALL because all  
19 activities would take place under typical construction workplace safety regulations. No  
20 radiological impacts are expected during facility construction.  
21

22 Nonradiological impacts during facility operation include worker illnesses and injuries and  
23 impacts from worker or public exposure to hazardous chemicals used or present during  
24 operations, mainly uranium and HF. Due to low estimated concentrations of uranium and HF at  
25 public (proposed property boundary) and workplace receptor locations, nonradiological impacts  
26 due to exposures to hazardous chemicals (including uranium and HF) during operations would  
27 be SMALL.  
28

29 Assessment of potential radiological impacts from facility operations considers both public and  
30 occupational exposures to radiation, and includes exposures to workers completing the facility  
31 construction during initial phases of operation. Exposure pathways include inhalation of  
32 airborne contaminants, ingestion of contaminated food crops, direct exposure from material  
33 deposited on the ground, and external exposure associated with the stored UF<sub>6</sub> cylinders.  
34 Impacts from exposure of members of the public would be SMALL. Worker exposures would  
35 vary by job type, but would be carefully monitored and maintained as low as reasonably  
36 achievable (ALARA) and impacts would be SMALL.  
37

38 For a hypothetical individual member of the public at the proposed EREF property boundary and  
39 the nearest resident, the maximum annual total effective dose equivalents would be 0.014  
40 millisievert per year (1.4 millirem per year) and  $2.1 \times 10^{-6}$  millisievert per year ( $2.1 \times 10^{-4}$  millirem  
41 per year), respectively. Dose equivalents attributable to operation of the proposed EREF would  
42 be small compared to the normal background radiation range of 2.0 to 3.0 millisieverts (200 to  
43 300 millirem) dose equivalent. This equates to radiological impacts during proposed EREF  
44 operation that would be SMALL.  
45

46 The nature of decommissioning activities would be similar to that during construction and  
47 operation. Impacts from occupational injuries and illnesses and chemical exposures would be  
48 SMALL. Occupational radiological exposures would be bounded by the potential exposures



1 during operation, because the quantities of uranium material handled would be less than or  
2 equal to that during operations. An active environmental monitoring and dosimetry (external  
3 and internal) program would be conducted to maintain ALARA doses to workers and to  
4 individual members of the public. Therefore, the impacts of decommissioning on public and  
5 occupational health would be SMALL.

## 6 7 **Waste Management**

8  
9 SMALL. Solid nonhazardous wastes generated during preconstruction would be transported  
10 offsite to an approved local landfill. Hazardous wastes (e.g., waste oil, greases, excess paints,  
11 and other chemicals) generated during preconstruction would be packaged and shipped offsite  
12 to a licensed treatment, storage, and disposal facility (TSDF). Impacts from nonhazardous solid  
13 waste and hazardous waste generation during preconstruction would be SMALL due to the  
14 available current or future capacity at local and regional disposal facilities. Construction would  
15 generate about 6116 cubic meters (8000 cubic yards) of nonhazardous solid waste per year, not  
16 including recyclable materials such as scrap structural steel, sheet metal, and piping. About  
17 23,000 liters (6200 gallons) and 1000 kilograms (2200 pounds) of hazardous waste would be  
18 generated annually. The impacts of nonhazardous and hazardous waste generation during  
19 construction would be SMALL due to the available current or future capacity at local and  
20 regional disposal facilities.

21  
22 During operation, approximately 70,307 kilograms (154,675 pounds) of industrial,  
23 nonhazardous, nonradioactive solid waste and approximately 146,400 kilograms  
24 (322,080 pounds) of low-level radioactive waste (not including depleted UF<sub>6</sub>) are expected to be  
25 generated annually. The proposed facility would also generate approximately 5062 kilograms  
26 (11,136 pounds) of hazardous wastes and 100 kilograms (220 pounds) of mixed waste  
27 annually. All wastes would be transferred to offsite licensed waste disposal facilities with  
28 suitable disposal capacity. The impacts of this waste generation would be SMALL.

29  
30 During peak operation, the proposed EREF is expected to generate 1222 cylinders of depleted  
31 UF<sub>6</sub> annually, which would be temporarily stored on an outdoor cylinder storage pad in  
32 approved Type 48Y containers before being transported to a DOE-owned or private conversion  
33 facility. Storage of uranium byproduct cylinders at the proposed EREF would occur for the  
34 duration of, but not beyond, the proposed facility's 30-year operating lifetime. The impacts from  
35 temporary storage of depleted UF<sub>6</sub>, from the conversion of depleted UF<sub>6</sub> to U<sub>3</sub>O<sub>8</sub> at an offsite  
36 location, and from the transportation of the U<sub>3</sub>O<sub>8</sub> conversion product to a potential disposal site  
37 would be SMALL.

38  
39 During decommissioning, radioactive material from decontamination of contaminated equipment  
40 would be packaged and shipped offsite for disposal. Wastes to be disposed would include  
41 7700 cubic meters (10,070 cubic yards) of low-level radioactive waste. Due to the availability of  
42 adequate disposal capacity, waste management impacts would be SMALL.

## 43 44 **Socioeconomics**

45  
46 SMALL. Employment and income impacts were evaluated using an 11-county ROI in Idaho –  
47 including Bannock, Bingham, Blaine, Bonneville, Butte, Caribou, Clark, Fremont, Jefferson,  
48 Madison, and Power Counties. Wage and salary spending and expenditures associated with



1 materials, equipment, and supplies would produce income and employment and local and State  
2 tax revenue, resulting in a beneficial impact. Preconstruction would create 308 jobs and  
3 \$11.9 million in the first year, and 1687 jobs would be created during the peak year of  
4 construction with \$65.0 million of income. Operations would produce 3289 jobs and  
5 \$92.4 million in income in the first year of full operations. The jobs created include jobs at the  
6 proposed EREF and those indirectly created elsewhere in the 11-county ROI due to  
7 preconstruction, construction, and operation of the proposed EREF. Because preconstruction  
8 and construction activities would constitute less than 1 percent of total 11-county ROI  
9 employment, the economic impact of constructing the proposed EREF would, therefore, be  
10 SMALL.

11  
12 As it is anticipated that a number of workers will move into the area during each phase of the  
13 proposed project, with the majority of the demographic and social impacts associated with  
14 population in-migration likely to occur in Bingham and Bonneville Counties, the impacts of the  
15 proposed EREF on population, housing, and community services are assessed for a two-county  
16 ROI, consisting of Bingham and Bonneville Counties. The migration of workers and their  
17 families into surrounding communities would affect housing availability, area community  
18 services such as healthcare, schools, and law enforcement, and the availability and cost of  
19 public utilities such as electricity, water, sanitary services, and roads resulting in an adverse  
20 impact. Because of the small number of in-migrating workers expected during preconstruction,  
21 construction, and operations, the impact on housing and community and educational services  
22 employment would be SMALL.

23  
24 Decommissioning would provide continuing employment opportunities for some of the existing  
25 workforce and for other residents of the 11-county ROI. Additional, specialized  
26 decommissioning workers would also be required from outside the 11-county ROI.  
27 Expenditures on salaries and materials would contribute to the area economy, although less  
28 than during operations, and the State would continue to collect sales tax and income tax  
29 revenues. The socioeconomic impact of decommissioning activities would be SMALL.

30  
31 **Environmental Justice**

32  
33 SMALL. The potential impacts of the proposed EREF would mostly be SMALL for the resource  
34 areas evaluated. For these resources areas, the impacts on all human populations would be  
35 SMALL. Potential impacts would be SMALL to MODERATE or MODERATE in a few cases,  
36 which could potentially affect environmental justice populations; and there would be LARGE,  
37 though intermittent, short-term impacts from fugitive dist during preconstruction. However, as  
38 there are no low-income or minority populations within the 4-mile area around the proposed  
39 facility, these impacts would not be disproportionately high and adverse for these population  
40 groups.

41  
42 Impacts of decommissioning would be SMALL. Because impacts on the general population  
43 would generally be SMALL to MODERATE in other resource areas, and because there are no  
44 low-income or minority populations defined according to Council on Environmental Quality  
45 (CEQ) guidelines within the 4-mile area around the proposed facility, decommissioning would  
46 not be expected to result in disproportionately high or adverse impacts on minority or low-  
47 income populations.

48

1 **Accidents**

2  
3 SMALL TO MODERATE. Six accident scenarios were evaluated in this EIS as a representative  
4 selection of the types of accidents that are possible at the proposed EREF. The representative  
5 accident scenarios selected vary in severity from high- to intermediate-consequence events and  
6 include accidents initiated by natural phenomena (earthquake), operator error, and equipment  
7 failure. The consequence of a criticality accident would be high (fatality) for a worker in close  
8 proximity. Worker health consequences are low to high from the other five accidents that  
9 involve the release of UF<sub>6</sub>. Radiological consequences to a maximally exposed individual (MEI)  
10 at the Controlled Area Boundary (proposed EREF property boundary) are low for all six  
11 accidents including the criticality accident. Uranium chemical exposure to the MEI is high for  
12 one accident and low for the remainder. For HF exposure to an MEI at the proposed property  
13 boundary, the consequence of three accidents is intermediate, with a low consequence  
14 estimated for the remainder. All accident scenarios predict consequences to the collective  
15 offsite public of less than one lifetime cancer fatality. Impacts from accidents would be SMALL  
16 to MODERATE. Plant design, passive and active engineered and administrative controls, and  
17 management of these controls would reduce the likelihood of accidents.  
18

19 **POTENTIAL ENVIRONMENTAL IMPACTS OF THE NO-ACTION ALTERNATIVE**

20  
21 This EIS also considers the potential environmental impacts of the no-action alternative, which  
22 are summarized below. It is assumed that preconstruction activities have taken place under the  
23 no-action alternative. The impact conclusions presented in this EIS for the no-action alternative  
24 address the impacts of denying the license, but do not include the impacts of the NRC-approved  
25 preconstruction activities. This is because a decision by the NRC not to issue the license does  
26 not cause the impacts of preconstruction under the no-action alternative. As described in  
27 Chapter 4, the anticipated environmental impacts from the no-action alternative would range  
28 from SMALL to MODERATE.  
29

30 Should the nation's need for enriched uranium continue to increase and necessitate the  
31 construction and operation of another domestic enrichment facility at an alternate location,  
32 impacts could occur for each resource area and could range from SMALL to LARGE. The  
33 nature and scale of these impacts could be similar to those of the proposed action, but would  
34 depend on several facility- and site-specific factors.  
35

36 **Land Use**

37  
38 SMALL. Under the no-action alternative, AES would purchase the proposed property and  
39 restrictions on grazing and agriculture would occur. The zoning designation for the property  
40 would remain G-1 Grazing whether or not the proposed EREF is constructed. Current land  
41 uses of grazing and farming could potentially resume. Impacts to local land use would be  
42 SMALL.  
43

44 **Historic and Cultural Resources**

45  
46 SMALL TO MODERATE. Under the no-action alternative, the proposed EREF would not be  
47 constructed. Site MW004 would not be affected by NRC's licensing action, and Section 106 of  
48 the *National Historic Preservation Act* would not apply because no Federal action would be

1 involved. However, the removal of site MW004, which has already occurred, resulted in a  
2 LARGE impact because the site no longer exists; but because AES removed this site through  
3 professional excavation and data recovery and there are other homestead sites of this type  
4 found in the region, the impact has been mitigated to a MODERATE level. No visual or noise  
5 effects would occur to the viewshed for the Wasden Complex.  
6

## 7 **Visual and Scenic Resources**

8  
9 SMALL. Under the no-action alternative, since the proposed EREF would not be constructed,  
10 no visual intrusions to the existing landscape would occur. The current land cover would be  
11 altered, but no large industrial structures would be constructed. The existing natural character  
12 of the area would largely remain intact. The lack of development would be consistent with  
13 BLM's VRM Class I designation for the Hell's Half Acre WSA, and no intrusions to the Wasden  
14 Complex viewshed would occur.  
15

## 16 **Air Quality**

17  
18 SMALL. Under the no-action alternative, the air quality impacts associated with construction  
19 and operation of the proposed EREF would not occur. The proposed site could revert to  
20 agricultural activities, which would impact ambient air quality through the release of criteria  
21 pollutants from the operation of agricultural vehicles and equipment and the release of fugitive  
22 dusts from the tilling of soils. Local air impacts associated with the no-action alternative would  
23 be SMALL.  
24

## 25 **Geology and Soils**

26  
27 SMALL. Under the no-action alternative, no additional land disturbance from construction would  
28 occur, and the proposed site could revert to crop production and grazing activities. Wind and  
29 water erosion would continue to be the most significant natural processes affecting the geology  
30 and soils at the proposed site. Impacts would be SMALL.  
31

## 32 **Water Resources**

33  
34 SMALL. Under the no-action alternative, additional water use may or may not occur, depending  
35 on future plans for the proposed property. Water resources would be unchanged. Water usage  
36 could continue at the current rate should agricultural activities resume at the proposed site. No  
37 changes to surface water quality would be expected, and the natural (intermittent) surface flow  
38 of stormwater on the proposed site would continue. No additional groundwater use or adverse  
39 changes to groundwater quality would be expected. Impacts would be SMALL.  
40

## 41 **Ecological Resources**

42  
43 SMALL. Most impacts on ecological resources would occur during preconstruction. The  
44 potential impacts associated with the construction, operation, and decommissioning of the  
45 proposed EREF would not occur. Revegetation of the proposed site could occur with renewal of  
46 some wildlife habitat. The land could revert to crop production and grazing activities. Impacts  
47 would be SMALL.  
48  
49

1 **Noise**

2  
3 SMALL. Under the no-action alternative, none of the noise impacts associated with proposed  
4 EREF construction, operation, or decommissioning would occur. Land uses on the proposed  
5 EREF site could revert to previous applications, livestock grazing and/or crop production, with  
6 concomitant noise levels and SMALL impacts.  
7

8 **Transportation**

9  
10 SMALL. Under the no-action alternative, traffic volumes and patterns would remain unchanged  
11 from existing conditions. The current volume of radioactive material and chemical shipments  
12 from other sources in the area would not increase. Impacts would be SMALL.  
13

14 **Public and Occupational Health**

15  
16 SMALL. Under the no-action alternative, health impacts from construction, operation, and  
17 decommissioning would not occur. Worker and public impacts from chemical and radioactive  
18 hazards would also not occur. Should the land be returned to grazing and agriculture, current  
19 use impacts would be expected and would be SMALL.  
20

21 **Waste Management**

22  
23 SMALL. Under the no-action alternative, no proposed EREF construction, operational, or  
24 decommissioning wastes (including sanitary, hazardous, low-level radioactive wastes, or mixed  
25 wastes) would be generated or require disposition. Impacts from waste management would be  
26 SMALL.  
27

28 **Socioeconomics**

29  
30 SMALL. Under the no-action alternative, any beneficial or adverse consequences of the  
31 proposed action would not occur. All socioeconomic conditions in the 11-county ROI would  
32 remain unchanged. Impacts would be SMALL.  
33

34 Population in the area surrounding the proposed EREF, in Bonneville and Bingham Counties, is  
35 expected to grow in accordance with current projections, with the total population in the region  
36 projected to be approximately 156,491 in 2013 and 168,331 in 2017. In association with  
37 population growth, the social characteristics of the region, including housing availability, school  
38 enrollment, and availability of law enforcement and firefighting resources, are expected to  
39 change over time. However, future changes in these characteristics are difficult to quantify, and  
40 no projections of their future growth are available.  
41

42 **Environmental Justice**

43  
44 SMALL. The no-action alternative would not be expected to cause any high and adverse  
45 impacts. It would not raise any environmental justice issues.  
46  
47

1 **Accidents**

2  
3 SMALL. Under the no-action alternative, potential accidents and accident consequences from  
4 operation of the proposed EREF would not occur. Impacts would be SMALL.  
5

6 **COSTS AND BENEFITS OF THE PROPOSED ACTION**

7  
8 While there are national energy security and fiscal benefits associated with the proposed action,  
9 and local socioeconomic benefits in the 11-county ROI in which the proposed EREF would be  
10 located, there are also direct costs associated with the preconstruction, construction, and  
11 operation phases of the proposed project, as well as impacts on various environmental  
12 resources. These impacts would mostly be SMALL, and in a few cases SMALL to MODERATE,  
13 or MODERATE in magnitude and small in comparison to the local and national benefits of the  
14 proposed action. In addition, most of the impacts to environmental resources associated with  
15 the proposed action would result from preconstruction activities at the proposed site, and would  
16 also occur under the no-action alternative. The principal socioeconomic impact or benefit of the  
17 proposed EREF project would be an increase in employment and income in the 11-county ROI.  
18 Although the majority of the costs, and most of the socioeconomic impacts, of the various  
19 phases of proposed EREF development would occur in the 11-county ROI, there would be  
20 economic, fiscal and, in particular, energy security benefits, which would occur at the local,  
21 State, and national levels.  
22

23 Average employment created in the 11-county ROI during the year of peak construction is  
24 estimated at 1687 full-time jobs, with \$0.7 million in State income tax revenues and \$5.1 million  
25 in State sales taxes. During the proposed EREF full operations phase beginning in 2022,  
26 3289 annual jobs would be created. During this period, the State of Idaho would benefit from  
27 \$1.3 million annually in income taxes, while Bonneville County would collect \$3.5 million  
28 annually in property tax receipts. Although it can be assumed that some portion of paid State  
29 sales and income taxes would be returned to the 11-county ROI under revenue-sharing  
30 arrangements between each county and the State government, the exact amount that would be  
31 received by each county cannot be determined. Although there are economic and fiscal  
32 benefits associated with the proposed action in the 11-county ROI, these impacts would be  
33 SMALL.  
34

35 The direct costs associated with the proposed action may be categorized by the following life-  
36 cycle stages: facility construction, operation, depleted uranium disposition, and  
37 decommissioning. In addition, costs would be incurred for preconstruction activities under both  
38 the proposed action and the no-action alternative. In addition to monetary costs, the proposed  
39 action would result in impacts on various resource areas, which are considered “costs” for the  
40 purpose of this analysis. The resource areas and corresponding impacts are described in detail  
41 in Chapter 4 of this EIS. As discussed earlier, the impacts of preconstruction and the proposed  
42 action would mostly be SMALL, and in a few cases SMALL to MODERATE, or MODERATE, for  
43 all resource areas.  
44

45 The proposed action could result in the maximum annual production of 6.6 million SWUs of  
46 enriched uranium in peak years, which would represent an augmentation of the domestic supply  
47 of enriched uranium and, along with other planned new enrichment facilities, would meet the  
48 need for increased domestic supplies of enriched uranium for national energy security. Thus,



1 the proposed action would generate national and regional benefits and costs. The national  
2 benefit would be an increase in domestic supplies of enriched uranium that would assist the  
3 national energy security need. The regional benefits would be increased employment,  
4 economic activity, and tax revenues in the 11-county ROI. Costs associated with the proposed  
5 project are, for the most part, limited to the resource areas in the 11-county ROI.  
6

## 7 **COMPARISON OF THE PROPOSED ACTION AND NO-ACTION ALTERNATIVE**

8  
9 The impacts of the proposed action and the no-action alternative are briefly summarized and  
10 compared below. A more detailed summary and comparison is provided in Chapter 2,  
11 Table 2-6. As discussed earlier, it is assumed that the previously discussed preconstruction  
12 activities take place under both alternatives and, therefore, the impacts associated with  
13 preconstruction activities take place regardless of which alternative is selected. As a result, the  
14 comparison of alternatives presented below and in Chapter 2 is intended to highlight the  
15 differences between the two alternatives after preconstruction activities have occurred.  
16

17 Under the no-action alternative, the proposed EREF would not be constructed, operated, and  
18 decommissioned in Bonneville County, Idaho. The Paducah Gaseous Diffusion Plant in  
19 Paducah, Kentucky, the URENCO USA facility in Lea County, New Mexico, and the  
20 downblending of highly enriched uranium under the Megatons to Megawatts Program would  
21 remain the sole sources of domestically generated low-enriched uranium for U.S. commercial  
22 nuclear power plants. The URENCO USA facility is still under construction and with the ACP,  
23 which is currently under construction, may provide additional enrichment services in the future.  
24 The license application for an additional enrichment facility, the proposed GLE Facility, is  
25 currently under review by the NRC. Foreign enrichment sources would be expected to continue  
26 to supply approximately 85 percent of U.S. nuclear power plants' demand until new domestic  
27 enrichment facilities are constructed and operated.  
28

29 The no-action alternative would have SMALL impacts on land use, visual and scenic resources,  
30 air quality, geology and soils, water resources, ecological resources, noise, transportation,  
31 public and occupational health, waste management, socioeconomics, environmental justice,  
32 and facility accidents, and SMALL to MODERATE impacts on historic and cultural resources.  
33 The costs and benefits of constructing, operating, and decommissioning the proposed EREF  
34 would not occur. Additional domestic enrichment facilities could be constructed in the future  
35 with impacts expected to be SMALL to LARGE, depending on facility- and site-specific  
36 conditions.  
37

38 In comparison to the no-action alternative, the proposed action would also have SMALL impacts  
39 on land use, air quality, geology and soils, water resources, ecological resources, noise, public  
40 and occupational health, waste management, socioeconomics, and environmental justice, but  
41 would have SMALL to MODERATE impacts on historic and cultural resources, visual and scenic  
42 resources, transportation, and facility accidents. The proposed action would have positive  
43 impacts in the region on employment and income, and on State and Federal tax revenues.  
44

## 45 **CUMULATIVE IMPACTS**

46  
47 This EIS also considers cumulative impacts that could result from the proposed action when  
48 added to other past, present, and reasonably foreseeable future actions (Federal, non-Federal,  
49 or private). No ongoing or planned developments were identified within 16 kilometers (10 miles)



1 of the proposed project location, which includes the ROI for all affected resource areas except  
2 socioeconomics, which extends to an 80.5-kilometer (50-mile) radius. Proposed developments  
3 within 80.5 kilometers (50 miles) that could contribute to a regional socioeconomic impact in  
4 combination with the proposed project include the proposed Mountain States Transmission  
5 Intertie, a proposed 500-kV electrical transmission line running between western Montana and  
6 southeastern Idaho. The preferred route lies approximately 40 kilometers (25 miles) to the west  
7 of the proposed EREF site, running north-south. Two other alternate routes lie closer, the  
8 nearest running adjacent to the western boundary of the proposed EREF property just outside  
9 of INL property, and the other route crossing US 20 about 10 miles east of the proposed EREF  
10 site. In addition, impacts from the construction of a proposed new 161-kV transmission line, a  
11 substation, and substation upgrades for the proposed EREF are addressed as cumulative  
12 impacts in this EIS, as this action is not under the NRC's jurisdiction and, therefore, not  
13 considered by the NRC to be part of the proposed action. In general, the anticipated cumulative  
14 impacts from the proposed action would be SMALL. Cumulative impacts associated with the  
15 no-action alternative would be generally less than those for the proposed action, except in terms  
16 of local job creation.

17

## 18 **SUMMARY OF ENVIRONMENTAL CONSEQUENCES**

19

20 Preconstruction activities and the proposed action would result in unavoidable adverse impacts  
21 on the environment. These impacts would mostly be SMALL and SMALL to MODERATE or  
22 MODERATE in a few cases, with the potential for temporary and brief LARGE impacts on air  
23 quality from fugitive dust, and would, in most cases, be mitigated. The area needed for  
24 construction and operation of the proposed EREF would be cleared of vegetation, which would  
25 lead to the displacement of some local wildlife populations. There would be temporary impacts  
26 from preconstruction and the construction of new facilities, including increased fugitive dust,  
27 increased potential for soil erosion and stormwater pollution, and increased vehicle traffic and  
28 emissions. Water consumption from onsite wells would be relatively small, and the risk for  
29 significant adverse impacts on neighboring residential wells or public supply wells would be  
30 SMALL. During operations, workers and members of the public could be exposed to radiation  
31 and chemicals, although the impacts of these exposures would be SMALL.

32

33 Preconstruction and the proposed action would necessitate short-term commitments of  
34 resources and would permanently commit certain other resources (such as energy and water).  
35 This EIS defines short-term uses as generally affecting the present quality of life for the public  
36 (i.e., the 30-year license period for the proposed EREF) and long-term productivity as affecting  
37 the quality of life for future generations on the basis of environmental sustainability. The short-  
38 term use of resources would result in potential long-term socioeconomic benefits to the local  
39 area and the region.

40

41 Workers, the public, and the environment would be exposed to increased amounts of hazardous  
42 and radioactive materials over the short term from operations of the proposed EREF.  
43 Construction and operation would require a long-term commitment of terrestrial resources, such  
44 as land, water, and energy. Short-term impacts would be minimized by the application of  
45 appropriate mitigation measures. Upon the closure of the proposed EREF, AES would  
46 decontaminate and decommission the buildings and equipment and restore them for  
47 unrestricted use. Continued employment, expenditures, and tax revenues generated during the  
48 proposed action would directly benefit the local, regional, and State economies.

49

1 Irreversible commitment of resources refers to resources that are destroyed and cannot be  
2 restored, whereas an irretrievable commitment of resources refers to material resources that  
3 once used cannot be recycled or restored for other uses by practical means. The proposed  
4 action would include the commitment of land, water, energy, raw materials, and other natural  
5 and human-generated resources. Following decommissioning, the land occupied by the  
6 proposed facility would likely remain industrial beyond license termination. Water required  
7 during preconstruction and the proposed action would be obtained from new and existing wells  
8 at the proposed EREF property and would be replenished through natural mechanisms.  
9 Wastewaters would be treated to meet applicable standards and would evaporate. Energy used  
10 in the form of electricity and diesel fuel would be supplied through new infrastructure connecting  
11 to existing systems in the Idaho Falls area. The specific types of construction materials and the  
12 quantities of energy and materials used cannot be determined until final facility design is  
13 completed, but it is not expected that these quantities would strain the availability of these  
14 resources.

15  
16 During operation of the proposed EREF, natural  $UF_6$  would be used as feed material, requiring  
17 the mining of uranium (not licensed by the NRC) and other front end operational steps in the  
18 uranium fuel cycle (licensed by the NRC). This use of uranium would be an irretrievable  
19 resource commitment.

20  
21 Even though the land used to construct the proposed EREF would be returned to other  
22 productive uses after the proposed facility is decommissioned, there would be some irreversible  
23 commitment of land at other offsite locations used to dispose of solid wastes generated by the  
24 proposed facility. In addition, wastes generated during the conversion of depleted  $UF_6$   
25 produced by the proposed facility and the depleted uranium oxide conversion product from the  
26 conversion of depleted  $UF_6$  would be disposed at a licensed offsite LLRW disposal facility. Land  
27 used for disposal of these materials would represent an irreversible commitment of land. No  
28 solid wastes or depleted uranium oxide conversion product originating from the proposed EREF  
29 would be disposed of on the proposed EREF property. When the proposed facility is  
30 decommissioned, some building materials would be recycled and reused. Other materials  
31 would be disposed of in a licensed and approved offsite location, and the amount of land used  
32 to dispose of these materials would be an irretrievable land resource.

33

## ACRONYMS AND ABBREVIATIONS

1		
2		
3	$^{234}\text{U}$	uranium-234 (U-234)
4	$^{235}\text{U}$	uranium-235 (U-235)
5	$^{235}\text{UF}_6$	uranium-235 hexafluoride
6	$^{238}\text{U}$	uranium-238 (U-238)
7	$^{238}\text{UF}_6$	uranium-238 hexafluoride
8		
9	AAC	acceptable ambient concentration
10	AASHTO	American Association of State Highway and Transportation Officials
11	ACHP	Advisory Council on Historic Preservation
12	ACP	American Centrifuge Plant
13	ADAMS	Agencywide Documents Access and Management System
14	AERMOD	AMS/EPA Regulatory Model
15	AES	AREVA Enrichment Services, LLC
16	ALARA	as low as reasonably achievable
17	ANSI	American National Standards Institute
18	APE	Area of Potential Effect
19	Argonne	Argonne National Laboratory
20	ASTM	American Society of Testing and Materials
21	ATSDR	Agency for Toxic Substances and Disease Registry
22	AVLIS	Atomic Vapor Laser Isotope Separation
23		
24	BEA	U.S. Bureau for Economic Analysis
25	BLM	U.S. Bureau of Land Management
26	BLS	U.S. Bureau of Labor Statistics
27	BMP	best management practice
28	BSPB	Blending, Sampling, and Preparation Building
29		
30	CAA	<i>Clean Air Act</i>
31	CAB	Centrifuge Assembly Building or Controlled Area Boundary
32	$\text{CaF}_2$	calcium fluoride
33	Cal/EPA	California Office of Environmental Health Hazard Assessment
34	CCS	Center for Climate Studies
35	CDC	Centers for Disease Control and Prevention
36	CEDE	committed effective dose equivalent
37	CEQ	Council on Environmental Quality
38	CFR	U.S. <i>Code of Federal Regulations</i>
39	$\text{CH}_4$	methane
40	CTF	Centrifuge Test Facility
41	CO	carbon monoxide
42	$\text{CO}_2$	carbon dioxide
43	CREP	Conservation Reserve Enhancement Program
44	CWA	<i>Clean Water Act</i>
45	CY	calendar year
46		
47	D&D	decontamination and decommissioning
48	DDT	dichlorodiphenyltrichloroethane

1	DEM	Digital Elevation Model
2	DNFSB	Defense Nuclear Facilities Safety Board
3	DNL	day/night average noise level
4	DOC	U.S. Department of Commerce
5	DOE	U.S. Department of Energy
6	DOEQAP	DOE Quality Assurance Program
7	DOL	U.S. Department of Labor, U.S. Bureau of Labor Statistics
8	DOT	U.S. Department of Transportation
9		
10	EA	Environmental Assessment
11	EDE	effective dose equivalent
12	EIA	Energy Information Administration
13	EIS	Environmental Impact Statement
14	EMP	Effluent Monitoring Program
15	EPA	U.S. Environmental Protection Agency
16	ER	Environmental Report
17	ERDA	Energy Research and Development Administration
18	EREF	Eagle Rock Enrichment Facility
19	ESA	<i>Endangered Species Act</i>
20	ESRP	Eastern Snake River Plain
21		
22	FBI	Federal Bureau of Investigation
23	FEMA	Federal Emergency Management Agency
24	FGR	Federal Guidance Report
25	FR	<i>Federal Register</i>
26	FTE	full-time equivalent
27	FWCA	<i>Fish and Wildlife Coordination Act</i>
28	FWS	U.S. Fish and Wildlife Service
29		
30	GAO	U.S. General Accounting Office
31	GCRP	U.S. Global Climate Change Research Program
32	GDP	Gaseous Diffusion Plant
33	GE	General Electric
34	GEVS	Gaseous Effluent Ventilation System
35	GHG	greenhouse gas
36	GLE	Global Laser Enrichment
37	GWP	Global Warming Potential
38		
39	HAP	hazardous air pollutant
40	HEPA	high-efficiency particulate air
41	HEU	high-enriched uranium
42	HF	hydrogen fluoride or hydrofluoric acid
43	HFC	hydrofluorocarbon
44	HPS	Health Physics Society
45	HRCQ	Highway Route Controlled Quantity
46	HVAC	heating, ventilating, and air conditioning
47	HUD	U.S. Department of Housing and Urban Development
48		
49		

1	I	Interstate
2	IAC	<i>Idaho Administrative Code</i>
3	ICRP	International Commission on Radiological Protection
4	IDAPA	<i>Idaho Administrative Procedures Act</i>
5	IDC	Idaho Department of Commerce
6	IDEQ	Idaho Department of Environmental Quality
7	IDFG	Idaho Department of Fish and Game
8	IDWR	Idaho Department of Water Resources
9	IGS	Idaho Geological Survey
10	INL	Idaho National Laboratory
11	IPCC	Intergovernmental Panel on Climate Change
12	IPCS	International Programme on Chemical Safety
13	IROFS	Items Relied on for Safety
14	IS	<i>Idaho Statutes</i>
15	ISA	Integrated Safety Analysis
16	ISAC	Idaho Sage-grouse Advisory Committee
17	ISACTAT	Idaho Sage-grouse Advisory Committee Technical Assistance Team
18	ISCORS	Interagency Steering Committee on Radiation Standards
19	ISTC	Idaho State Tax Commission
20	ITD	Idaho Transportation Department
21	IWRB	Idaho Water Resource Board
22		
23	LCF	latent cancer fatality
24	L <sub>dn</sub>	day/night maximum average sound level
25	L <sub>eq</sub>	equivalent sound level
26	LES	Louisiana Energy Services
27	LEU	low-enriched uranium
28	LLRW	low-level radioactive waste
29	LOS	level of service
30	LTTS	Low Temperature Take-off Stations
31	LWR	light water reactor
32		
33	MAPEP	Mixed Analyte Performance Evaluation Program
34	MCL	maximum contaminant level
35	MCNP	Monte Carlo N-Particle
36	MDC	minimum detectable concentration
37	MDEQ	Montana Department of Environmental Quality
38	MEI	maximally exposed individual
39	MFC	Materials and Fuels Complex
40	MLIS	molecular laser isotope separation
41	MOA	Memorandum of Agreement
42	MRI	Midwest Research Institute
43	MSL	mean sea level
44	MW(e)	Megawatt electric
45		
46	NAAQS	National Ambient Air Quality Standards
47	NCDC	National Climatic Data Center
48	NCES	National Center for Education Statistics

1	NCRP	National Council on Radiation Protection and Measurements
2	NEF	National Enrichment Facility
3	NELAC	National Environmental Laboratory Accreditation Conference
4	NELAP	National Environmental Laboratory Accreditation Program
5	NEPA	<i>National Environmental Policy Act of 1966</i>
6	NESHAP	National Emission Standards for Hazardous Air Pollutants
7	NHPA	<i>National Historic Preservation Act of 1966</i>
8	NIOSH	National Institute of Occupational Safety and Health
9	NIST	National Institute of Standards and Technology
10	NLCD 1992	National Land Cover Data 1992
11	NMFS	National Marine Fisheries Service
12	NMVOC	nonmethane volatile organic compound
13	NNL	National Natural Landmark
14	N <sub>2</sub> O	nitrous oxide
15	NO <sub>2</sub>	nitrogen dioxide
16	NOAA	National Oceanic and Atmospheric Administration
17	NOI	Notice of Intent
18	NO <sub>x</sub>	nitrogen oxides
19	NPCR	National Program of Cancer Registries
20	NPDES	National Pollutant Discharge Elimination System
21	NPS	National Park Service
22	NRC	U.S. Nuclear Regulatory Commission
23	NRCP	National Council on Radiation Protection
24	NRCS	U.S. Natural Resources Conservation Service
25	NRHP	<i>National Register of Historic Places</i>
26	NWS	National Weather Service
27		
28	O <sub>3</sub>	ozone
29	OECD	Organisation for Economic Co-operation and Development
30	OEL	occupational exposure levels
31	OSHA	Occupational Safety and Health Administration
32		
33	PAH	polycyclic aromatic hydrocarbon
34	Pb	lead
35	PCB	polychlorinated biphenyl
36	PFC	perfluorocarbon
37	PGA	peak ground acceleration
38	PM	particulate matter
39	PM <sub>2.5</sub>	particulate matter equal to or smaller than 2.5 micrometers in diameter
40	PM <sub>10</sub>	particulate matter equal to or smaller than 10 micrometers in diameter
41	PNNL	Pacific Northwest National Laboratory
42	PSD	Prevention of Significant Deterioration
43	PTE	Potential to Emit
44	PWR	pressurized water reactor
45		
46	RAB	Restricted Area Boundary
47	RAI	Request for Additional Information
48	RCRA	<i>Resource Conservation and Recovery Act</i>
49		



1	REMP	Radiological Environmental Monitoring Program
2	RMP	Rocky Mountain Power or range management plan
3	ROI	region of influence
4	ROW	right-of-way
5		
6	SAAQS	State Ambient Air Quality Standards
7	SARA	<i>Superfund Amendments and Reauthorization Act</i>
8	SBM	Separations Building Module
9	SDWA	<i>Safe Drinking Water Act</i>
10	SER	Safety Evaluation Report
11	SF <sub>6</sub>	sulfur hexafluoride
12	SHPO	State Historic Preservation Office(r)
13	SILEX	separation of isotopes by laser excitation
14	SMCL	secondary maximum contaminant level
15	SO <sub>2</sub>	sulfur dioxide
16	SPCC	Spill Prevention Control and Countermeasures
17	SPL	sound pressure level
18	SUNSI	Sensitive Unclassified Non-Safeguards Information
19	SVOC	semivolatile organic compound
20	SWPPP	Stormwater Pollution Prevention Plan
21	SWU	separative work unit
22		
23	TEDE	Total Effective Dose Equivalent
24	TI	transportation index
25	TLD	thermoluminescent dosimeter
26	TRAGIS	Transportation Routing Analysis Geographic Information System
27	TSB	Technical Support Building
28	TSDf	treatment, storage, and disposal facility
29		
30	U <sub>3</sub> O <sub>8</sub>	triuranium octaoxide
31	UO <sub>2</sub> F <sub>2</sub>	uranyl fluoride
32	UBC	uranium byproduct cylinder
33	UF <sub>4</sub>	uranium tetrafluoride
34	UF <sub>6</sub>	uranium hexafluoride
35	UN	United Nations
36	UNFCCC	United Nations Framework Convention on Climate Change
37	URENCO	URENCO Group
38	USACE	U.S. Army Corps of Engineers
39	U.S.C.	<i>United States Code</i>
40	USCB	U.S. Census Bureau
41	USDA	U.S. Department of Agriculture
42	USEC	U.S. Enrichment Corporation
43	USGS	U.S. Geological Survey
44	USSLWG	Upper Snake Sage-grouse Local Working Group
45		
46	VOC	volatile organic compound
47	VRI	visual resource inventory
48		

1	VRM	visual resource management
2	VTM	vehicle miles traveled
3		
4	WSA	Wilderness Study Area

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**APPENDIX A**  
**ENVIRONMENTAL SCOPING SUMMARY REPORT**



**ENVIRONMENTAL IMPACT STATEMENT SCOPING  
PROCESS**

**SCOPING SUMMARY REPORT**

**Proposed AREVA Enrichment Services, LLC  
Eagle Rock Enrichment Facility  
Bonneville County, Idaho**

## 1. INTRODUCTION

On December 30, 2008, AREVA Enrichment Services LLC (AES) submitted its original application to the U.S. Nuclear Regulatory Commission (NRC) for a license to construct, operate, and decommission a gas centrifuge uranium enrichment facility to be located near Idaho Falls, Idaho. An Environmental Report was also submitted by AES at that time. On April 24, 2009, AES resubmitted its application to request an increase in enrichment capacity.

If licensed, the facility would enrich uranium for use in manufacturing commercial nuclear fuel for use in power reactors. Feed material would be natural (not enriched) uranium in the form of uranium hexafluoride (UF<sub>6</sub>), which contains the uranium-235 isotope. AES proposes to use centrifuge technology to enrich this isotope in the UF<sub>6</sub> to up to 5 percent by weight. The centrifuge would operate at below atmospheric pressure and would have a capacity up to 6.6 million separative work units (SWU). The enriched UF<sub>6</sub> would be transported to a fuel fabrication facility, while the depleted UF<sub>6</sub> would be stored onsite until it is sold, disposed of commercially, or taken by the U.S. Department of Energy.

In accordance with NRC regulations in 10 CFR Part 51 and the National Environmental Policy Act (NEPA), the NRC is preparing an Environmental Impact Statement (EIS) on the proposed facility as part of its decision making process. The EIS will examine the potential environmental impacts associated with the proposed AES facility in parallel with the review of the license application. In addition to the EIS, the NRC staff will prepare a Safety Evaluation Report (SER) on health and safety issues raised by the proposed action. The SER will document the NRC staff evaluation of the safety of the activities proposed by AES in its license application and the compliance with applicable NRC regulations.

On May 4, 2009, NRC published a Notice of Intent in the *Federal Register* (74 *Federal Register* 20508-20509) to prepare an EIS and to conduct the public scoping process, in accordance with the NEPA process. The scoping process is designed to help determine the range of actions, alternatives, and potential impacts to be considered in the EIS, and to identify significant issues related to the proposed action. The NRC solicits input from the public and other agencies in order to focus on issues of genuine concern.

On June 4, 2009, the NRC staff held a public scoping meeting in Idaho Falls, Idaho, to receive both oral and written comments from interested parties. The meeting began with the staff providing a description of the NRC's role, responsibilities, and mission. This was followed by an overview of the licensing process, including information on the safety review and environmental review processes. Also, NRC staff provided information on the means for the public's participation. Most of the meeting time was spent taking comments from attendees regarding the scope of the environmental review.

After publishing the draft EIS, NRC will invite the public to comment on that document. NRC will announce the availability of the draft EIS, the dates of the public comment period, and information about the public meeting in the *Federal Register*, on NRC's AREVA Enrichment Services Gas Centrifuge Facility Web site (<http://www.nrc.gov/materials/fuel-cycle-fac/arevanc.html>), and in the local news media. After evaluating comments on the draft EIS, the NRC staff will issue a final EIS that will serve as the basis for the NRC's consideration of environmental impacts in its decision on the proposed enrichment facility.



This report summarizes the determinations and conclusions reached in the scoping process. It is organized into four main sections. Section 1 provides an introduction and background information on the environmental review process. Section 2 summarizes the comments and concerns expressed by government officials, agencies, organizations, and the public. Section 3 identifies the issues that the draft EIS will address, and Section 4 identifies issues that are not within the scope of the draft EIS. Where appropriate, Section 4 also identifies other occasions in the decision making process where issues that are outside the scope of the draft EIS may be considered.

## **2. ISSUES RAISED DURING THE SCOPING PROCESS**

### **2.1 OVERVIEW**

The public scoping process is an important component in determining the major issues that the NRC should address in the draft EIS. The comments provided by the public addressed several subject areas related to the proposed AES facility and the development of the draft EIS.

Members of the public were able to submit comments on the scope of the AES enrichment facility EIS by e-mail, postal mail, and by speaking and/or submitting written comments at the public scoping meeting held in Idaho Falls, Idaho, on June 4, 2009. The scoping period began on May 4, 2009 and ended June 19, 2009.

Comments were received from 131 individuals or organizations. Approximately 120 individuals not affiliated with the NRC attended the June 4, 2009, public scoping meeting.

Most of the scoping comments (89) were received by e-mail; 37 people provided oral comments at the scoping meeting (two of these had also sent e-mail comments); and 7 people sent their comments by postal mail. Some people used more than one submittal method; they were not counted twice. The scoping meeting transcript (ML 091980464) and the written comments are available on NRC's Electronic Reading Room Web site at <http://www.nrc.gov/reading-rm.html>.

In addition to private citizens, commenters included:

- Shoshone-Bannock Tribes
- A representative of the Governor of Idaho
- Representatives for Idaho's U.S. Senators
- A representative for the U.S. Congressman, 2nd District of Idaho
- Three members of the Idaho State House of Representatives
- A member of the Idaho State Senate
- The mayor of Idaho Falls
- U.S. Environmental Protection Agency, Region 10
- Greater Idaho Falls Chamber of Commerce
- Bonneville County Commissioners
- Representatives of other organizations and businesses, including:
  - A Partnership for Science and Technology
  - Auto Building Trade and Construction Council

- Carpenter and Millwright Local Union, No. 808
- Cooper, Roberts, Simonsen Associates
- Diversified Metal Products
- Eastern Idaho Regional Medical Center
- Forde Johnson Oil Company
- Friends of the Earth
- Grow Idaho Falls
- Healthy Environmental Alliance of Utah (HEAL Utah)
- Idaho Conservation League
- Idaho Falls Regional Development Alliance
- Idaho Families for the Safest Energy
- Idaho State University
- International Brotherhood of Electrical Workers, Local 449
- Mayor's Youth Advisory Council (Idaho Falls)
- Snake River Alliance
- Tri-Valley Cares

The following general topics categorize the comments received during the public scoping period:

- NEPA and public participation
- Need for the proposed facility
- Alternatives
- Ecology
- Air quality and climate
- Geology and seismicity
- Water
- Land use and visual resources
- Human health
- Nuclear waste and hazardous materials
- Socioeconomics and cost
- Cultural resources and environmental justice
- Transportation
- Accidents
- Nonproliferation and security issues
- Cumulative impacts, and
- Miscellaneous topics

In addition to raising important issues about the potential environmental impacts of the proposed facility, some commenters offered opinions and concerns that typically would not be included in the subject matter of an EIS – these include general opinions about AES or issues that are more appropriately considered in the SER. Comments of this type are taken into consideration by the NRC staff, but they do not point to significant environmental issues to be analyzed. Other statements may be relevant to the proposed action, but they have no direct bearing on the evaluation of alternatives or on the decision making process involving the proposed action. For instance, general statements of support for or opposition to the proposed project fall into this category. Again, comments of this type have been noted but are not used in defining the scope and content of the EIS.

Section 2.2 summarizes the comments received during the public scoping period. Most of the issues raised have a direct bearing on the NRC's analysis of potential environmental impacts.

## 2.2 SUMMARY OF ISSUES RAISED

**General comments supporting the facility:** Nearly 50 percent of commenters expressed general support for the project. Many commenters provided specific reasons for their support, including: (1) the need for a domestic supply of enriched uranium to power the Nation's current and future nuclear reactors; (2) the need to produce more nuclear energy, which would reduce greenhouse gases and reduce the country's dependence on foreign oil; (3) the region's qualified workforce and long history in nuclear-related research and development; (4) the safety and efficiency of centrifuge technology; (5) the benefits to employment and other economic factors; and (6) AREVA's track record regarding safe operations, environmental stewardship, and community relations.

**General comments opposing the facility:** Approximately 30 percent of commenters stated their opposition to the project; in general, they stated that the increased risks to people and the environment outweighed the economic benefits. Many commenters mentioned that they thought AREVA had a poor track record in France, specifically they claimed that there had been routine dumping of radioactive liquids into the English Channel and a series of recent (2008) radioactive leaks and spills that were not reported to the public in a timely manner. Some commenters claimed that AREVA's mining activities in Niger over the past 40 years had depleted the local drinking water and radioactively contaminated the ground in the nearby town.

**General concerns:** Several commenters who were supportive of the proposed action noted that there were legitimate questions about potential environmental impacts that must be addressed in the draft EIS. Many commenters identified specific resource areas for which impacts should be addressed in the draft EIS. These included socioeconomic issues, water and air quality, waste management, noise, land use, geology and soils, cultural and environmental justice, ecology, public and occupational health, transportation, and security infrastructure impacts. More details on these issues can be found in the following sections of this scoping summary report.

The NRC staff will consider the comments provided during development of the EIS for the facility.



### 2.2.1 NEPA and Public Participation

Several commenters requested that public meetings be held in additional locations across the State to provide people throughout Idaho with the opportunity to comment on the proposal. Boise was mentioned most often, with commenters stating that it was the State capital and main population center. Other Idaho locations mentioned included Twin Falls, Coeur d'Alene, and the Wood River Valley. One commenter requested that meetings also be held in the Greater Yellowstone ecosystem area (specifically Wyoming), since that region's tourist industry could be adversely affected by having a nuclear facility in the vicinity.

Commenters pointed out that the impacts of the enrichment facility would not be limited to the Idaho Falls region. Most frequently mentioned were the tax incentives for the AREVA project that some thought were passed by the Idaho State Legislature and would affect Idahoans statewide. Other reasons given were that regions outside of Idaho Falls could be affected by accidents at the facility and by radioactive waste disposal.

Commenters mentioned the need to provide a forum in which the public could discuss and be informed about the radioactive wastes that the facility would generate, how the wastes would be handled, and the differences between the enriched uranium used to power reactors and the enriched uranium used for bombs.

### 2.2.2 Need for the Proposed Facility

Several made the general comment that uranium enrichment was needed for clean energy (nuclear power). On the other hand, a number of commenters wanted the EIS to include an in-depth analysis of the actual need for the proposed enrichment facility. They stated that the analysis should consider current and projected worldwide uranium enrichment capacity, the continuing downblending of surplus highly enriched uranium (HEU) in Russia and U.S. weapons stockpiles, and the current and projected number of nuclear power plants. In addition, mixed oxide fuel should be analyzed as another fuel supply. One commenter asked if plutonium, thorium, or other nuclear fuels could displace existing or potential demand for enriched uranium - will there be enough fuel capacity to serve the needs of future nuclear power plants without constructing the proposed facility.

Several commenters questioned the need for the proposed enrichment facility, given that there are renewable energy sources (solar, wind, biomass, geothermal, and hydropower) that are more environmentally friendly than nuclear power. One commenter stated that energy-need projections should take energy conservation and increased energy efficiencies into account.

### 2.2.3 Alternatives

One commenter stated that all reasonable alternatives should be evaluated, including ones that are outside the legal jurisdiction of the NRC, and that the EIS should discuss the reasons for eliminating alternatives that are not evaluated in detail. Reasonable alternatives should include, but are not limited to, alternative sites and different enrichment techniques. The commenter asked that the environmental impacts of the proposed action and no-action alternative be presented in comparative form and that the impacts of each alternative action be listed with corresponding mitigation measures.

Another commenter wanted the increased downblending of U.S and Russian HEU, as well as plutonium- and thorium-based fuels, to be analyzed as alternatives to the Eagle Rock Enrichment Facility (EREF). The analysis should include costs and environmental impacts.

#### 2.2.4 Ecology

A few commenters raised concerns about endangered and sensitive species in the vicinity of the proposed facility. They stated that the NRC should try to site facilities and infrastructure to avoid areas of critical habitat for species of concern and that a mitigation plan should be prepared for impacts that could not be avoided.

Commenters were particularly concerned about increased habitat fragmentation, since the project area contains habitat that is crucial to sagebrush obligate species. One commenter noted that the sagebrush steppe habitat is considered by Federal agencies as "imperiled" and an area of primary concern. One commenter specifically mentioned sage grouse, pygmy rabbits, sage thrasher, sage sparrow, and birds of prey and recommended avoiding construction in any designated areas or lands for special management for these species. This commenter also suggested that the project minimize impacts to big game winter habitat. There were also concerns about impacts to nesting habitat for migratory birds.

One commenter wanted further analysis of the impacts associated with the construction of two access roads from U.S. Highway 20 to the project site, specifically the additional risk associated with fire and the spread of invasive weeds.

#### 2.2.5 Air Quality and Climate

**Air quality:** A few commenters were concerned about the potential release of radioactive, hazardous, and toxic materials into the air. Commenters asked that the EIS include the following: (1) detailed information about ambient air conditions, (2) data on emissions of criteria pollutants, (3) information about mitigation measures, (4) an equipment emissions mitigation plan to reduce particulates and emissions associated with construction activities, (5) an evaluation of radioactive and nonradioactive emissions, (6) details on the use and disposal of filters, and (7) information on air impacts associated with accidents. One commenter requested that the applicant include air monitoring and reporting plans, including guidance for public alerts and containment.

**Climate change:** One commenter stated that the EIS should discuss how climate change could potentially influence the proposed project area resources and vice versa, especially within sensitive areas. He mentioned, as examples, changes in hydrology, sea level, weather patterns, precipitation rates, and chemical reaction rates.

#### 2.2.6 Geology and Seismicity

**Geology and soil:** One commenter noted that construction of facilities and access roads may also inadvertently compact the soil or disturb it, thus compromising the ability of a site to handle the normal flow of organisms, nutrients, and toxic wastes. The commenter stated that the EIS analysis should include a detailed discussion of the "cumulative effects from this and other



projects on the hydrologic conditions of the project area." Another commenter suggested establishing citing criteria to minimize soil disturbances and erosion on steep slopes.

**Seismicity:** A commenter recommended that the EIS discuss the potential for seismic risk associated with uranium enrichment activities and how this risk would be evaluated, monitored, and managed. They suggested that a seismic map be referenced or included in the EIS. The commenter stated that uranium enrichment activities could cause increased earthquake activity in tectonically active zone. Another commenter noted that eastern Idaho sits on a geologically unstable fault zone extending across southern Idaho to Yellowstone.

### **2.2.7 Water**

Several commenters expressed concerns about adverse impacts the proposed facility would have on both surface water and groundwater. Of particular concern was the Snake River aquifer, which is located below the proposed site. The fear was that nuclear waste stored at the facility would seep into the aquifer and contaminate the groundwater.

Some commenters were concerned that water used by the facility would deplete the groundwater supply. In addition to depleting the supply, a commenter noted that the pumping action could increase existing groundwater contamination caused by seepage of toxic and radioactive contaminants into the groundwater. On the other hand, a few commenters stated that the facility would use less water than current agricultural activities.

A commenter recommended that the potential impacts to groundwater and other drinking water sources be fully analyzed and that mitigation measures be identified for significant impacts. They also stated that the EIS should document the project's "consistency with applicable stormwater permitting requirements" and include a discussion of specific mitigation measures that may be needed to reduce "adverse impacts to water quality and aquatic resources."

### **2.2.8 Land Use and Visual Resources**

One commenter noted that the proposed AREVA facility would be located within an area of ranching and farming. There were local concerns about trespass, dust, impacts on livestock, impacts to local wells and groundwater, and traffic. Another commenter mentioned using visual resource management guidelines as an example of ways to minimize negative impacts.

### **2.2.9 Human Health**

There were some comments related to the human health risks associated with long-term exposure to small amounts of uranium; increased risk for childhood leukemia and general concerns about cancer rates were mentioned.

One commenter questioned whether the NRC and AREVA could "scientifically demonstrate the legal requirement that this plant will not expose any member of the public to more than 10 mrem in any given year." Exposure from waste disposal was specifically mentioned. This commenter wanted the EIS to include the following: (1) an explanation as to why uranium exposure has greater health effects than are presently calculated by NRC safety standards; (2) how the alpha recoil problem is addressed by the NRC, since "alpha emitters can leak through four HEPA filters in a



row, in excess of the 99.97 percent filtering rate used presently"; and (3) a response to the complaints in the report from Centers' for Disease Control and Prevention (CDC's) SENES group on the understatement of fluoride toxicity at Oak Ridge.

Another commenter wanted the EIS to describe the measures that would be taken to ensure that workers involved in the transport of radioactive materials would be protected, including those loading and unloading shipments.

#### **2.2.10 Nuclear Waste and Hazardous Materials**

**Radioactive waste:** Nearly 40 percent of the commenters mentioned the need to address the impacts (environmental and economic) associated with long-term storage of the nuclear waste that would be produced by the enrichment process. There were concerns that the proposed facility would be adding to the nuclear waste that is already being stored at Idaho National Laboratory, particularly since no permanent nuclear waste depository has been designated. Many commenters noted that depleted uranium is hard to store safely and becomes "more radioactive over time." Another commenter pointed out that, although the depleted uranium becomes more radioactive over time due to radioactive ingrowth, the level of radioactivity never exceeds that found in natural uranium ore deposits.

Commenters noted that the NRC is still in the process of preparing specific rules for the depleted uranium waste stream. One commenter stated that the draft EIS should include a discussion of the rulemaking process and how (or whether) the rulemaking and current licensing processes can proceed simultaneously.

Commenters wanted the draft EIS to consider the environmental impacts of a full range of disposition pathways for the depleted uranium tails, including currently available disposal sites and those that are proposed. The analyses should include indefinite storage of uranium hexafluoride, indefinite storage of some other conversion product, disposal at new-surface nuclear waste disposal sites, and disposal at deep geologic sites. Commenters wanted NRC to assess the costs of each alternative.

Some commenters asked that the draft EIS discuss the environmental impacts associated with recycle/reuse disposition pathways or deconversion of the waste to a safer form (to an oxide). They noted that the United States lacks an operational deconversion facility and that the two deconversion plants currently under construction may not be able to handle the added inventory from the Louisiana Energy Services plant in New Mexico and the proposed Eagle Rock facility.

One commenter stated that the draft EIS must provide a description of the financial assurance for the indefinite storage of the depleted uranium at the AREVA site.

**Hazardous materials:** A few commenters were concerned that hazardous materials from the facility would contaminate the air and water. One commenter stated that hazardous materials in retention basins have the potential to settle in sediments and be released into the air.

Commenters wanted the draft EIS to discuss the potential direct, indirect, and cumulative impacts of hazardous waste from construction and operation of the project, including waste types and volumes and transport, storage, disposal, and mitigation measures. There were also concerns about pollutants that could be associated with the ventilation system. One commenter

asked that subsequent environmental documentation include a management plan for toxic and hazardous materials.

#### 2.2.11 Socioeconomics and Costs

Several commenters mentioned positive socioeconomic impacts that the facility would bring to the community, particularly jobs. One commenter stated that he had looked into the increased housing, schooling, and transportation needs that would be expected during construction and operations phases and determined that the region would be able to accommodate them.

Many people commented on the costs of building and operating the facility, which would be partly covered by tax subsidies and increased electricity rates; cost overruns and delays in France, Poland, and Finland were cited as examples.

One commenter wanted the draft EIS to provide an analysis of the global market for uranium, including a scenario in which nuclear plants do not expand beyond current numbers or even decline. Another commenter noted that the economies of the Teton Valley, Jackson, WY, and West Yellowstone into Cody, WY, are fairly dependent on tourism. He asked that the EIS look at how many new jobs and how much new money would be brought into the region if the same amount of money were used to create and support small businesses.

Other commenters asked about the ramifications of foreign ownership (see Section 2.2.17, miscellaneous topics).

#### 2.2.12 Cultural Resource and Environmental Justice

**Cultural resources:** One commenter stated that the EIS should describe the process and outcome of government-to-government consultation between the NRC and each of the Tribal governments in the vicinity of the project, any issues raised, and how those issues were addressed.

Another commenter noted that the proposed facility would be in close proximity to the Fort Hall Indian Reservation and within the aboriginal territories of the Shoshone-Bannock Tribes. This commenter stated that they would like the Heritage Tribal Office (HeTO) to be part of the cultural surveys of the proposed site and to be notified of any inadvertent cultural or archaeological discoveries.

A third commenter pointed out that the proposed site is in an area of rich and relatively well-preserved prehistoric and historic resources, noting the Wasden site, which is within one mile of the project area, and the relatively undisturbed and abundant archaeological sites within Idaho National Laboratory and on public and private lands in the vicinity.

Commenters pointed out that mitigation for all culturally sensitive items needed to be done and asked that contractors and permanent employees be informed about cultural regulations and Federal laws concerning artifacts and retrieving and removing historic items.



One commenter wanted to know if AREVA will share information about transportation routes, hazards associated with shipment, and the number of shipments. He also wanted to know if AREVA would provide training to the Tribes Emergency Management and Response staff on identifying and responding to a transportation accident on the reservation.

Another commenter questioned the transportation route of product to and from the EREF and whether AREVA will share information regarding the number of shipments and hazards of the shipments, and whether the facility will provide training to the Tribes Emergency Management and Response staff to identify and respond to a transportation accident on the reservation.

**Environmental justice:** One commenter stated that the EIS should include an evaluation of environmental justice populations within the project area and should address the potential for disproportionate adverse impacts to minority and low-income populations. The commenter stated that the EIS should include: information describing the process used to inform communities about the project and the potential impacts on the communities; input received from the communities; and a description on how that input was used in project-related decisions. Another commenter stated that sensitive population exposure scenarios needed to be developed from the standpoint of both workers and members of the public.

### 2.2.13 Transportation

Some commenters asked that the EIS include an assessment of the impacts of the transportation of the facility's feedstock, product, and waste, and of transportation-related accidents, including transportation-related emissions and possible exposures. The EIS should also describe measures that will be taken to decrease the chances of a transportation accident involving radioactive material and to ensure that workers involved in the transport of radioactive materials will be protected, including those loading and unloading shipments. One commenter want the draft EIS to include information about what form the uranium will be in when it is transported to Idaho—yellowcake, gaseous uranium tetrafluoride, or uranium hexafluoride. Alternative transportation routes and modes should be analyzed; routes and modes that present a significant risk to the public and natural resources should be avoided.

One commenter stated that the EIS should provide information about the transportation of hazardous and toxic materials to and from the project site, including amounts, methods of transport, and the types of containment vessels.

Some commenters were concerned about traffic safety on portions of U.S. Highway 20 running from Idaho Falls to the proposed EREF. They pointed out that the highway already has safety issues, since it is used by large, slow-moving agricultural machinery with many access roads on both sides. The addition of construction workers and construction traffic would add to the already congested conditions and create an increased safety risk. Commenters asked that the EIS describe local transportation safety issues and suggest solutions. One commenter wanted further analysis of the impacts associated with the construction of two access roads from U.S. Highway 20 to the project site.

One commenter noted that AREVA workers would find themselves in competition for seating on airline flights that are already filled to capacity and suggested that the region pursue a carrier to establish a new service to Las Vegas.

#### 2.2.14 Accidents

There were a few comments concerning accidents. One commenter wanted to know how AREVA would respond to accident scenarios on the proposed site and how the public would be informed. Another was concerned about transportation accidents resulting in the release of radioactive materials to the environment and asked that the EIS describe measures that will be taken to minimize the chances of this type of accident. A third commenter stated that the draft EIS must analyze the air impacts of all potential accidents. Note: Section 2.2.13 of this summary also discusses accidents.

#### 2.2.15 Nonproliferation and Security Issues

**Nonproliferation:** Several commenters were concerned that uranium enrichment could lead to the production of nuclear bombs and wondered if the use of enrichment technology could undermine U.S. efforts involving international nonproliferation.

One commenter stated that since there is a potential connection between a facility's ability to enrich uranium to fuel grade and the ability to continue enrichment to weapons grade, a proliferation analysis must be included in the draft EIS. Another commenter asked for a nonproliferation impact assessment.

A commenter stated that the analysis must include "both a technical discussion and a discussion by the U.S. Departments of State and Energy and the White House of their efforts to curtail uranium enrichment elsewhere and whether or not those efforts are affected by commercial enrichment in this country." Another commenter wanted the EIS to explain why the International Atomic Energy Agency had not been involved in the project.

**Security issues:** Some commenters raised concerns about fissile material (which has the potential for nuclear bomb-making) getting into the hands of terrorists and hostile countries like Iran and North Korea. They pointed out that the AREVA facility as well as the nuclear materials shipments going to and from the facility were subject to attack. One commenter asked for a detailed accounting of AREVA's plans to secure its nuclear materials at the facility and during transport. Another commenter wanted an account of the environmental impact of sabotage to the fluoride gas supply. One commenter wanted AREVA to commit to donating money to increase the local police and fire departments.

#### 2.2.16 Cumulative Impacts

One commenter stated that the draft EIS should include a detailed discussion of the cumulative effects from this and other projects on the hydrologic conditions of the project area. On a more general level, commenters wanted the EIS to identify the current condition, describe the trend in the condition, and predict the future condition for each resource that is at risk and/or significantly impacted by the proposed project before mitigation. The EIS should identify the resources that could experience cumulative impacts, the time period over which impacts could occur, and the geographic area impacted. Parties that would be responsible for avoiding, minimizing, and mitigating adverse impacts should be identified. Another commenter wanted the draft EIS to discuss the potential direct, indirect, and cumulative impacts of hazardous waste.



### 2.2.17 Miscellaneous Topics

**Other potential facility operations:** One commenter was concerned that AREVA would become involved in the re-enrichment of reprocessed uranium. The commenter wanted a clear statement in the draft EIS by AREVA that it would not engage in re-enrichment. If this statement could not be made, the commenter wanted the draft EIS to discuss the capacity of the plant to process contaminated reprocessed uranium, the measures to protect workers from additional radiation exposures, an analysis of unique waste streams, and the transportation risks associated with shipping the reprocessed uranium by land and sea.

Another commenter wanted the draft EIS to assess the use of the plant to separate other isotopes of uranium, such as U-233, or to purify uranium-contaminated materials.

**Mining and milling operations:** A few commenters wanted the EIS to fully analyze the "front end" impacts associated with the operation of the proposed enrichment facility. They wanted the draft EIS to look at the environmental and human health impacts in the communities where uranium mining and milling activities were occurring. It was noted that these activities would not likely be occurring in the United States.

**Foreign ownership:** A few commenters raised issues about the foreign ownership of AREVA. One commenter wondered who would pay in the event of an accident and if the United States Government would argue with France over damages. Another commenter wondered what would happen if AREVA went out of business and stated that AREVA could only survive financially if it was supported by the French government. The commenter stated that U.S. taxpayers would ultimately have to cover any damages resulting from accidents, nuclear waste, and other issues associated the facility. Another commenter was concerned that profits would go to France and not to the United States.

**Facility design:** One commenter advocated integrating International Atomic Energy Agency safeguards for the proposed facility at the design phase. Another commenter asked if the facility design had been approved by the NRC for use in the United States.

**Comments on the Environmental Report and Safety Analysis Report:** One commenter stated that AREVA had adequately addressed the safety and environmental issues in the Environmental Report submitted with the NRC application. Other commenters had areas of concern including: (1) the ability of the Idaho Falls fire department to provide timely support, given its distance from the proposed facility; (2) the adequacy of the emergency backup systems; (3) the transportation analysis; and (4) the impact analysis of ecological resources, particularly the pending Endangered Species Act listings of sage grouse and the pygmy rabbit. There was also a concern that the Environmental Report was not detailed enough to ensure the reduction of impacts or appropriate mitigation plans. Commenters asked that subsequent documents provide a more detailed analysis, particularly in the areas involving water, air, and public health.

One commenter stated that AREVA was pushing the NRC to exempt it from the requirement to provide decommissioning funding assurance for the licensed operating period of the facility. The commenter noted that the EREF Safety Analysis Report (SAR) excluded "escalation, contingency, interest, tails disposition, decommissioning, and any replacement equipment" in its cost estimates. The commenter wanted the draft EIS to discuss in detail the exemptions that were being considered, particularly those listed in the SAR.

**Power usage:** One commenter wanted the draft EIS to analyze an additional load that the AREVA facility would add to the power grid. Another commenter wanted a commitment to use renewable energy sources (including nuclear power) to run the facility.

**Out of scope issues:** A few commenters specifically asked that issues raised that were not directly related to the assessment of potential impacts of the project, or the decision making process, be dismissed from the draft EIS and discussed elsewhere.

### **3. SUMMARY AND CONCLUSIONS**

#### **3.1 SCOPE OF THE EIS AND SUMMARY OF ISSUES TO BE ADDRESSED**

NEPA (Public Law 91-90, as amended), and the NRC's implementing regulations for NEPA (10 CFR Part 51), specify in general terms what should be included in an EIS prepared by the NRC staff. Regulations established by the Council on Environmental Quality (40 CFR Parts 1500-1508), while not binding on the NRC staff, provide useful guidance. The NRC staff has also prepared environmental review guidance to its staff for meeting NEPA requirements associated with licensing actions ("Environmental Review Guidance for Licensing Actions Associated with Office of Nuclear Material Safety and Safeguards (NMSS) Programs", NUREG -1748).

Pursuant to 10 CFR 51.71(a), in addition to public comments received during the scoping process, the contents of the draft EIS will depend in part on the environmental report. In accordance with 10 CFR 51.71(b), the draft EIS will consider major points of view and objections concerning the environmental impacts of the proposed action raised by other Federal, State, and local agencies, by any affected Indian tribes, and by other interested persons. Pursuant to 10 CFR 51.71(c), the draft EIS will list all Federal permits, licenses, approvals, and other entitlements which must be obtained in implementing the proposed action, and will describe the status of compliance with these requirements. Any uncertainty as to the applicability of these requirements will be addressed in the draft EIS.

Pursuant to 10 CFR 51.71(d), the draft EIS will include a consideration of the economic, technical, and other benefits and costs of the proposed action and alternatives to the proposed action. In the draft analysis, due consideration will be given to compliance with environmental quality standards and regulations that have been imposed by Federal, State, regional, and local agencies having responsibilities for environmental protection. The environmental impact of the proposed action will be evaluated in the draft EIS with respect to matters covered by such standards and requirements, regardless of whether a certification or license from the appropriate authority has been obtained. Compliance with applicable environmental quality standards and requirements does not negate the requirement for NRC to weigh all environmental effects of the proposed action, including the degradation, if any, of water quality, and to consider alternatives to the proposed action that are available for reducing adverse effects. While satisfaction of NRC standards and criteria pertaining to radiological effects will be necessary to meet the licensing requirements of the Atomic Energy Act, the draft EIS will also, for the purposes of NEPA, consider the radiological and non-radiological effects of the proposed action and alternatives.

Pursuant to 10 CFR 51.71(e), the draft EIS will normally include a preliminary recommendation by the NRC staff with respect to the proposed action. Any such recommendation would be



reached after considering the environmental effects of the proposed action and reasonable alternatives, and after weighing the costs and benefits of the proposed action.

The scoping process summarized in this report will help determine the scope of the draft EIS for the proposed facility. The draft EIS will contain a discussion of the cumulative impacts of the proposed action. The development of the draft EIS will be closely coordinated with the SER prepared by the NRC staff to evaluate the health and safety impacts of the proposed action.

The goal in writing the EIS is to present the impact analyses in a manner that makes it easy for the public to understand. This EIS will provide the basis for the NRC decision with regard to potential environmental impacts. Significant impacts will be discussed in greater detail in the EIS, and explanations will be provided for determining the level of detail for different impacts. This should allow readers of the EIS to focus on issues that were determined to be important in reaching the conclusions supported by the EIS. The following topical areas and issues will be analyzed in the EIS.

- *Public and worker safety and health.* The draft EIS will include a determination of potentially adverse effects on human health that result from chronic and acute exposures to ionizing radiation and hazardous chemicals as well as from physical safety hazards. These potentially adverse effects on human health might occur during facility construction and operation. Impacts associated with the implementation of the proposed action will be assessed under normal operation and credible accident scenarios.
- *Alternatives.* The draft EIS will describe and assess the no-action alternative and other reasonable alternatives to the proposed action. Other reasonable alternatives to the proposed action will be considered such as alternative sites, enrichment sources, or technological alternatives to the proposed centrifuge technology.
- *Waste management.* The draft EIS will discuss the management of wastes, including byproduct materials, generated from the construction and operation of the EREF to assess the impacts of generation, storage, and disposition. Onsite storage of wastes will also be included in this assessment.
- *Depleted uranium disposition.* The draft EIS will address concerns about the depleted uranium hexafluoride material, or tails, resulting from the enrichment operation over the lifetime of the proposed plant's operation. These concerns include the safe and secure storage and ultimate removal of this material from Idaho, and potential conversion of UF<sub>6</sub> to U<sub>3</sub>O<sub>8</sub> and ultimate disposition.
- *Water resources.* The draft EIS will assess the potential impacts on groundwater quality and water use due to the implementation of the proposed action.
- *Geology and seismicity.* The draft EIS will describe the geologic and seismic characteristics of the proposed EREF site. Evaluation of the potential for earthquakes, ground motion, soil stability concerns, surface rupturing, and any other major geologic or seismic considerations that would affect the suitability of the proposed site will be addressed in the SER rather than in the draft EIS.
- *Compliance with applicable regulations.* The draft EIS will present a listing of the relevant permits and regulations that are believed to apply to the proposed EREF. These would include air, water, and solid waste regulations and disposal permits.

- *Air quality.* The draft EIS will make determinations concerning the meteorological conditions of the site location, the ambient air quality, and the contribution of other sources. In addition, the draft EIS will assess the impacts of the EREF's construction and operation on the local air quality.
- *Transportation.* The draft EIS will discuss impacts associated with the transportation of construction material, centrifuges, and feed and tails during both normal transportation and transportation under credible accident scenarios. The impacts on local transportation routes due to workers, large vehicles delivering needed equipment and materials, and vehicles removing waste from the proposed facility will be evaluated in the draft EIS.
- *Accidents.* The draft EIS will analyze the potential environmental impacts resulting from credible accidents at the EREF. The SER will assess the impacts associated with credible accidents at the proposed EREF, both from natural events and human activities. Based on the analyses, the EIS will summarize the potential environmental impacts resulting from credible bounding accidents at the proposed facility.
- *Land use.* The draft EIS will discuss the potential impacts associated with the changes in land use from predominately rangeland to industrial.
- *Socioeconomic impacts.* The draft EIS will address the demography, the economic base, labor pool, housing, utilities, public services, education, recreation, and cultural resources as impacted by EREF. The hiring of new workers from outside the area could lead to impacts on regional housing, public infrastructure, and economic resources. Population changes leading to changes to the housing market and demands on the public infrastructure will be assessed in the draft EIS.
- *Cost/benefits.* The draft EIS will address the potential cost/benefits of constructing and operating the EREF, and will discuss the cost/benefits of tails disposition options.
- *Cultural resources.* The draft EIS will assess the potential impacts of the proposed EREF on the historic and archaeological resources of the area and on the cultural traditions and lifestyle of Indian tribes.
- *Resource commitments.* The draft EIS will address the unavoidable adverse impacts, irreversible and irretrievable commitments of resources, and the relationship between local, short-term uses of the environment and the maintenance and enhancement of long-term productivity. In addition, associated mitigative measures and environmental monitoring will be presented.
- *Ecological resources.* The draft EIS will assess the potential environmental impacts of the proposed EREF on ecological resources including plant and animal species and threatened or endangered species or critical habitat that may occur in the area. As appropriate, the assessment will include an analysis of mitigation measures to address adverse impacts.
- *Need for the facility.* The draft EIS will provide a discussion of the need for the proposed EREF and the expected benefits.



- *Decommissioning.* The draft EIS will include a discussion of facility decommissioning and associated impacts.
- *Cumulative impacts.* The draft EIS will address the potential cumulative impacts from past, present, and reasonably foreseeable activities at and near the site.

#### **4. ISSUES CONSIDERED OUTSIDE THE SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT**

The purpose of an EIS is to assess the potential environmental impacts of a proposed action as part of the decision-making process of an agency—in this case, a licensing decision. As noted in Section 2.2, some issues and concerns raised during the scoping process are not relevant to the EIS because they are not directly related to the assessment of potential impacts or to the decision making process. The lack of in depth discussion in the EIS, however, does not mean that an issue or concern lacks value. Issues beyond the scope of the EIS either may not yet be ripe for resolution or are more appropriately discussed and decided in other venues.

Some of these issues raised during the public scoping will not be addressed in the EIS. Major categories of these issues not analyzed in detail in the EIS include nonproliferation concerns, security and safety issues, and credibility.

Some of these issues raised during the public scoping process for the proposed facility are outside the scope of the draft EIS, but they will be analyzed in the SER. For example, health and safety issues will be considered in detail in the SER prepared by NRC staff for the proposed action and will be summarized in the EIS. The draft EIS and the SER are related in that they may cover the same topics and may contain similar information, but the analysis in the draft EIS is limited to an assessment of potential environmental impacts. In contrast, the SER primarily deals with safety evaluations and procedural requirements or license conditions to ensure the health and safety of workers and the general public. The SER also covers other aspects of the proposed action such as demonstrating that the applicant will provide adequate funding for the proposed facility in compliance with NRC's financial assurance regulations.



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**APPENDIX B  
CONSULTATION CORRESPONDENCE**

|





**APPENDIX B  
CONSULTATION CORRESPONDENCE**

**B.1 Threatened and Endangered Species Consultation**

June 17, 2009

Mr. Damien Miller  
U.S. Fish and Wildlife Service  
Eastern Idaho Field Office  
4425 Burley Dr., Suite A  
Chubbuck, ID 83202

Dear Mr. Miller:

SUBJECT: REQUEST FOR INFORMATION REGARDING ENDANGERED SPECIES AND  
CRITICAL HABITATS FOR THE PROPOSED AREVA EAGLE ROCK  
ENRICHMENT FACILITY LOCATED IN BONNEVILLE COUNTY, IDAHO

Dear Mr. Miller:

On December 30, 2008, AREVA Enrichment Services (AES) submitted an environmental report (ER) to the U.S. Nuclear Regulatory Commission (NRC). The ER is one part of an application for a license to authorize construction, operation, and decommissioning of a proposed uranium enrichment facility. The NRC staff is in the initial stages of developing an Environmental Impact Statement (EIS) for the proposed facility to be located near Idaho Falls, Idaho in Bonneville County. The facility, if licensed, would use a gas centrifuge based technology to enrich the isotope uranium-235 in uranium hexafluoride up to 5 percent by weight. The EIS will document the impacts associated with the construction, operation, and decommissioning of the proposed facility.

NRC requests a list of threatened or endangered species or critical habitats within the action area for the proposed facility. The proposed AES parcel is approximately 1,700 hectares (4,200 acres). AES states that the facility footprint encompasses 381 hectares (941 acres) of the site for which construction, operation, and decommissioning activities will occur. The proposed site is situated within Bonneville County, Idaho, on the north side of U.S. Highway 20, about 113 km (70 miles) west of the Idaho/Wyoming State line. The coordinates for the center of the action area are 43 degrees, 35 minutes, 7.37 seconds North and longitude 112 degrees, 25 minutes, 28.71 seconds West.

We have enclosed additional background information relating to ecological resources on the site, including a map showing the action area, as it appears in the AES ER.

D. Miller

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We intend to use the EIS process to comply with Section 7 of the Endangered Species Act of 1973, as amended. After assessing information you provide, we will determine what additional actions are necessary to comply with the Section 7 consultation process. If you have any questions or comments, or need any additional information, please contact Gloria Kulesa of my staff at 301-415-5308.

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015

- Enclosures:
1. Ecology Field Study Report Proposed Site for the Eagle Rock Enrichment Facility
  2. Ecology Field Study Report Proposed Site for the Eagle Rock Enrichment Facility – Fall 2008 Survey
  3. Sage Grouse Survey Report Proposed for the Eagle Rock Enrichment Facility



United States Department of the Interior  
FISH AND WILDLIFE SERVICE

Eastern Idaho Field Office  
4425 Burley Dr., Suite A  
Chubbuck, Idaho 83202  
Telephone (208) 237-6975  
<http://IdahoES.fws.gov>



JUL 15 2009

USNRC  
Attn: Gloria Kulesa  
MS T8 F5  
11545 Rockville Pike  
Rockville, MD 20854


Subject: Proposed Areva Eagle Rock Enrichment Facility in Bonneville County,  
Idaho. SL #09-0471

Dear Ms. Kulesa:

The U.S. Fish and Wildlife Service (Service) is writing in response to your request for information about the potential impacts to endangered, threatened, proposed, and/or candidate species from the proposed Areva Eagle Rock Enrichment Facility in Bonneville County, Idaho. The Service has not identified any issues that indicate that consultation under section 7 of the Endangered Species Act of 1973, as amended, is needed for this project. This finding is based on our understanding of the nature of the project, local conditions, and/or current information indicating that no listed species are present. If you determine otherwise or require further assistance, please contact Sandi Arena of this office at (208)237-6975 ext 102.

Thank you for your interest in endangered species conservation.

Sincerely,

  
for Damien Miller  
Supervisor, Eastern Idaho Field Office



February 18, 2010

Damien Miller  
U.S. Fish and Wildlife Service  
Eastern Idaho Field Office  
4425 Burley Dr., Suite A  
Chubbuck, Idaho 83202

SUBJECT: REQUEST FOR INFORMATION REGARDING THREATENED OR  
ENDANGERED SPECIES AND CRITICAL HABITATS FOR PROPOSED  
TRANSMISSION LINE LOCATED IN BONNEVILLE COUNTY, IDAHO, TO  
POWER THE PROPOSED AREVA EAGLE ROCK ENRICHMENT FACILITY

Dear Mr. Miller:

As discussed in our earlier letter to you dated June 17, 2008, AREVA Enrichment Services LLC (AES) has submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for a license to construct, operate, and decommission a gas centrifuge uranium enrichment facility; and NRC is preparing an Environmental Impact Statement (EIS) in support of our licensing action for this facility. The proposed facility, the Eagle Rock Enrichment Facility (EREF), would be located in Bonneville County, Idaho, near Idaho Falls. Thank you for your July 15, 2009, response to our letter. The purpose of the present letter is to report an addition to the scope of the EREF project, a 161-kilovolt (KV) transmission line to power the facility, and request additional information for the vicinity of the proposed transmission line project.

On January 29, 2010, AES submitted supplemental information to NRC for the construction and operation of a proposed transmission line, an electrical substation, and substation upgrades. The locations of the transmission line and substations are shown in the January 29, 2010 submittal, a copy of which is enclosed. NRC's EIS for the proposed EREF will include a discussion of the impacts associated with the construction and operation of the transmission line project. NRC requests a list of threatened or endangered species and critical habitats within the action area for the proposed transmission lines and associated facilities. The action area is described below and in greater detail in the enclosure.

The new transmission line and associated structures would be located entirely on private land within Bonneville County. Rocky Mountain Power (RMP), a division of PacifiCorp, will be the builder, owner, and operator. The transmission line would originate from the existing RMP Bonneville Substation and extend in a general westward direction to the new point of service, the Twin Buttes Substation on the proposed EREF site. Beginning at the Bonneville Substation, the proposed transmission line route is west along the county road (West 65 North Street) to the existing RMP Kettle Substation, a distance of approximately 14.5 kilometers (9 miles), continuing west to the eastern portion of the EREF site, a distance of approximately 1.2 kilometer (0.75 mile), then north within the EREF site to its northern end, then west and south to the new RMP Twin Buttes Substation, for a distance of approximately 6.4 kilometers (4 miles). The area being affected by the transmission line is approximately 84 hectares (208 acres).

D. Miller

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NRC intends to use the EIS process to comply with Section 7 of the Endangered Species Act of 1973, as amended. After assessing the information you provide, we will determine what additional actions are necessary to comply with the Section 7 consultation process.

If you have any questions regarding this request, or need additional information, please contact Stephen Lemont of my staff at 301-415-5163 or [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov).

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosure:  
January 29, 2010 Ltr.

Docket No: 70-7015





United States Department of the Interior  
FISH AND WILDLIFE SERVICE

Eastern Idaho Field Office  
4425 Burley Dr., Suite A  
Chubbuck, Idaho 83202  
Telephone (208) 237-6975  
<http://idahoES.fws.gov>



MAR 09 2010

Andrea Kock  
US Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: Proposed Areva Eagle Rock Transmission Line Project Species List Request,  
Bonneville County, Idaho  
SL # 10-0242

Dear Ms. Kock:

The Fish and Wildlife Service (Service) is providing you with a list of endangered, threatened, proposed, and/or candidate species, and designated critical habitat which may occur in the area of the proposed Areva Eagle Rock transmission line project located in Bonneville, County. You requested this list by letter on February 18, 2010. This list fulfills the requirements for a species list under section 7(c) of the Endangered Species Act of 1973 (Act), as amended. If the project decision has not been made within 180 days of this letter, regulations require that you request an updated list. Please refer to the species list (SL) number shown above in all correspondence and reports.

Section 7 of the Act requires Federal agencies to assure that their actions are not likely to jeopardize the continued existence of endangered or threatened species. Federal funding, permitting, or land use management decisions are considered to be Federal actions subject to section 7. If the proposed action may affect a listed species, consultation with the Service is required. Formal consultation must be initiated for any project that is likely to adversely affect a threatened or endangered species. If a project involves a major construction activity and may affect listed species, Federal agencies are required to prepare a Biological Assessment. If a proposed species is likely to be jeopardized or if proposed critical habitat will be adversely modified by a Federal action, regulations require a conference between the Federal agency and the Service. A Federal agency may designate, in writing, you or another non-Federal entity to represent them in an informal consultation.

In a decision published in the July 9, 2007 Federal Register, the Service concluded that protections for the bald eagle (*Haliaeetus leucocephalus*) under the Act were no longer warranted. Effective August 8, 2007, the bald eagle is no longer included on the list of threatened and endangered species in the lower 48 states pursuant to the Act, and has been removed from all Idaho species lists. However, the protections provided to the bald eagle under the Bald and Golden Eagle Protection Act (BGEPA, 16 U.S.C. 668) and the Migratory Bird Treaty Act (MBTA, 16 U.S.C. 703) will remain in place. To assist with the delisting transition, the Service has developed National Bald Eagle Management Guidelines to advise land managers

and project proponents when, and under what circumstances, the protective provisions of the BGEPA and MBTA may apply to their activities. These guidelines, as well as additional information on the protection of bald eagles, are available on the Service's web site at: <http://www.fws.gov/migratorybirds/haldeagle.htm>. The Service also is available to provide technical assistance regarding bald eagle conservation.

In addition to listed species, transmission lines have the potential to affect migratory birds, which are afforded protection under the MBTA (40 Stat. 755; 16 U.S.C. 703-712). In addition to considering the potential impacts of the proposed project to listed species we recommend that you identify and implement measures to assure the project complies with the MBTA. The Service suggests your Agency review the Avian Power Line Interaction Committee's "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006" for more information on migratory birds and transmission lines ([www.aplic.org](http://www.aplic.org)). Additionally, more information on impacts to migratory birds and/or the Service's recommendations can be found on the web at <http://www.fws.gov/migratorybirds>.

If you have any questions about your responsibilities under section 7 of the Act, or require further information, please contact Ty Matthews of our Eastern Idaho Field Office at (208)237-6975 extension 115. Thank you for your interest in endangered species conservation.

Sincerely,

  
Acting Supervisor  
Eastern Idaho Field Office

Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington D.C. and Sacramento, California.



BONNEVILLE COUNTY, IDAHO

LISTED SPECIES	COMMENTS
Canada lynx ( <i>Lynx canadensis</i> )	LT
Ute ladies'-tresses ( <i>Spiranthes diluvialis</i> )	LT
Utah valvata snail ( <i>Valvata utahensis</i> )	LE
Grizzly bear ( <i>Ursus arctos</i> )	LT

PROPOSED SPECIES

None

CANDIDATE SPECIES<sup>1</sup>

Yellow-billed cuckoo ( <i>Coccyzus americanus</i> )	C
Greater Sage-Grouse ( <i>Centrocercus urophasianus</i> )	C

- LE - Listed Endangered
- LT - Listed Threatened
- XN - Experimental/Non-essential population
- PT - Proposed Threatened
- C - Candidate

<sup>1</sup>Candidate species have no protection under the Act, but are included for your early planning consideration. Candidate species could be proposed or listed during the project planning period, and would then be covered under Section 7 of the Act. The Service advises an evaluation of potential effects on candidate species that may occur in the project area.

July 14, 2010

Mr. Ty Matthews  
U.S. Fish and Wildlife Service  
Eastern Idaho Field Office  
4425 Burley Dr., Suite A  
Chubbuck, ID 83202

SUBJECT: NOTIFICATION OF THE ISSUANCE OF AND REQUEST FOR COMMENTS ON  
THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED  
AREVA ENRICHMENT SERVICES LLC EAGLE ROCK ENRICHMENT  
FACILITY IN BONNEVILLE COUNTY, IDAHO

Dear Mr. Matthews:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application submitted by AREVA Enrichment Services LLC (AES) for a license to construct, operate, and decommission a uranium enrichment facility near Idaho Falls in Bonneville County, Idaho. The proposed Eagle Rock Enrichment Facility (EREF), if licensed, would use a gas centrifuge process to enrich uranium-235 isotope found in natural uranium to concentrations up to 5 percent by weight. The enriched uranium would be used to manufacture nuclear fuel for commercial nuclear power reactors.

As part of the review of the application, the NRC has prepared a Draft Environmental Impact Statement (EIS) (NUREG-1945). The Draft EIS includes an analysis of relevant environmental issues, including potential impacts on ecological resources, and documents the NRC staff's preliminary determination regarding the environmental impacts from the preconstruction (e.g., site preparation), construction, operation, and decommissioning of the proposed uranium enrichment facility. Many of the activities required to build a uranium enrichment facility do not fall within NRC's regulatory authority and, therefore, are not "construction" as defined by the NRC. Such activities are referred to as "preconstruction" activities in Title 10 of the *U.S. Code of Federal Regulations* (10CFR) 51.45(c). The proposed 161-kilovolt (kV) electrical transmission line required to provide power to the proposed EREF also falls under this category.

By letters dated June 17, 2009, and February 18, 2010, the NRC requested information from the U.S. Fish and Wildlife Service (USFWS) on Federally listed threatened or endangered species or critical habitat that may be at or in the vicinity of the proposed EREF site and proposed transmission line project, respectively. In those letters, the NRC indicated that it intends to use the EIS process to comply with Section 7 of the Endangered Species Act of 1973, as amended (ESA); and that after assessing the information provided by the USFWS, the NRC will determine what additional actions are necessary to comply with the Section 7 consultation process. The USFWS responded to these letters as follows:

- In a letter dated July 15, 2009, the USFWS stated that no listed species are present [at the EREF site], and that no issues were identified that indicate that consultation under Section 7 of the ESA is needed for this project; and



- In a letter dated March 9, 2010, the USFWS provided a list of endangered, threatened, proposed, and candidate species that may potentially occur in the area of the proposed transmission line project. That list identified the following four Federally listed species: Canada lynx (*Lynx canadensis*), Ute ladies'-tresses (*Spiranthes diluvialis*), Utah valvate snail (*Valvata utahensis*), and Grizzly bear (*Ursus arctos*). The letter also identified the Yellow-billed cuckoo (*Coccyzus americanus*) and the Greater Sage-Grouse (*Centrocercus urophasianus*) as candidate species for listing, provided information on the status of the bald eagle (*Haliaeetus leucocephalus*), and indicated the potential of the transmission lines to affect migratory birds. However, in a subsequent telephone conversation between the NRC and you on April 15, 2010, you indicated that the list of endangered, threatened, proposed, and candidate species provided by the USFWS was for Bonneville County in general; you did not believe that these species are in the vicinity of, or potentially impacted by, the transmission line project; and consultation under Section 7 of the ESA would not be needed for these species for the project.

The Draft EIS describes the NRC staff's evaluation of the potential impact of the proposed EREF project on ecological resources. Based on this evaluation, which included consideration of the information provided by the USFWS, the NRC staff's preliminary conclusion is that the preconstruction, construction, operation, and decommissioning of the proposed project would not adversely affect any of the four Federally listed species. In the context of the National Environmental Policy Act of 1969, as amended (NEPA), under which the Draft EIS was prepared, the NRC staff's preliminary determination is that the impact on ecological resources from the preconstruction, construction, operation, and decommissioning of the proposed project would be small to moderate.

In accordance with our June 17, 2009, and February 18, 2010, letters, the NRC staff is forwarding the Draft EIS to you for your review and comment. We are requesting your comments on the Draft EIS and on our preliminary conclusions regarding listed species under USFWS purview and will address your comments in the Final EIS. Please provide any information or comments on the enclosed Draft EIS that you consider appropriate under the provisions of the NEPA, ESA, and Fish and Wildlife Coordination Act of 1934, as amended, during the comment period, which ends on Monday, September 13, 2010. Comments should be submitted either by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop TWB-05-B01M, Washington, DC 20555-0001, or by e-mail to [EagleRock.EIS@nrc.gov](mailto:EagleRock.EIS@nrc.gov).

The NRC staff plans to hold a public meeting to discuss the contents of the Draft EIS on Thursday, August 12, 2010, at the Red Lion Hotel on the Falls Convention Center, 475 River Parkway, Idaho Falls, Idaho 83402. The meeting will convene at 7:30 p.m. and will continue until 10:00 p.m. The meeting will be transcribed and will include the following agenda items: (1) a brief presentation of NRC's roles and responsibilities and the licensing process, (2) a presentation summarizing the contents of the Draft EIS, and (3) an opportunity for interested government agencies, tribal governments, organizations, and individuals to provide comments on the Draft EIS. Additionally, the NRC staff will host informal discussions in an open house forum one hour before the start of the meeting, during which members of the public may meet and talk with NRC staff members. You and other USFWS staff are invited to attend.



T. Matthews

3

If you have any questions or require additional information, please contact Mr. Stephen Lemont, Senior Project Manager, by phone at 301-415-5163, or by e-mail at [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov).

Sincerely,

/RA/

Diana Diaz-Toro, Chief  
Environmental Review Branch A  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015

Enclosure:  
Draft EIS

cc without enclosure: See next page

June 22, 2009

Mr. Cal Groen, Director  
Idaho Fish and Game  
600 South Walnut  
Post Office Box 25  
Boise, Idaho 83707

SUBJECT: REQUEST FOR INFORMATION REGARDING ENDANGERED SPECIES AND  
CRITICAL HABITATS FOR THE PROPOSED AREVA EAGLE ROCK  
ENRICHMENT FACILITY LOCATED IN BONNEVILLE COUNTY, IDAHO

Dear Mr. Groen:

On December 30, 2008, AREVA Enrichment Services (AES) submitted an environmental report (ER) to the U.S. Nuclear Regulatory Commission (NRC). The ER is one part of an application for a license to authorize construction, operation, and decommissioning of a proposed uranium enrichment facility. The NRC staff is in the initial stages of developing an Environmental Impact Statement (EIS) for the proposed facility to be located near Idaho Falls, Idaho in Bonneville County. The facility, if licensed, would use a gas centrifuge based technology to enrich the isotope uranium-235 in uranium hexafluoride up to 5 percent by weight. The EIS will document the impacts associated with the construction, operation, and decommissioning of the proposed facility.

NRC requests information on the following items within the action area for the proposed facility, if available:

- Endangered or threatened species, or other species of concern to the state of Idaho, that are known to be or likely to be at the proposed AREVA site, and nearest known locations based on the element occurrence database. Attached is a preliminary list of species compiled from Idaho Fish and Game (IDFG) county lists (plants) and the IDFG Snake River Basalts Ecological Section list (animals). Habitat on the site consists of sagebrush steppe, non-native grassland (primarily crested wheatgrass and cheatgrass), and irrigated crops.
- Nearest known lek sites (based on the element occurrence database), nesting habitat, brood-rearing habitat, and winter habitat for greater sage grouse, migratory status of the local population, the number of leks nears the site, and trends.
- Information on Sagebrush Reserves (location, size, species, management) or other sensitive or rare habitats in the project vicinity.
- Information on mule deer, pronghorn, and elk herds, including seasonal habitat (such as crucial winter habitat areas), local migration routes, and concerns such as population trends.
- Important migration routes for migratory birds.
- Maps or GIS shapefiles regarding species or habitats.
- Concerns of IDFG regarding potential impacts of the proposed project.

C. Groen

2

The proposed AES parcel is approximately 1,700 hectares (4,200 acres). AES states that the facility footprint encompasses 381 hectares (941 acres) of the site for which construction, operation, and decommissioning activities will occur. The proposed site is situated within Bonneville County, Idaho, on the north side of U.S. Highway 20, about 113 km (70 miles) west of the Idaho/Wyoming State line. The coordinates for the center of the action area are 43 degrees, 35 minutes, 7.37 seconds North and longitude 112 degrees, 25 minutes, 28.71 seconds West.

We have enclosed additional background information relating to ecological resources on the site, including a map showing the action area, as it appears in the AES ER.

We intend to use the EIS process to comply with Section 7 of the Endangered Species Act of 1973, as amended. After assessing information you provide, we will determine what additional actions are necessary to comply with the Section 7 consultation process. If you have any questions or comments, or need any additional information, please contact Gloria Kulesa of my staff at 301-415-5308.

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015

Enclosures:

1. Special Status Plants and Species
2. Ecology Field Survey Report
3. Fall 2008 Survey
4. Sage Grouse Survey Report

cc: Paul Kjellander,  
ID Office of Energy Resources

## Idaho Special Status Plants and Species of Greatest Conservation Need

Earth lichen (*Catapyrenium congestum*)  
Gray willow (*Salix glauca*)  
Green spleenwort (*Asplenium trichomanes-ramosum*)  
Iodine bush (*Allenrolfea occidentalis*)  
Meadow milkvetch (*Astragalus diversifolius*)  
Payson's bladderpod (*Lesquerella paysonii*)  
Payson's milkvetch (*Astragalus paysonii*)  
Red glasswort (*Salicornia rubra*)  
Slickspot peppergrass (*Lepidium papilliferum*)  
Ute ladies'-tresses (*Spiranthes diluvialis*)  
Western Sedge (*Carex occidentalis*)

Utah valvata snail (*Valvata utahensis*)

Northern leopard frog (*Rana pipiens*)

Ring-necked snake (*Diadophis punctatus*)

Black-crowned night-heron (*Nycticorax nycticorax*)  
Blue grosbeak (*Passerina caerulea*)  
Burrowing owl (*Athene cunicularia*)  
California gull (*Larus californicus*)  
Ferruginous hawk (*Buteo regalis*)  
Franklin's gull (*Larus pipixcan*)  
Juniper titmouse (*Baeolophus ridgwayi*)  
Lesser goldfinch (*Carduelis psaltria*)  
Merlin (*Falco columbarius*)  
Northern pintail (*Anas acuta*)  
Peregrine falcon (*Falco peregrinus*)  
Pinyon jay (*Gymnorhinus cyanocephalus*)  
Sharp-tailed grouse (*Tympanuchus phasianellus*)  
Swainson's hawk (*Buteo swainsoni*)  
Virginia's warbler (*Vermivora virginiae*)  
White-faced ibis (*Plegadis chihi*)  
Yellow-billed cuckoo (*Coccyzus americanus*)

Canada lynx (*Lynx canadensis*)  
Gray wolf (*Canis lupus*)  
Great Basin ground squirrel (*Spermophilus mollis*)  
Grizzly bear (*Ursus arctos*)  
Idaho pocket gopher (*Thomomys idahoensis*)  
Little pocket mouse (*Perognathus longimembris*)  
Merriam's shrew (*Sorex merriami*)  
Pygmy rabbit (*Brachylagus idahoensis*)  
Spotted bat (*Euderma maculatum*)  
Townsend's big-eared bat (*Corynorhinus/Plecotus townsendii*)  
Townsend's pocket gopher (*Thomomys townsendii*)  
Wyoming ground squirrel (*Spermophilus elegans*)

Enclosure 1





**IDAHO DEPARTMENT OF FISH AND GAME**

600 S. Walnut/P.O. Box 25  
Boise, Idaho 83707

C.L. "Butch" Otter/Governor  
Cal Groen/Director

August 4, 2009

Ms. Andrea Kock,  
Chief, Environmental Review Branch  
Nuclear Regulatory Commission  
Washington, DC 20555-0001

**RE: Request for information regarding endangered species and critical habitats for the proposed AREVA Eagle Rock Enrichment Facility located in Bonneville County, Idaho.**

Dear Ms. Kock:

Idaho Department of Fish and Game (IDFG) has reviewed the above referenced request for information from the Nuclear Regulatory Commission (NRC) regarding the potential development of a uranium enrichment facility in Bonneville County, Idaho. Our interest in the project is in protecting fisheries, wildlife, plants and their habitats. To date, IDFG has been involved in this proposal as follows; (1) Our Regional Supervisor and environmental Staff Biologist from the Upper Snake Region were briefed on the potential for this project at our Idaho Falls Office in 2008 by AREVA staff while the project was still being considered, and (2) staff from the Idaho Falls office attended the Nuclear Regulatory Commission's public open house in Idaho Falls on 4 June 2009.

Resident species of fish and wildlife are the property of all citizens within the state and decisions affecting fish and wildlife therefore are the concern of all Idahoans. The Idaho Department of Fish and Game and the Idaho Fish and Game Commission, are charged with the statutory responsibility to preserve, protect, perpetuate, and manage all fish and wildlife in Idaho (Idaho Code § 36-103(a)). Your letter contains seven information requests. We responded to those we were able to and we offer additional summary comments regarding the AREVA project.

We note that IDFG has no specific project proposal upon which to comment. The summary letter sent to us has no specifics beyond a "parcel" size, a "footprint" size, and the location of the center of the facility. This is not sufficient for us to evaluate the effects the project may have on fish, wildlife, and their habitat. You refer in your letter to an application for a license submitted to the NRC but you have not provided this application for our consideration. For IDFG to consider more general questions, such as the request for our concerns about potential impacts of the project, we will need a specific project description that depicts not only the size and location of the project but enough specifics for us to gauge potential wildlife disturbances and impacts. The proposal description should include, but not necessarily be limited to:

- Location including all boundaries, fences, developed structures, access ways such as roads and trails,
- Size of developments including buildings, parking lots, power lines, energy production facilities, etc,
- Anticipated and licensed/permitted levels of discharges from the permitted activity including light, sound, odor, and water discharges,

*Keeping Idaho's Wildlife Heritage*

Equal Opportunity Employer • 208-334-3700 • Fax: 208-334-2114 • Idaho Relay (TDD) Service: 1-800-377-3529 • <http://fishandgame.idaho.gov>



Page 2  
Ms. Andrea Kock  
August 4, 2009

- Associated infrastructure such as trucking centers off-site, housing for workers (both permanent and temporary), power lines to be constructed, piping for materials, and any other construction associated with the project,
- Current land use patterns and conditions of all lands to be built upon or fenced from public and wildlife access,
- Public lands (state, federal, county, local, municipal) to be fenced or restricted in any way from public access or from fish/wildlife use. Included should be proposals to mitigate for these lands lost to the public or fish and wildlife, and
- Entire project life, license life, decommissioning and clean-up schedule and penalties for noncompliance.

We offer the following in response to your seven requests. The information provided in 1) and 2) was determined using the coordinates of the project center provided in your letter and a buffer with a radius of 8 km around that point intersected with data from the Idaho Fish and Wildlife Information System which includes data on sage-grouse, at-risk animals, and at-risk plants (Accessed July 28, 2009).

1) *Endangered or threatened species and species of other species of concern :*

The IDFG Conservation Data Center contains two individual observations of Ferruginous Hawks (*Buteo regalis*) and one nest observation for ferruginous hawks. Hibernacula for Townsend's big-eared bats (*Corynorhinus townsendii*) also occur in the area. Immediately west of the west-edge of the 8 km buffer is a group of lava tube caves that are important bat roosts and hibernacula. There are no known occurrences of at-risk plant species in the immediate vicinity of the project site. The nearest known occurrences of at-risk plants is 40 km NW of the site.

2) *Nearest known sage-grouse(Centrocercus urophasianus) lek sites:*

One sage-grouse lek was identified within the 8 km buffer of the center of the project. Additional leks were identified near the site but outside the buffer area. Without knowing the extent of developments associated with this project it is not possible to gauge what sage grouse habitats the project may affect. However, both "Key Sage Grouse Habitats" and "Perennial Grasslands" habitats are found along Highway 20 and fairly near the project that might be affected by the project. These habitats are described and graphed (Fig. 4-11 page 4-49) in the Conservation Plan for the Greater Sage Grouse in Idaho which is available as follows:  
[http://fishandgame.idaho.gov/cms/hunt/grouse/conserv\\_e\\_plan/](http://fishandgame.idaho.gov/cms/hunt/grouse/conserv_e_plan/)

3) *Sagebrush Reserves:*

The Idaho National Engineering and Environmental Laboratory Sagebrush Steppe Ecosystem Reserve was established by proclamation in 1999. The Proclamation was signed by Secretary of Energy Bill Richardson, (for) the Regional Director, Region 1 U.S. Fish and Wildlife Service by Richard Munoz, (for) the State Director of Idaho, Bureau of Land Management, by Elena Daly, (for) the Interim Director, Idaho Fish and Game by Don Wright. The Reserve itself lies both north and south of Highway 33, but does not reach as far south as Highway 20. The management plan may be found online as follows:

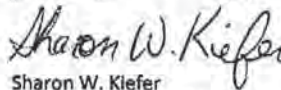
<http://ar.inel.gov/owa/getimage.2?F PAGE=1&F DOC=ID-074-02-067&F REV=00>

Page 3  
Ms. Andrea Kock  
August 4, 2009

4. *Information on mule deer, pronghorn, and elk herds and habitats:*  
IDFG manages mule deer, pronghorn antelope, and elk by analysis units that are made up of Game Management Units (GMU). We do not have information on the property you are specifically developing, but your project would potentially be in GMU 63. We have summarized data regarding these three species in Appendix A. Aerial survey information on pronghorn in the area has been collected by consultants at Idaho National Laboratory. IDFG does not consider the location of this project to be winter range or critical range for mule deer or elk. Pronghorn do frequently use lands surrounding the proposed site throughout all seasons.
5. *Important migration routes for migratory birds:*  
IDFG is unaware of any known migratory flight corridors for birds that fall near the stated center of the project. However, upon disclosure of other project developments we may reconsider this question.
6. *Maps or GIS shapefiles regarding species or habitats:*  
IDFG has hundreds of GIS layers that we work with throughout each year. As stated, this request is too vague to respond adequately.
7. *Concerns of IDFG:*  
We appreciate being asked to comment regarding this question. However, without a complete project description as discussed above, we do not have enough information to answer this question. Upon receipt of a full disclosure of the proposal IDFG staff will begin to consider and assess impacts to fish wildlife and habitats of whatever is disclosed. This is the most important question you asked us; we hope to receive a full project description so we may fulfill this request.

We look forward to further information about this project to better accommodate your information request. If you have any questions about our technical information, please contact Gary Vecellio, Environmental Staff Biologist in our Upper Snake Regional Office, (208)525-7290.

Sincerely,



Sharon W. Kiefer  
Assistant Director-Policy

SWK/kc

Enclosures

Cc: S. Schmidt, G. Vecellio, L. Hebdon, IDFG  
P. Kjellander, Idaho Office of Energy Resources

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**Appendix A. Mule deer, pronghorn, and elk herd status.**

IDFG does not conduct aerial surveys to estimate mule deer, elk or pronghorn herd sizes in Unit 63. Without aerial survey data herd sizes are tracked using harvest as an index of abundance. Hunting opportunities (season length and timing) for these species have remained stable over the last five years. For mule deer in unit 63 hunter numbers and harvest during the general any weapon season have remained fairly stable (Figure 1). There are no data to suggest that the mule deer population is declining. Elk hunter numbers and harvest in Unit 63 have increased slightly over the previous five years (Figure 2). There are no data to suggest the elk population is declining, and it may be slightly increasing. Hunter success (harvest per hunter) has increased in the Unit 63 controlled, any-weapon pronghorn hunts (Figure 3). Hunter numbers and harvest during the unit 63 general archery season pronghorn hunt have increased over time (Figure 4). There are no data to suggest that pronghorn populations are declining, and they may be increasing.

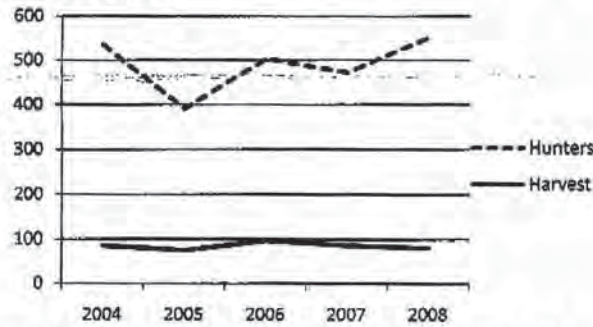


Figure 1. Unit 63 deer harvest and hunter trends from 2004 through 2008. Harvest includes whitetailed deer which averaged 31% of the harvest.

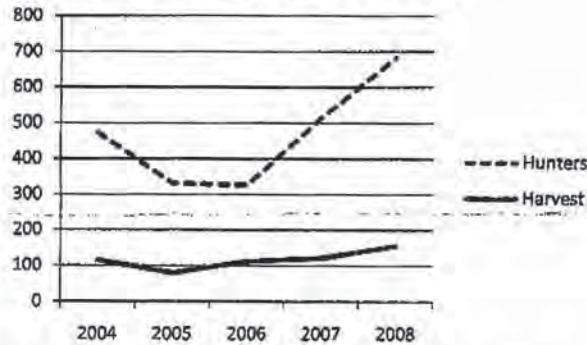


Figure 2. Unit 63 elk harvest and hunter numbers from 2004 through 2008.

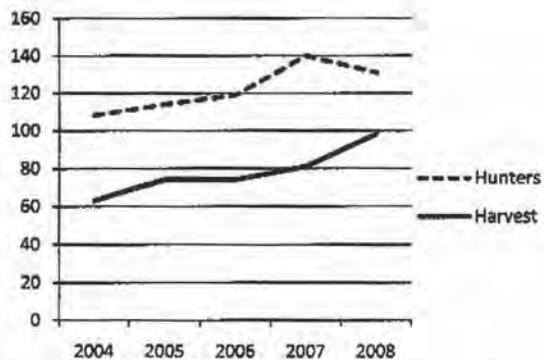


Figure 3. Unit 63 pronghorn harvest and hunter numbers for controlled hunts from 2004 through 2008.

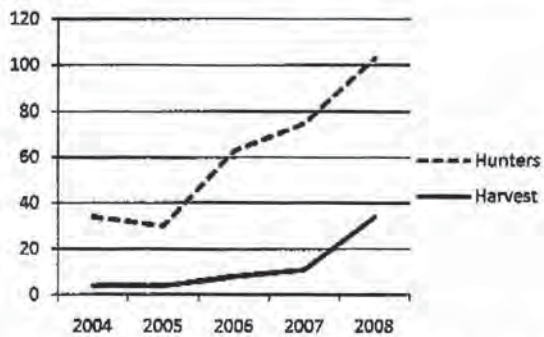
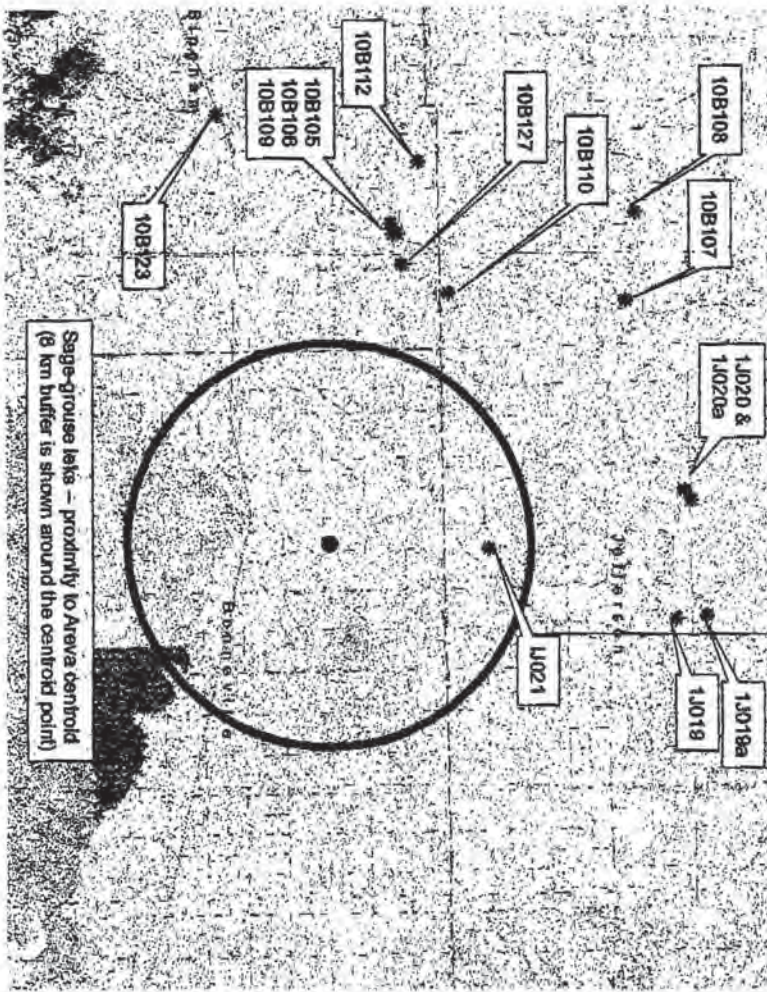


Figure 4. Unit 63 pronghorn harvest and hunter numbers for general season archery hunts from 2004 through 2008.



Location of known sage-grouse leks and 8km radius buffer associated with the center coordinates provided for the proposed Areva Uranium enrichment facility. Prepared for the Nuclear Regulatory Commission data request by Idaho Department of Fish and Game, 3 August 2009



**Lemont, Stephen**

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**From:** Lemont, Stephen  
**Sent:** Wednesday, February 10, 2010 8:56 AM  
**To:** 'sharon.kiefer@idfg.idaho.gov'  
**Cc:** Biwer, Bruce; Van Lonkhuyzen, Robert A.  
**Subject:** Continuing NRC Coordination with IDFG Regarding Ecological Issues for AREVA Eagle Rock Enrichment Facility Environmental Impact Statement  
**Attachments:** ID\_Fish\_Game\_response 080409.pdf; ID\_Fish\_Game\_request 012209.pdf; AES-O-NRC-10-00263 EREF Supplemental Info Trans Line\_with\_figure.pdf

Sharon W. Kiefer  
Assistant Director-Policy  
Idaho Department of Fish and Game  
600 South Walnut  
P.O. Box 25  
Boise, Idaho 83707

Dear Ms. Kiefer:

I am Steve Lemont, the U.S. Nuclear Regulatory Commission's (NRC's) new Project Manager for the Environmental Impact Statement (EIS) that NRC is preparing in support of its licensing action for the proposed AREVA Enrichment Services LLC (AREVA) Eagle Rock Enrichment Facility (EREF) located in Bonneville County, Idaho. Thank you for your August 4, 2009 letter in response to NRC's letter of June 22, 2009, in which the NRC requested information regarding threatened or endangered species and critical habitats at the proposed EREF project site. In your letter, you responded to the general questions we posed, but stated that the Idaho Fish and Game (IDFG) staff would need more specific project information in order to consider and assess impacts of the proposed facility to fish, wildlife, and habitats. Copies of the above referenced IDFG and NRC letters are attached for your reference.

We apologize for not getting back to you sooner regarding the request made in your letter, but there have been a number of changes here and also on the EREF project as discussed below. The purposes of this email are to follow up with IDFG regarding the proposed EREF project, to: (1) provide you with the information you requested in your August 4, 2009 letter; (2) inform you of a change to the EREF project scope involving the addition of an electrical transmission line to power the facility; and (3) request additional information from IDFG for the EREF project site, as well as information for the transmission line route, similar to that requested previously for the EREF site.

NRC requests that you provide IDFG's response to NRC's information request below within 30 days of this email if possible.

Information Requested in August 4, 2009 Letter from IDFG

In response to your August 4, 2009 letter, the information you requested can be found in the NRC website for the EREF project, at <http://www.nrc.gov/materials/fuel-cycle-fac/arevanc.html>. Specifically, the Environmental Report (ER) that AREVA submitted to NRC for the EREF project (Environmental Report, Rev. 1, April 2009) contains information on the entire uranium enrichment facility project (see at <http://www.nrc.gov/materials/fuel-cycle-fac/eagle-rock.html>), with the information you requested contained in the following sections of the ER:

- Section 2.1.2 provides the location and a detailed description of the proposed site and facility.
- Section 3.1 describes the land use of the site.
- Section 3.5 describes the ecological resources of the site.
- Section 4.4 contains a description of the retention and detention basins.
- Section 4.5 describes the potential impacts to ecological resources.
- Sage Grouse Survey Report (Environmental Report, Field Study, Sage Grouse Survey Report).

If you have any problems accessing the above information or need additional information or clarifications, please let me know.

#### Electrical Transmission Line to Power the EREF

Electrical service beyond that currently existing near the proposed EREF would be required to operate the EREF. AREVA submitted supplemental information to NRC dated January 29, 2010, which shows the location of the proposed 161-kilovolt transmission line and associated structures (e.g., substations and substation upgrades), and provides information regarding its construction and operation and environmental impacts (including ecological resources). That supplemental information is also attached to this email. The transmission line is part of the proposed EREF project, and the environmental impacts of the construction and operation of this line will be addressed in the EREF EIS.

The new transmission line and associated structures would be located entirely on private property within Bonneville County. Rocky Mountain Power (RMP), a division of PacifiCorp, will be the builder, owner, and operator. The line would originate from the existing RMP Bonneville Substation and extend in a general westward direction to the new point of service, the Twin Buttes Substation on the proposed EREF site. Beginning at the Bonneville Substation, the proposed transmission line route is west along the county road (West 65 North Street) to the existing RMP Kettle Substation, a distance of approximately 14.5 kilometers (9 miles), continuing west to the eastern portion of the EREF site, a distance of approximately 1.2 kilometer (0.75 mile), then north within the EREF site to its northern end, then west and south to the new RMP Twin Buttes Substation, for a distance of approximately 6.4 kilometers (4 miles). The area being affected by the transmission line is approximately 84 hectares (208 acres).

#### Request for Additional Information

In accordance with our letter dated June 22, 2009, NRC requests additional information from IDFG for the EREF site, on the items listed below, beyond that provided with your August 4, 2009 letter. In addition, NRC requests information on the items listed below within the action area of the proposed transmission line and associated structures as well.

- Endangered or threatened species, or other species of concern to the State of Idaho, that are known to be or likely to be present, and nearest known locations based on the element occurrence database. Habitat in these areas consists of sagebrush steppe, post-fire plantings (crested wheatgrass and other grasses), and irrigated crops.
- Nearest known lek sites (based on the element occurrence database), nesting habitat, brood-rearing habitat, and winter habitat for greater sage grouse, migratory status of the local population, the number of leks near the site, and trends.
- Information on sensitive or rare habitats in the project vicinity.
- Information on mule deer, pronghorn, and elk herds, including seasonal habitat (such as crucial winter habitat areas), and local migration routes.
- Important migration routes for birds.
- Maps or GIS shapefiles regarding species or habitats.
- Concerns of IDFG regarding potential impacts of the proposed project.

Please contact me if you have any questions or need additional information. My contact information is provided below. The NRC appreciates your assistance and cooperation in this matter.

Thank you.

Sincerely,  
Steve Lemont

*Stephen Lemont, Ph.D.*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs

Mail Stop: T-8F5

Washington, DC 20555-0001

Telephone: 301-415-5163

Fax: 301-415-5369

Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)



## Lemont, Stephen

---

**From:** Hebdon,Lance [lance.hebdon@idfg.idaho.gov]  
**Sent:** Wednesday, April 14, 2010 3:07 PM  
**To:** Lemont, Stephen; Kiefer,Sharon  
**Cc:** Vecellio,Gary; Kemner,Don; Biwer, Bruce  
**Subject:** RE: Sage-grouse Work by Wildlife Conservation Society

Steve-

During the conference call reference was made to some sage-grouse work being conducted by the Wildlife Conservation Society (WCS) in the vicinity of the project. We made a commitment to follow-up with and determine if the information being collected would be useful for inclusion in our comments on the AREVA project. The information being collected by the WCS is still preliminary and did not add information that would change our comments. Therefore you will not see any reference to their data. If you have questions feel free to contact me.

Lance

**Lance Hebdon**  
**Inter-Governmental Policy Coordinator**  
**Director's Office**  
**Idaho Department of Fish and Game**  
**208-287-2711**  
[lance.hebdon@idfg.idaho.gov](mailto:lance.hebdon@idfg.idaho.gov)

---

**From:** Lemont, Stephen [mailto:Stephen.Lemont@nrc.gov]  
**Sent:** Monday, March 15, 2010 2:41 PM  
**To:** Kiefer,Sharon  
**Cc:** Hebdon,Lance; Vecellio,Gary; Kemner,Don; Hemker,Tom; Biwer, Bruce  
**Subject:** RE: Teleconference to Discuss Greater Sage-grouse Issues Related to the AREVA Eagle Rock Uranium Enrichment Facility Project, Bonneville County, Idaho

How about 9:00 am Mountain Time? I will provide the bridge line after you confirm. How many lines will you need?

---

**From:** Kiefer,Sharon [sharon.kiefer@idfg.idaho.gov]  
**Sent:** Monday, March 15, 2010 11:42 AM  
**To:** Lemont, Stephen  
**Cc:** Hebdon,Lance; Vecellio,Gary; Kemner,Don; Hemker,Tom  
**Subject:** RE: Teleconference to Discuss Greater Sage-grouse Issues Related to the AREVA Eagle Rock Uranium Enrichment Facility Project, Bonneville County, Idaho

Mr. Lamont – would Wednesday morning, (3/17) preferably before 10 am work? If you will provide me the bridge line, I will make sure that our headquarters and Upper Snake regional staff have the number to call in.

---

**From:** Lemont, Stephen [mailto:Stephen.Lemont@nrc.gov]  
**Sent:** Friday, March 12, 2010 10:42 AM  
**To:** Kiefer,Sharon  
**Cc:** Hebdon,Lance; Biwer, Bruce M.; Van Lonkhuyzen, Robert A.  
**Subject:** Teleconference to Discuss Greater Sage-grouse Issues Related to the AREVA Eagle Rock Uranium Enrichment Facility Project, Bonneville County, Idaho

Dear Ms. Kiefer:

The purpose of this email is to request a teleconference with your agency to discuss questions the U.S. Nuclear Regulatory Commission (NRC) and its contractor, Argonne National Laboratory (Argonne), have regarding the recent U.S. Fish and Wildlife Service Greater Sage-grouse decision as it relates to the proposed AREVA Eagle Rock uranium enrichment facility project and associated proposed electrical transmission line in Bonneville County. My last contact with you was in an email dated February 10, 2010, regarding NRC's continuing coordination with the Idaho Department of Fish and Game (IDFG) on ecological issues for the Environmental Impact Statement (EIS) that the NRC is preparing in support of its licensing action for the AREVA Eagle Rock project. We understand that Mr. Lance Hebdon of IDFG is working on responding to the information requests in that email, and we very much appreciate that effort. With regard to the sage grouse, this includes information such as the local population in the vicinity of the proposed AREVA facility and transmission line and what areas that population uses for seasonal habitat.

Regarding the teleconference, we would like to ask about IDFG's thoughts and concerns for Eastern Idaho regarding the recent sage grouse decision, and about any suggestions, requirements and/or management guidelines you may have regarding the impacts, if any, of the proposed AREVA Eagle Rock project and transmission line on the sage grouse.

Please let me know your availability (dates and times) for a conference call next week to discuss the above matters. I will provide a bridge line for the call. In addition to myself, call participants on my end will be Bruce Biwer, the Argonne Project Manager for the Eagle Rock EIS, and Bob Van Lonkhuyzen, Argonne's ecological lead.

I look forward to hearing back from you soon.

Thanks,  
Steve Lemont

*Stephen Lemont, Ph.D.*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
Telephone: 301-415-5163  
Fax: 301-415-5369  
Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)



**Lemont, Stephen**

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**From:** Kiefer, Sharon [sharon.kiefer@idfg.idaho.gov]  
**Sent:** Wednesday, April 14, 2010 6:38 PM  
**To:** Lemont, Stephen; bmbiwer@anl.gov  
**Cc:** Hebdon, Lance; Vecellio, Gary  
**Subject:** IDFG Response to NRC AREVA Supplemental Request  
**Attachments:** E-mail from NRC to Sharon Kiefer regarding additional AREVA project information  
2-10-2010.txt; Response to NRC AREVA transmission supplemental request Mar 2010.docx

Steve, I apologize for a bit of delay in our information response to your request. Please contact Gary, Lance or I if there are any questions or clarifications needed. We appreciated the telephone discussion regarding sage-grouse and other issues.

Sharon W. Kiefer  
Idaho Department of Fish and Game  
*Assistant Director-Policy*  
[sharon.kiefer@idfg.idaho.gov](mailto:sharon.kiefer@idfg.idaho.gov)  
*please note new email address!!*  
208.334.3771  
P.O. Box 25  
Boise, ID 83707

The Idaho Department of Fish and Game (Department) is providing this information in response to a February 10, 2010 request by Stephen Lamont of the Nuclear Regulatory Commission (NRC) to Sharon Kiefer. These items are provided in supplement to the responses provided by the Department on August 4, 2009. This response incorporates potential issues related to a power line to service the infrastructure, which was not identified in 2009.

Sensitive and rare habitats or threatened species (power line only, site information previously provided)

Department staff considers the areas both north and south of your proposed power line to be important habitat for lek development, rearing, and migration of sage grouse. It is likely that a new above-ground transmission line will cause direct mortality of migrating sage grouse due to grouse striking the lines during flight. The locations of sensitive species from the Idaho Natural Heritage Database and occupied sage-grouse habitats in the vicinity of the proposed right-of-way for the power line are depicted in Figure 1. Department staff is unaware of any federally-listed species within the bounds of the project.

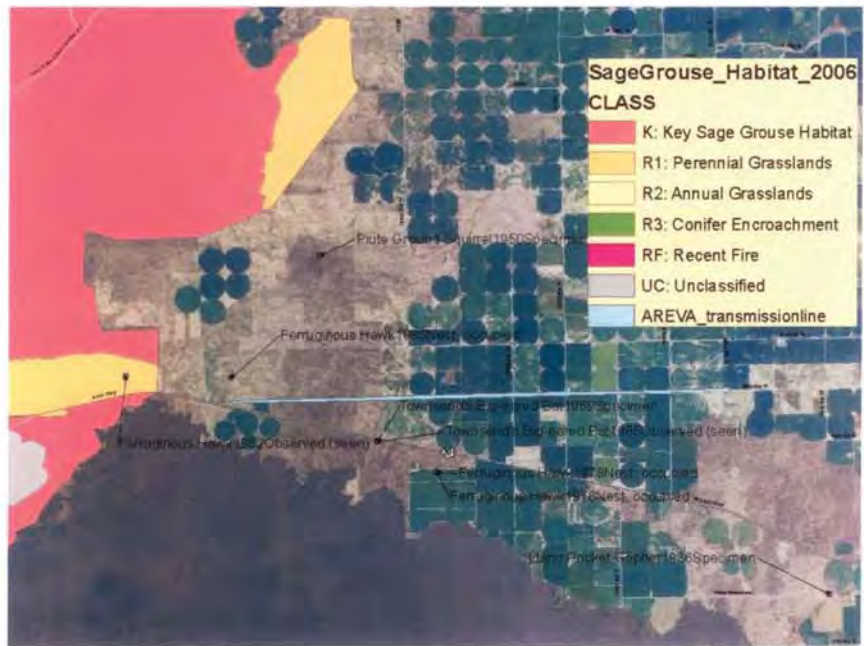


Figure 1. Location of sensitive species records from the IDFG Natural Heritage database and Sage-grouse habitat in proximity to the proposed AREVA transmission line.

Important migration routes for birds (power line only)

The addition of a power line, or an array of suspended lines will likely cause direct mortality of sage- and sharp-tailed grouse. As grouse fly across Highway 20 and over traffic during daily or seasonal migrations, we anticipate direct mortality of these birds due to collisions with newly-erected power lines. We request consideration of burying the new sections of line – this would be the most direct and effective way to avoid potential adverse effects to sage-grouse (and other flying and migrating wildlife). Power line burial has proven feasible to protect migrating sage grouse in Clark County near Small, Idaho as negotiated and constructed in 2007. This recommendation is consistent with the Idaho Sage-Grouse Conservation Plan which recommends avoiding construction of new power lines in grouse habitat or burying the line (Idaho Sage-Grouse Advisory Committee 2006) and is consistent with Department scoping comments for the Mountain States Transmission Intertie Project (available on request). If NRC and the applicant deem that it is not possible to bury the line, the Department requests that the licensee submit a proposal to the Department and USFWS describing:

- 1) How the line will be marked with high-visibility deflectors to reduce collisions by birds and bats,
- 2) How the licensee will survey the new line for the first 5 years to detect and record any sage- and sharp-tailed grouse mortality, and
- 3) How the licensee will mitigate for the direct loss of birds due to power line construction.

Concerns of the Department regarding potential wildlife effects of the proposed project

The Department has considered both the uranium enrichment plant and the (single) proposed power line identified in the latest version of the application. If constructed as proposed there will be various negative effects to wildlife and their habitats, as well as potential losses of public recreation benefits and use of some public lands. The Department offers the following as our assessment of likely impacts due to the project, and we request in order of preference that NRC require in the license that:

- The licensee to take measures to avoid and reduce wildlife and wildlife-related recreation impacts and subsequently,
- The licensee be required to fully mitigate for unavoidable wildlife, habitat, and wildlife-related recreational impacts due to project construction and operation.

We believe consultation with the Department and other natural resource managers would ensure implementation of effective measures to avoid, reduce, and mitigate adverse wildlife effects and ask the NRC to support such an approach.

Sage-grouse and sharp-tailed grouse

One of the documents provided was a sage-grouse survey report (MWH 2008). The stated goal of the effort was to "determine if greater sage grouse leks were in the vicinity of the site." The survey was conducted during the week of May 5. The timing of this survey is so late that it is unlikely to have detected any leks that may have been present on the property. Additionally no efforts were made to identify other potential seasonal use (nesting or brood rearing) of the property by sage-grouse. We recommend that the consultants confer with Department biologists and adopt our techniques for lek searches and monitoring. To be useful, their grouse surveys should be repeated using more effective methods.



It is likely that the proposed project will directly impact year-round sage-grouse use through fence collision mortality and habitat loss associated with power line infrastructure (previously noted) and a fenced perimeter. Additionally, it is also likely that the proposed project will indirectly affect the adjacent available sage grouse habitat due to increased road access and human use, and increased noise disturbance.

Sharp-tailed grouse are known to exist in the area; therefore, it is likely the proposed project will have impacts to sharp-tailed grouse and sharp-tailed grouse habitat similar to that of sage grouse.

The proposed power line to the Bonneville substation will likely negatively impact sage and sharp-tailed grouse populations in the area by providing additional raptor and corvid (e.g., crows and ravens) perch sites.

#### Big game

The Department manages the following species classified as big game species, which may be impacted negatively by the project: Mule Deer, Elk, Moose, and Pronghorn Antelope. All of these species will be affected by losses of open (mainly private) range upon which to live and forage and the forage gleaned by open range or agricultural products produced as a function of the property's original uses. Any high fence or security perimeter fence will presumably exclude these species from access to native ranges or previously accessible agricultural habitats. However, because the actual lay-out of any perimeter fence is withheld, we are uncertain of the extent of wildlife/public exclusion through fencing or actual development. Increased noise and human disturbance will cause these species to avoid the site of the enrichment plant to an unknown degree or distance. We cannot determine at this time whether loss of this area for use by big game will cause animals to just shift to new range or actually cause other change to the herd (such as productivity, etc.).

#### Public Lands

The Department remains very concerned about the loss of public lands to wildlife and to wildlife-related recreation access due to the project. The Bureau of Land Management (BLM) owns and manages a parcel of land entirely within the project boundary. We are unclear about the ability of wildlife or humans to access this public land during project operation. If public land resides within a fenced area or an area of 'high security' and is inaccessible to big game or humans we would urge NRC to consider this land as permanently removed from public/wildlife use. We request that the licensee negotiate with BLM to replace similar acreage to be managed by BLM for multiple uses including wildlife habitat and human recreation. We urge NRC to necessitate this using an iterative process described below.

Similarly, the Department has concerns that human access to other surrounding BLM property for recreational use will be curtailed due to high security needs at this facility. Perhaps large wildlife will also have less access, or will be less willing to use public lands adjacent to the project due to project security or human activity. If wildlife avoid public lands surrounding the project due to noise, lights, roads, or human presence due to the facility, we urge NRC to require that the licensee study and disclose these effects, and fully mitigate for lands lost to wildlife due to project effects using the iterative process described below.

#### Cumulative effects of the project.

The Department has concerns that activities and developments anticipated by AREVA for operations at this site have not yet been identified. Original plans for this project were given to the public, and public support sought, when the project was depicted at a smaller scale than is currently requested. At a meeting on 18 June 2008 at IDFG offices in Idaho Falls, Department staff were told by AREVA that (1) only 30 megawatts (MW) of power would be necessary to operate this plant and (2) the water use would be equal to operation of 1 center pivot during growing season. We now see that (1) 78MW of power are required as is (2) "a dual redundant electrical supply utilizing separate feeders (*not one but two lines*) is required" (Eagle Rock Enrichment Facility Appendix H Environmental Report, Paragraph 1). As such, we find that AREVA continues to modify the project and to add project components that will cause impacts to fish, wildlife, or habitats. We understand that currently, only one power line is requested for permitting and licensing (from the Bonneville Substation to the Enrichment Plant), even though the Environmental Report describes a need for two power lines for redundancy. The Department remains concerned that post-licensing, a future action of AREVA will be to request another power line. We remain concerned that the cumulative effects of all of these incremental actions will combine to further negatively affect wildlife, habitats, and recreational human use to a degree not evaluated by requests for individual actions alone in the pre-licensing phase. The second powerline, if coming from the west, might have much higher impact to sage-grouse than the line identified to date.

We advise NRC to require complete identification of all anticipated activities (all power lines, new water rights, increased roads and traffic, lighting of the plant and surrounding desert, etc) so that the Department may assess the cumulative impacts and so that NRC may necessitate adequate protections and mitigations. We also recommend NRC include future actions be covered in the "Mitigated Protections" and mitigations license language suggested below.

#### Negotiated protections and mitigations

We recommend and ask that NRC adopt an approach in crafting this license similar to the iterative approach of Federal Energy Regulatory Commission (FERC) when licensing new hydroelectric facilities to require the licensee to collaborate with natural resources agencies to reach agreements to minimize and mitigate adverse effects to public trust resources as a condition of the license.

To advance successful negotiations of a package of adequate natural resource protections and commensurate mitigations, we ask NRC to devise a collaborative team to work with the licensee to include the Department. We offer that the Idaho Office of Species Conservation, the USFWS, and BLM would also be appropriate agency participants.

#### Citation

Idaho Sage-grouse Advisory Committee. 2006. Conservation Plan for the Greater Sage-grouse in Idaho. [http://fishandgame.idaho.gov/cms/hunt/grouse/conserve\\_plan/](http://fishandgame.idaho.gov/cms/hunt/grouse/conserve_plan/)



**Lemont, Stephen**

---

**From:** Lemont, Stephen  
**Sent:** Tuesday, June 08, 2010 2:57 PM  
**To:** 'Kiefer, Sharon'  
**Cc:** lance.hebdon@idfg.idaho.gov; 'gary.vecellio@idfg.idaho.gov'; Kemner, Don; 'tom.hemker@idfg.idaho.gov'; KAY Jim (AREVA NP INC); Biwer, Bruce; 'Van Lonkhuyzen, Robert A.'  
**Subject:** Additional Sage Grouse Information for AREVA Eagle Rock Project 060810

Sharon,

After I shared the Idaho Department of Fish and Game's April 14, 2010, comments on the subject project with AREVA, AREVA commissioned North Wind, Inc. to conduct a supplementary sage grouse survey for the Eagle Rock site and transmission line right-of-way. You can access the report for that study, dated May 13, 2010, via the following download link: <https://webapps.anl.gov/filetransfer/downloader/940198422265150/>. (NOTE: This download link is good only for 30 days from yesterday.) Also included in the download link are the reports of four other ecological surveys that are referenced in the North Wind report, some of which you may not have seen previously.

Please contact me if you have any questions or need additional information.

Regards,  
Steve

*Stephen Lemont, Ph.D.*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
Telephone: 301-415-5163  
Fax: 301-415-5369  
Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)

**From:** [Lemont, Stephen](#)  
**To:** [Hebdon, Lance](#)  
**Cc:** [Kiefer, Sharon](#); [Biewer, Bruce M.](#); [Van Lonkhuyzen, Robert A.](#)  
**Subject:** RE: Eagle Rock Enrichment Facility  
**Date:** Wednesday, September 08, 2010 10:04:31 AM  
**Attachments:** [Additional Sage Grouse Information for AREVA Eagle Rock Project.060810.msg](#)

---

Hi, Lance. Environmental Report (ER), Rev. 2 (AES, 2010) is a voluminous document that includes numerous appendices. In NRC's electronic document filing system, known as the Agencywide Documents Access and Management System (or ADAMS), this ER document is broken down into numerous parts. Publicly available portions of ER Rev. 2 are accessible electronically from NRC's public website for the AREVA Eagle Rock project, under License Application, at <http://www.nrc.gov/materials/fuel-cycle-fac/eagle-rock.html>. When you get to that web page, you will see a tabular listing of all the various parts of Rev. 2 of the license application, beginning with the parts of the Safety Analysis Report, Rev. 2. Scroll down to see the parts of Environmental Report, Rev.2; and web links to these are provided (i.e., click on the ADAMS Accession # (ML#) for each)..

I would like to point out that ER Rev. 2 is merely the original ER into which AREVA incorporated all the supplementary information it had provided to the NRC through approximately March/April 2010. I believe we already provided you with, or otherwise directed you to, all of the documentation relevant to ecology, but you are certainly free to look through what we have in the website. The supplementary sage grouse survey report that we directed you to in the attached email was provided by AREVA subsequent to, and therefore is not included in, ER Rev.2.

If you need additional assistance, please let me know.

Thanks,  
Steve

*Stephen Lemont, Ph.D.*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
Telephone: 301-415-5163  
Fax: 301-415-5369  
Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)

---

**From:** [Hebdon, Lance](mailto:lance.hebdon@idfg.idaho.gov) [<mailto:lance.hebdon@idfg.idaho.gov>]  
**Sent:** Wednesday, September 08, 2010 9:52 AM  
**To:** Lemont, Stephen  
**Cc:** Kiefer, Sharon  
**Subject:** Eagle Rock Enrichment Facility

Stephen-  
In reviewing the DEIS for the Eagle Rock Enrichment Facility I saw a reference to a

document cited as (AES, 2010) AREVA Enrichment Services, LLC. "Eagle Rock  
Enrichment Facility  
4 Environmental Report, Rev. 2." Bethesda, Maryland. April.

Would you be able to send me an electronic copy of the report or give me a link where I  
can download it?

Thank you for your assistance,  
Lance

**Lance Hebdon**  
**Inter-Governmental Policy Coordinator**  
**Idaho Department of Fish and Game**  
**208-287-2711**  
[lance.hebdon@idfg.idaho.gov](mailto:lance.hebdon@idfg.idaho.gov)

The attachment referred to in this document is included in Section B.1  
of Appendix B, directly preceding this document.

## B.2 National Historic Preservation Act Consultation

June 17, 2009

Ms. Janet Gallimore, Executive Director  
Idaho State Historical Society  
2205 Old Penitentiary Road  
Boise, Idaho 83712

SUBJECT: INITIATION OF THE NATIONAL HISTORIC PRESERVATION ACT SECTION 106  
PROCESS FOR AREVA EAGLE ROCK ENRICHMENT FACILITY

Dear Ms. Gallimore:

On December 30, 2008, AREVA Enrichment Services (AES) submitted an environmental report (ER) to the U.S. Nuclear Regulatory Commission (NRC). The ER is one part of an application for a license to authorize construction, operation, and decommissioning of a proposed uranium enrichment facility. The NRC is in the initial stages of developing an Environmental Impact Statement (EIS) for the proposed facility to be located near Idaho Falls, Idaho in Bonneville County. The facility, if licensed, would use a gas centrifuge enrichment technology to enrich the isotope uranium-235 in uranium hexafluoride up to 5 percent by weight. The EIS that NRC is preparing will document the environmental impacts associated with the construction, operation, and decommissioning of the proposed facility.

The proposed AES parcel is approximately 1,700 hectares (4,200 acres). In November 2008, AES commissioned an archeological survey of the facility's footprint which involves approximately 381 hectares (941 acres) of the total parcel. The report is attached along with a map showing the area of potential effect, as it appears in the AES ER. As a result of the surveys, AES recorded a number of isolated finds and concluded that one find (MW004) was potentially eligible for inclusion in the National Register of Historic Places. AES proposes minimizing any adverse impacts through a mitigation plan for this find.

In the ER, AES indicated their submission of the archeological surveys to your office. As required by 36 CFR 800.4(a), the NRC is requesting the views of the State Historic Preservation Officer on any further actions necessary to identify historic properties that may be affected by the construction, operation, and decommissioning of the proposed facility, including whether find MW004 should be included in the National Register of Historic Places.



J. Gallimore

2

We intend to use the EIS process to comply with Section 106 of the National Historic Preservation Act of 1966, as described in 36 CFR Part 800.8. After assessing information you provide, we will determine any additional actions that are necessary to comply with the Section 106 consultation process. If you have any questions or comments, or need any additional information, please contact Gloria Kulesa of my staff on 301-415-5308.

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015

Enclosure: Volume Report



September 16, 2009

Ms. Susan Pengilly  
Deputy State Historic Preservation Officer  
Idaho State Historical Society  
2205 Old Penitentiary Road  
Boise, Idaho 83712

SUBJECT: NOTIFICATION OF AN EXEMPTION REQUEST FROM U.S. NUCLEAR  
REGULATORY COMMISSION'S (NRC) REGULATED ACTIONS SUBMITTED  
BY AREVA ENRICHMENT SERVICES (AES)

Dear Ms. Pengilly:

On June 11, 2009, my staff sent a letter to the office of Idaho State Historical Society requesting input on identifying any cultural or historic properties that may be affected by the construction, operation and decommissioning of the proposed facility. We look forward to receiving your written feedback soon and will incorporate the details of your response within our environmental impact statement (EIS).

In addition, we want to communicate pertinent and new information to your office. On June 17, 2009, AREVA Enrichment Services (AES) requested an exemption that would allow them to commence certain activities prior to NRC's completion of its environmental review under Title 10 of the Code of Federal Regulations, Part 51 (10 CFR 51) and the Nuclear Regulatory Commission's issuance of a Materials License for the Eagle Rock Enrichment Facility under 10 CFR 70.

NRC's approval of the exemption would permit AES to undertake the following list of actions. These actions do not affect radiological health and safety or common defense and security. As such, NRC has determined that these activities do not require a license.

- Clearing, Grading and Erosion Control
- Excavation, Including Rock Blasting and Removal
- Construction of Storm Water Detention Pond, Highway Access and Site Roads
- Installation of Utilities, Storage Tanks and Fences
- Installation of Parking Areas, Construction Buildings, Offices, Warehouses and Guardhouses.

If approved, the exemption would allow AREVA to commence the above pre-construction activities before NRC completes its licensing determination. AREVA plans on performing this pre-construction work in September 2010. The approval to perform pre-construction does not equate to approval of a license to construct, operate and decommission a facility. AREVA assumes the risk of completing these activities and then not receiving a license to construct and operate the facility.

The pre-construction activities of both the environmental impacts above and construction of the facility will be considered in NRC's environmental impact statement which will be issued after pre-construction activities begin. We will continue to communicate with you regarding important issues for NRC to consider on assessing the environmental impacts of these pre-construction and construction activities.

NRC anticipates completing its review of the exemption request by mid December 2009. If approved, AES will supplement its Environmental Report to distinguish between the environmental impacts of the construction activities covered by the exemption and construction activities which will not be undertaken until after issuance of a license by the NRC. This supplement will allow NRC staff to consider the impacts of pre-construction in its cumulative impact analysis within the EIS.

Please respond by October 15, 2009 with any comments or concerns that you may have on this subject. If you have any questions or comments with regard to this request from AES, or need any additional information, please contact Mathews George of my staff on 301-415-7065.

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015

February 17, 2010

Janet Gallimore  
Executive Director and State Historic  
Preservation Officer  
Idaho State Historical Society  
2205 Old Penitentiary Road  
Boise, Idaho 83712

SUBJECT: CONTINUING CONSULTATION UNDER THE NATIONAL HISTORIC  
PRESERVATION ACT SECTION 106 PROCESS FOR THE PROPOSED  
AREVA EAGLE ROCK ENRICHMENT FACILITY

Dear Ms. Gallimore:

The U.S. Nuclear Regulatory Commission (NRC) previously contacted your office by letter dated June 17, 2009, informing you of the submittal by AREVA Enrichment Services LLC (AES) of an application to the NRC for a license to construct, operate and decommission a gas centrifuge uranium enrichment facility in Bonneville County, Idaho. The proposed facility, the Eagle Rock Enrichment Facility (EREF), would be located approximately 20 miles west of Idaho Falls. As discussed in our June 17, 2009 letter, NRC is developing an Environmental Impact Statement (EIS) for the proposed EREF. The purposes of the present letter are to inform you: (1) that the project scope has been modified to include the construction and operation of a 161-kilovolt (KV) electrical transmission line needed to power the proposed EREF; and (2) of a change to the Area of Potential Effect (APE) for the EREF site.

#### Transmission Line

On January 29, 2010, AES submitted supplemental information to NRC for the construction and operation of a proposed transmission line, an electrical substation, and substation upgrades. The submittal updates and supersedes AES' previous transmission line addendum dated December 4, 2009, (Supplemental Information, EREF Environmental Report, Appendix H, EREF 161-KV Transmission Line Project). A Cultural Resource Inventory report was included with the December 4, 2009, supplement. NRC understands that AES sent copies of both the December 4, 2009 and January 29, 2010, submittals to your office. The locations of the transmission line and substations are shown in AES' January 29, 2010, submittal. NRC's EIS for the proposed EREF will now include a discussion of the impacts associated with the construction and operation of the transmission line and associated substations. Likewise, our Section 106 consultation for the EREF project will expand to include the proposed transmission line right-of-way and other lands needed for this line and associated structures.

The new transmission line and associated structures would be located entirely on private land within Bonneville County. Rocky Mountain Power (RMP), a division of PacifiCorp, will be the builder, owner, and operator. The transmission line would originate from the existing RMP Bonneville Substation and extend in a general westward direction to the new point of service, the Twin Buttes Substation on the proposed EREF site. In AES' updated proposal, there will be no use of Bureau of Land Management and U.S. Department of Energy (Idaho National Laboratory) lands, as there was in AES' December 4, 2009, proposal.



Beginning at the Bonneville Substation, the proposed transmission line route is west along the county road (West 65 North Street) to the existing RMP Kettle Substation, a distance of approximately 14.5 kilometers (9 miles), continuing west to the eastern portion of the EREF site, a distance of approximately 1.2 kilometer (0.75 mile), then north within the EREF site to its northern end, then west and south to the new RMP Twin Buttes Substation, for a distance of approximately 6.4 kilometers (4 miles). The area being affected by the transmission line is approximately 84 hectares (208 acres).

As discussed above, as part of its December 4, 2009, supplement, AES commissioned an archeological survey of the APE associated with the transmission line and associated structures (see Cultural Resource Inventory). This survey, which identified nine sites that are recommended potentially eligible for inclusion on the National Register of Historic Places, encompassed a large area that included much of the area of the presently proposed transmission line shown in AES' January 29, 2010, submittal. However, to NRC's knowledge, none of the nine historic properties identified are within the presently proposed transmission line right-of-way. AES stated in its January 29, 2010, submittal that there are no cultural or historical resources along the proposed transmission line corridor.

#### EREF Project Site APE

Additionally, AES has indicated that the APE for the EREF project site has been modified. The original APE encompassed 240 hectares (597 acres). Based on an August 28, 2009, submission by AES to NRC, an additional 26 hectares (64 acres) was added to the main project APE, increasing the EREF project site APE to 265 hectares (656 acres). The additional acreage was surveyed by AES' archaeological contractor with no historic properties identified. NRC understands that AES provided your office with a copy of the report on this survey (Amendment to: A Class III Cultural Resource Inventory of the Proposed Eagle Rock Enrichment Facility, Bonneville County, Idaho, Western Cultural Resource Management, Inc., August 28, 2009).

If you have any questions regarding the project, or need additional information, please contact Stephen Lemont of my staff at 301-415-5163 or [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov).

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No: 70-7015



**Bruce M. Biwer**  
Environmental Systems Engineer  
Radiological Health Risk Section

**Environmental Science Division**  
Argonne National Laboratory  
9700 South Cass Avenue, Bldg. 240  
Argonne, IL 60439

1-630-252-5761 phone  
1-630-252-4624 fax  
bbiwer@anl.gov

April 16, 2010

Ms. Suzi Pengilly  
Idaho State Historic Preservation Office  
210 Main Street  
Boise, ID 83702

Dear Ms. Pengilly,

Enclosed are copies of the additional documents that you indicated were needed by your office to conduct a review of the proposed AREVA Eagle Rock Enrichment Facility (EREF) in Bonneville County. The documents included are:

- 1) details of the proposed 161-kV transmission line required to power the EREF as provided in the February 18, 2010 submittal from AREVA Enrichment Services LLC (AES) to the U.S. Nuclear Regulatory Commission (NRC), also included are a set of higher resolution figures of the proposed transmission line corridor that were provided by AES under separate cover,
- 2) the MW004 treatment plan and the analysis of obsidian artifacts in the February 19, 2010 submittal from AES to the NRC (Enclosures 2 and 3, respectively, in that document), and
- 3) the report "AMMENDMENT TO: A CLASS III CULTURAL RESOURCE INVENTORY OF THE PROPOSED EAGLE ROCK ENRICHMENT FACILITY BONNEVILLE COUNTY, IDAHO" that details the survey of the additional 64 acres on the EREF property.

Please contact Steve Lemont at the NRC (301-415-5163 or [stephen.lemont@nrc.gov](mailto:stephen.lemont@nrc.gov)) if you have any further questions.

Sincerely,

A handwritten signature in cursive script that reads "Bruce M. Biwer".

Bruce M. Biwer, Ph.D.  
Environmental Science Division

cc: S. Lemont, NRC  
D. O'Rourke, ANL  
R. Van Lonkhuyzen, ANL





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Janet L. Gallimore  
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Administration  
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Membership and Fund Development  
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Office: (208) 514-2310  
Fax: (208) 334-2774

Archaeological Survey of Idaho  
210 Main Street  
Boise, Idaho 83702-7264  
Office: (208) 334-3847  
Fax: (208) 334-2775

Historical Museum and Education Programs  
610 North Julia Davis Drive  
Boise, Idaho 83702-7695  
Office: (208) 334-2130  
Fax: (208) 334-4059

Historic Preservation Office  
210 Main Street  
Boise, Idaho 83702-7264  
Office: (208) 334-3861  
Fax: (208) 334-2775

Old Penitentiary and Historic Sites  
2445 Old Penitentiary Road  
Boise, Idaho 83712-8254  
Office: (208) 334-2844  
Fax: (208) 334-3225  
Statewide Sites  
- Franklin Historic Site  
- Pierce Courthouse  
- Rock Creek Station & Strucker Homesite

Public Archives and Research Library  
2205 Old Penitentiary Road  
Boise, Idaho 83712-8250  
Office: (208) 334-3356  
Fax: (208) 334-3198  
- Public Archives  
- Research Library  
- Oral History

North Idaho Office  
112 W. Fourth Street, Suite 7  
Moscow, ID 83843  
Office: (208) 882-1540  
Fax: (208) 882-1765

May 3, 2010

Stephen Lemont  
Nuclear Regulatory Commission  
Environmental Review Branch  
U.S. Nuclear Regulatory Commission  
Washington D.C., 20555-0001

RE: AREVA Eagle Rock Enrichment Facility, Bonneville County, Idaho

Dear Mr. Lemont:

Our office has received information on the expanded footprint, proposed 161 kV transmission line, and archaeological treatment plan for AREVA's proposed Eagle Rock Enrichment Facility in Bonneville County, Idaho. Our comments on each project component and associated document(s) are outlined below. We have also provided guidance on the next steps in the Section 106 review process.

1. **Expanded Footprint:** AREVA wishes to expand the originally proposed footprint for the enrichment facility by 64 acres. The expansion was surveyed by Western Cultural Resource Management and documented in a report dated August 28, 2009. Two sites and seven isolates were identified within the expansion area. We agree that sites AR-2 and AR-3 are not eligible for the National Register of Historic Places for the reasons stated in the report. Although not addressed in the report, we also recommend that the isolates (IF-19 through IF-25) are not eligible.

Before we can accept this report, however, we will need the following: 1) two copies of the report and site forms; and 2) maps showing the site locations attached to *each* site form. These requirements apply to this submission and any future archaeological reports and forms submitted to the Idaho SHPO. For backup and local reference, we send the second copy of the report and forms to the regional repository. In this case, we will send the second copy to the Museum of Natural History in Pocatello.

2. **Transmission Line:** We received a report and site forms completed by North Wind documenting archaeological survey of two proposed alternate routes for a transmission line to the planned Eagle Rock facility.



The Idaho State Historical Society is an Equal Opportunity Employer.

Stephen Lemont  
Page 2  
May 3, 2010

We found this report and the project proposal difficult to follow. To remedy this, we first recommend that the report be reformatted to discuss each alternate route separately with archaeological findings and potential effects described by route. The alternatives should be clearly marked on maps in the report.

As the preferred alternative is now known, it too can be shown on a map, and its specific findings and effects discussed in the report. It should be clearly pointed out that no federal land is involved in the preferred alternative, if that is still the case.

The environmental document presents good maps that should be included in the revised archaeological report. Also, the aerials recently sent showing the final surveyed areas (Figure 1, Sheet 1; Figure 1, Sheet 2, etc.) should be included in the revised report.

We will need to receive two copies of the revised report and two copies of each site form. A map should be attached to each site form. It appears that we do not have maps for isolate R1 and for archaeological sites R3 and R7. Archaeological site forms are filed separately from the IHSI forms, so we need a map attached to each.

What is NNR1? It appears on figure 13, but we cannot find any other reference to it.

**3. Treatment of Site MW004 and Analysis of Obsidian Artifacts:**

We support the proposed treatment of site MW004. We should receive two copies of the report that documents the investigations along with two copies of photographs and other appendices or attachments.

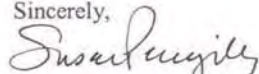
We appreciate receiving the letter report on the XRF analysis.

- 4. Next steps:** When the project design is finalized and all of the archaeological survey and site evaluations have been completed, the NRC should draft a Memorandum of Agreement (MOA) that outlines mitigation measures. The agreed upon Treatment Plan should be referenced as planned mitigation, and the XRF can be listed as completed mitigation. If monitoring is required, that too should be described in the MOA.

We will be happy to review a draft of the MOA. NRC also needs to notify the Advisory Council on Historic Preservation of the adverse effect and determine the Council's participation. If the Council chooses to not participate, NRC and our office will conclude the agreement with Argonne (and/or AREVA) as concurring parties. Mitigation documentation will then be sent to our office for review and acceptance.

Stephen Lemont  
Page 3  
May 3, 2010

We appreciate your cooperation. If you have any questions, please do not hesitate to call me at 208-334-3847, ext. 107.

Sincerely,  
  
Susan Pengilly  
Deputy SHPO and  
Compliance Coordinator

cc: Bruce M. Biwer, Ph.D., Environmental Science Division, Argonne National Laboratory

**From:** [Suzi Pengilly](#)  
**To:** [Lemont, Stephen](#)  
**Subject:** RE: NRC Letter to ACHP re: Adverse Effect to Historic Property and MOA for AREVA Eagle Rock Enrichment Facility, Bonneville County, Idaho  
**Date:** Wednesday, September 01, 2010 10:11:59 AM

---

The letter looks very thorough and complete. IT should be all they need, and they likely won't want to be involved, but you never know.

Thanks,  
Suzi.

---

**From:** Lemont, Stephen [mailto:[Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)]  
**Sent:** Wednesday, September 01, 2010 9:09 AM  
**To:** Suzi Pengilly  
**Cc:** Biver, Bruce M.; danourke@anl.gov; Van Lonkhuyzen, Robert A.  
**Subject:** NRC Letter to ACHP re: Adverse Effect to Historic Property and MOA for AREVA Eagle Rock Enrichment Facility, Bonneville County, Idaho

Hi, Suzi. Now that we've gotten past the completion of our Draft EIS and public meetings, the NRC staff has been able to prepare and send the subject letter to ACHP. You will be receiving a copy in the mail, but I have attached an advance copy for your reference. NRC is now in the process of drafting the MOA discussed in the letter.

By the way, thank you for your comments on our Draft EIS.

Regards,  
Steve

*Stephen Lemont, Ph.D.*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
Telephone: 301-415-5163  
Fax: 301-415-5369  
Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)

The attachment referred to in this document is provided later in Section B.2 of Appendix B. It is the letter to Mr. Reid Nelson, Director, Federal Agency Programs, Advisory Council on Historic Preservation, dated August 31, 2010.



**Biwer, Bruce M.**

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**From:** Lemont, Stephen [Stephen.Lemont@nrc.gov]  
**Sent:** Wednesday, September 29, 2010 12:21 PM  
**To:** Suzi Pengilly  
**Subject:** RE: Update on Section 106 Issues for the Proposed AREVA Eagle Rock Enrichment Facility Project in Bonneville County 092910

Suzi,

Do you still also need two copies of the expanded footprint report, including the site forms and maps?

Steve

*Stephen Lemont, Ph.D.*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
Telephone: 301-415-5163  
Fax: 301-415-5369  
Email: Stephen.Lemont@nrc.gov

---

**From:** Suzi Pengilly [mailto:Suzi.Pengilly@ishs.idaho.gov]  
**Sent:** Wednesday, September 29, 2010 12:21 PM  
**To:** Lemont, Stephen  
**Subject:** RE: Update on Section 106 Issues for the Proposed AREVA Eagle Rock Enrichment Facility Project in Bonneville County

Stephen,

Thank you for the update. With regard to the transmission line report, the only version that we have is dated December 4, 2009. Therefore, we still need two copies of the revised version.

Thanks,  
Suzi.

---

**From:** Lemont, Stephen [mailto:Stephen.Lemont@nrc.gov]  
**Sent:** Monday, September 27, 2010 10:12 AM  
**To:** Suzi Pengilly  
**Cc:** 'Biwer, Bruce M.'; O'Rourke, Daniel J.; Van Lonkhuyzen, Robert A.  
**Subject:** Update on Section 106 Issues for the Proposed AREVA Eagle Rock Enrichment Facility Project in Bonneville County

Suzi,

The purpose of this email is to follow up on your letter to me dated May 3, 2010 (see attached) and in so doing, provide you with an update on Section 106 activities by the U.S. Nuclear Regulatory Commission (NRC) for the proposed AREVA Eagle Rock Enrichment Facility (EREF) project. Also, I want to thank you for your July 22, 2010 comments on the Draft Environmental Impact Statement (EIS), which indicated your finding that the Historic and Cultural Properties sections accurately reflect the identification efforts conducted to date under Section 106 of the National Historic Preservation Act.



The discussion below follows the order of topics addressed in your May 3, 2010 letter, and includes some questions and issues to which I need your response:

1. **Expanded Footprint:** You requested two (2) copies of the August 28, 2009 report by Western Cultural Resource Management, including site forms and maps showing the site locations attached to each site form. I believe you are referring to the report, "Amendment to: A Class III Cultural Resource Inventory of the Proposed Eagle Rock Enrichment Facility, Bonneville County, Idaho," Prepared by Western Cultural Resource Management, Inc., August 28, 2009. The NRC does not have the requested maps so I plan to ask AREVA to send you the two copies of the report and site forms with the maps included. However, before I do that, please let me know if you still need these items.
2. **Transmission Line:** You also requested two (2) copies of the report on the transmission line portion of the project, including site forms, maps, and clarifications of various issues. The NRC does not have some of the requested items so I plan to ask AREVA to send you the two copies of the report with the additional items and any necessary clarifications included. However, before I do that, please note and/or respond to the following:
  - a. First, I want to point out that it appears from statements in your letter that you were not reviewing the most recent version of the cultural resource survey report for the proposed transmission line route. In January 2010, AREVA decided to drop and no longer consider the proposed transmission line coming from west of the proposed EREF site, which would have been located partially on lands of the Bureau of Land Management and Idaho National Laboratory. Thus, the proposed transmission line coming from the west is no longer part of the proposed EREF project. Accordingly, it was not addressed in the NRC's Draft EIS.
  - b. AREVA is currently proposing a single transmission line coming from the Bonneville Substation that is located east of the proposed EREF site, and has selected a route for that line that involves no Federal land. The archaeological and historical survey report on this single, preferred route was prepared by North Wind, Inc., and is dated January 21, 2010 ("Archaeological and Historic Survey Report, Archaeological Survey of Idaho. In: *Eagle Rock Enrichment Facility Transmission Line*," NWI 10247.001, Prepared by North Wind, Inc., January 21, 2010.). I thought AREVA had sent a copy of that report to your office.
  - c. Please let me know if you still need the two copies of North Wind's January 21, 2010 archaeological and historical survey report on the transmission line portion of the project, including site forms, maps, and clarifications (as necessary) of various issues.
3. **Treatment of Site MW004 and Analysis of Obsidian Artifacts:** Thank you for your support and acceptance of the proposed treatment of site MW004 and of the letter report of the XRF analysis of obsidian artifacts. The NRC has asked AREVA to provide your office with two copies of the requested report that documents the investigations associated with the treatment of site MW004, along with two copies of photographs and other appendices or attachments.
4. **Next steps:** As you know, in a letter dated August 31, 2010, the NRC notified the Advisory Council on Historic Preservation (ACHP) of the adverse effect on site MW004 and invited ACP to participate in the Section 106 consultation for the project. As I believe you also know, in a letter dated September 20, 2010, the ACHP responded that they do not believe that their participation in the consultation is needed at this time.

Also, the NRC is in the process of preparing a draft Memorandum of Agreement (MOA) for the project. I believe I mentioned during our conference call on July 19, 2010, that our legal counsel had developed a rough draft of the MOA. That rough draft is currently being revised by our legal counsel, after which it will be reviewed by NRC management. We will then send the MOA to your office and to the other parties for review. Please note that Argonne would not be a party to the MOA as they are serving only as consultant to the NRC for preparation of the EIS.

We also discussed during our July 19, 2010 conference call that The Shoshone-Bannock (S-B) Tribes would not be a party to the MOA because they have shown little interest in the project. However, based on a meeting that NRC staff had with the S-B Tribes on August 11, 2010 (the day before our public meeting on the Draft EIS in Idaho Falls) and on comments received from the tribes on the Draft EIS, the NRC is now considering inviting the S-B Tribes to be a concurring party on the MOA.

I look forward to receiving your responses to the questions and issues raised above. Please contact me if you have any questions or need additional information.

Thanks,  
Steve

*Stephen Lemont, Ph.D.*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
Telephone: 301-415-5163  
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Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)

The attachment referred to in this document is provided earlier in Section B.2 of Appendix B. It is the letter to Stephen Lemont, Nuclear Regulatory Commission, dated May 3, 2010.

**Biwer, Bruce M.**

---

**From:** Suzi Pengilly [Suzi.Pengilly@ishs.idaho.gov]  
**Sent:** Thursday, October 14, 2010 9:38 AM  
**To:** Lemont, Stephen  
**Cc:** Biwer, Bruce M.; O'Rourke, Daniel J.; Van Lonkhuyzen, Robert A.  
**Subject:** RE: Further Update on Section 106 Activities for the AREVA Eagle Rock Enrichment Facility Project 101410

Thank you for the update--  
suzi.

---

**From:** Lemont, Stephen [Stephen.Lemont@nrc.gov]  
**Sent:** Wednesday, October 13, 2010 2:20 PM  
**To:** Suzi Pengilly  
**Cc:** Biwer, Bruce M.; O'Rourke, Daniel J.; Van Lonkhuyzen, Robert A.  
**Subject:** Further Update on Section 106 Activities for the AREVA Eagle Rock Enrichment Facility Project

Hi, Suzi. This is to bring you up to date on the latest Section 106 activities for the subject project:

- As you may already know, AREVA's consultant began work last week on the mitigation of site MW006. It is my understanding that they are coordinating with Ken Reid of your office regarding the progress and interim findings of the mitigation work. I have asked AREVA to have their consultant prepare and submit a report on the mitigation, in accordance with the request in your May 3, 2010 letter; and AREVA has indicated their intention to do so.
- On October 8, 2010, the NRC sent a letter to The Shoshone-Bannock Tribes, inviting them to be a concurring party on the MOA. A copy of that letter is attached, although you will also be receiving a copy in the mail. On October 8, I gave Willie Preacher of the Tribes advance notice of this letter and what it is about.
- The NRC's attorneys are continuing to work on the draft MOA for the project.
- On October 11, 2010, I was informed by AREVA that the "expanded footprint" and "transmission line" reports and associated information requested in your May 3, 2010 letter were mailed out on that day. I had requested that they send the reports directly to you, but please keep on the lookout for them just in case they didn't. Please contact me if you don't receive the reports in the very near future. Also, if after you receive the reports you find that you have any questions or need additional information, please let me know. We look forward to receiving your comments on those reports.

Thanks,  
Steve

*Stephen Lemont, Ph.D.*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
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The attachment referred to in this document is provided later in Section B.2 of Appendix B. It is the letter to Chairman Small, the Shoshone-Bannock Tribes, dated October 8, 2010.



**Biwer, Bruce M.**

---

**From:** Suzi Pengilly [Suzi.Pengilly@ishs.idaho.gov]  
**Sent:** Monday, October 18, 2010 1:10 PM  
**To:** Lemont, Stephen  
**Cc:** Biwer, Bruce M.; O'Rourke, Daniel J.; Van Lonkhuyzen, Robert A.  
**Subject:** RE: Further Update on Section 106 Activities for the AREVA Eagle Rock Enrichment Facility Project 101810

I received the reports today, but have not looked at them. I will let you know if anything is missing.

---

**From:** Lemont, Stephen [<mailto:Stephen.Lemont@nrc.gov>]  
**Sent:** Wednesday, October 13, 2010 2:20 PM  
**To:** Suzi Pengilly  
**Cc:** Biwer, Bruce M.; O'Rourke, Daniel J.; Van Lonkhuyzen, Robert A.  
**Subject:** Further Update on Section 106 Activities for the AREVA Eagle Rock Enrichment Facility Project

Hi, Suzi. This is to bring you up to date on the latest Section 106 activities for the subject project:

- As you may already know, AREVA's consultant began work last week on the mitigation of site MW006. It is my understanding that they are coordinating with Ken Reid of your office regarding the progress and interim findings of the mitigation work. I have asked AREVA to have their consultant prepare and submit a report on the mitigation, in accordance with the request in your May 3, 2010 letter; and AREVA has indicated their intention to do so.
- On October 8, 2010, the NRC sent a letter to The Shoshone-Bannock Tribes, inviting them to be a concurring party on the MOA. A copy of that letter is attached, although you will also be receiving a copy in the mail. On October 8, I gave Willie Preacher of the Tribes advance notice of this letter and what it is about.
- The NRC's attorneys are continuing to work on the draft MOA for the project.
- On October 11, 2010, I was informed by AREVA that the "expanded footprint" and "transmission line" reports and associated information requested in your May 3, 2010 letter were mailed out on that day. I had requested that they send the reports directly to you, but please keep on the lookout for them just in case they didn't. Please contact me if you don't receive the reports in the very near future. Also, if after you receive the reports you find that you have any questions or need additional information, please let me know. We look forward to receiving your comments on those reports.

Thanks,  
Steve

*Stephen Lemont, Ph.D.*

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Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)

The attachment referred to in this document is provided later in Section B.2 of Appendix B. It is the letter to Chairman Small, the Shoshone-Bannock Tribes, dated October 8, 2010.

**From:** Lemont, Stephen [mailto:Stephen.Lemont@nrc.gov]  
**Sent:** Wednesday, January 26, 2011 10:01 AM  
**To:** Suzi Pengilly  
**Cc:** Biwer, Bruce M.; O'Rourke, Daniel J.; Van Lonkhuyzen, Robert A.  
**Subject:** Section 106 Consultation Update and Questions - AREVA Eagle Rock Enrichment Facility

Suzi,

This is to provide you with an update on the U.S. Nuclear Regulatory Commission's (NRC's) Section 106 consultation efforts and activities related to the proposed AREVA Eagle Rock Enrichment Facility (EREF) project in Bonneville County, and to ask you some questions regarding the process.

#### UPDATE

Following is an update on recent Section 106 efforts and activities for the subject project:

- On December 22, 2010, the Shoshone-Bannock Tribes accepted the NRC's invitation to be a concurring party on the Memorandum of Agreement (MOA) for the proposed EREF project.
- The NRC has developed a draft MOA that is currently undergoing internal review by our management and legal counsel. When that review is complete, which will be in the near term, it will be distributed by the NRC for review and comment, to the Idaho State Historic Preservation Office, AREVA, and the Shoshone-Bannock Tribes.
- The NRC is currently working on completing the Final Environmental Impact Statement (EIS) for the project, and will provide you with copies when it is completed. The Final EIS will provide updated information on impacts to historic and cultural resources and on associated mitigation, and will discuss that an MOA is being developed.

#### QUESTIONS

Please respond to the following questions related to the Section 106 process for the proposed EREF project:

1. Regarding the two hard copies of the "expanded footprint" and "transmission line" reports that AREVA sent to you in October 2010, you had indicated in earlier correspondence that you received those reports. Does your office have any comments on those reports, or are they acceptable as is?
2. AES provided other cultural resources survey reports and related documents, these are listed in Attachment A to this email (items 2 and 3 in the attachment are the "expanded footprint" and "transmission line" reports, respectively.) I believe that you are aware of, and have reviewed and accepted, all of the documents listed in Attachment A. However, do you still need two hard copies of, and/or do you have any concerns with, any of these reports.
3. I understand from AREVA that their archaeological consultant, Western Cultural Resource Management, Inc. (WCRM) was in contact with Dr. Kenneth Reid of your office throughout their professional excavation and data recovery activities at site MW004, and that WCRM sent Dr. Reid the attached letter report dated November 17, 2010 (Attachment B). In the first paragraph of your attached November 26, 2010 letter



to AREVA (Attachment C), you referenced a "data recovery report" that Dr. Reid reviewed and accepted for this project. With regard to that data recovery report:

- a. Is that report the WCRM letter report dated November 17, 2010 (i.e., Attachment B)?
- b. Did you receive from AREVA the two hard copies of that report that you requested in your November 26, 2010 letter?
- c. Does your statement in your November 26, 2010 letter regarding Dr. Reid's acceptance of the data recovery report constitute your office's approval that the site MW004 mitigation has been completed to your office's satisfaction?
- d. If Dr. Reid does, in fact, consider the site MW004 mitigation to be complete, can you please send me a letter to that effect?

I look forward to hearing back from you on this update and on receiving your responses to my questions. If you need additional information, please let me know.

Thanks,  
Steve

*Stephen Lemont, Ph.D.*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
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Fax: 301-415-5369  
Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)

**Attachment A**  
**Cultural Resource Reports and Documents Provided by AREVA**  
**for the Eagle Rock Enrichment Facility Project**

1. A Class III Cultural Resource Inventory of the Proposed Eagle Rock Enrichment Facility, Bonneville County, Idaho (Volume I: Report and Volume II: Cultural Resource Documentation). Prepared by Western Cultural Resource Management, Inc. November 21, 2008.
2. Amendment to: A Class III Cultural Resource Inventory of the Proposed Eagle Rock Enrichment Facility, Bonneville County, Idaho. Prepared by Western Cultural Resource Management, Inc. August 28, 2009. **NOTE: This is the "expanded footprint" report.**
3. Archaeological and Historic Survey Report, Archaeological Survey of Idaho. In: *Eagle Rock Enrichment Facility Transmission Line*. NWI 10247.001. Prepared by North Wind, Inc. January 21, 2010. **NOTE: This is the "transmission line" report.**
4. Letter to U.S. Nuclear Regulatory Commission from Jim A. Kay, Licensing Manager, AREVA Enrichment Services LLC. Subject: Response to Request for Additional Information - AREVA Enrichment Services LLC Environmental Report for the Eagle Rock Enrichment Facility - RAI 6.a. *Unanticipated Discovery Plan*. September 18, 2009
5. A Treatment Plan for Historic Site MW004 in the Area of the Proposed Eagle Rock Enrichment Facility, Bonneville County, Idaho. Prepared by Western Cultural Resource Management, Inc. January 28, 2010. (This includes the obsidian artifacts report at the end.)

***WCRM***

*WESTERN CULTURAL RESOURCE MANAGEMENT, INC.*

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November 17, 2010

Kenneth Reid, Ph.D.  
State Archaeologist  
Deputy State Historic Preservation Officer  
Idaho State Historical Society  
210 Main Street  
Boise, ID 83702

Dear Dr. Reid,

This letter is to summarize Western Cultural Resource Management's data recovery activities for the Eagle Rock Enrichment Facility Project located in Bonneville County, Idaho (west of Idaho Falls) and to request a notice-to-proceed for our client, AREVA Enrichment Services, LLC (AES). Data recovery was conducted by WCRM from October 5 to November 8, 2010, and is now complete.

*Project Background*

AES is preparing an application to the U.S. Nuclear Regulatory Commission (NRC) to construct, operate, and decommission a gas centrifuge uranium enrichment plant called the Eagle Rock Enrichment Facility in Bonneville County. WCRM conducted cultural resource inventories of the proposed project area in 2008 and 2009, surveying a total of 1,005 acres and identifying and recording 13 new archaeological sites and 25 isolated finds (Ringhoff et al. 2008; Estes and Raley 2009). One of the sites, MW04 (a historic homestead with a small prehistoric lithic scatter), was determined eligible to the National Register of Historic Places by the NRC under 36 CFR part 60.4, Criteria A and D. The State Historic Preservation Office (SHPO) concurred with this determination in a letter dated September 29, 2009.

WCRM prepared a data recovery plan detailing treatment recommendations to mitigate adverse impacts of the proposed facility to the eligible archaeological site, MW04 (Ringhoff and Stoner 2010). This plan also includes the collection of all known obsidian bifacial tools within the project so that they can be chemically sourced through x-ray fluorescence analysis, per the recommendation of the Idaho SHPO.

*Summary of Recommended and Completed Treatment*

Table 1 shows the recommended treatment described in the data recovery plan as well as what activities took place during the data recovery effort. Recommended treatment for site MW04 included mapping the entire site with a total station transit, collecting a representative sample of surface historic artifacts, excavating up to six 1 x 1 m units in Feature 1 (a dugout), doing a Class III+ artifact inventory of Feature 8 (a historic refuse concentration) as well as excavating one 1 x

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1 m unit in that feature, and excavating one 1 x 1 m unit in Feature 7 (a possible privy). Additionally, 11 obsidian bifacial tools from multiple sites and isolated finds in the project area were to be collected.

All treatment proposed in the data recovery plan was completed or attempted. Not all the obsidian tools could be relocated, but all other activities were completed at least to the extent described in the treatment plan. Additionally, the treatment of Feature 1 required more work than originally proposed due to the unexpected discovery of a wood floor. While only six excavation units were initially recommended for that feature, 27 units were ultimately excavated in order to expose the extent of the wood floor (see Figures 1-4).

Table 1. Recommended and Completed Treatment of Cultural Resources for the Eagle Rock Enrichment Facility Project

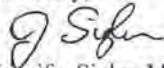
Location	Recommended Treatment	Completed Treatment
MW04 - General site	Detailed mapping of entire site using total station transit.	Detailed mapping of entire site using total station transit.
MW04 - General site	Collection of a representative sample of diagnostic historic artifacts.	Collection of a representative sample of diagnostic historic artifacts.
MW04 - Feature 1 (dugout)	Linear series of up to six 1 x 1 m units to be excavated by hand, with at least one placed outside the feature.	Grid of 27, 1 x 1 m units (including one placed outside the feature) excavated by hand. Initial 6 units placed in a line along middle of feature, with additional units added as necessary to expose entire extent of feature's wood floor (an unexpected discovery).
MW04 - Feature 7 (possible privy)	One 1 x 1 m unit placed over feature and excavated by hand to a sufficient depth to determine if feature is cultural.	One 1 x 1 m unit placed over feature and excavated by hand in ten arbitrary 10 cm deep levels, with a 1.25 m deep auger test placed at the bottom. No cultural materials were revealed.
MW04 - Feature 8 (historic refuse concentration)	Set up a surface grid of 1 x 1 m units to cover entire feature and do a Class III+ artifact inventory for each unit. Collect a representative surface sample of the feature's artifacts. Excavate by hand one 1 x 1 m unit to determine presence or absence of subsurface materials.	Set up a surface grid of twelve 1 x 1 m units to cover entire feature and did a Class III+ artifact inventory for each unit. Collected a representative surface sample of the feature's artifacts. Excavated by hand one 1 x 1 m unit to determine presence or absence of subsurface materials; no subsurface cultural materials were identified.
Multiple sites and IFs throughout the area previously inventoried by WCRM	Collect 11 obsidian bifacial tools.	Collected 4 of the 11 known obsidian bifacial tools; 7 could not be relocated. One previously unidentified tool was also found and collected, bringing the total number of obsidian tools collected up to 5.

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At this time, field work related to the treatment of cultural resources related to this project is complete. WCRM is preparing a detailed final report that will contain discussion and analysis of the results of the data recovery. We respectfully request that a notice-to-proceed be granted to the project proponent, AES.

If you have any questions or comments, feel free to call me (775-358-9003).

Sincerely,



Jennifer Sigler, M.A., RPA  
Project Manager  
WCRM, Inc.

Jim Kay (AES)  
Stacy Thomson (Areva NP)  
Tom Lennon (WCRM)

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Figure 1. Feature 1 during excavation, with bed frame on wood floor of dugout. View facing southwest.



Figure 2. Wood floor of dugout (Feature 1) exposed in its entirety. View facing south.

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Figure 3. Wood floor of dugout (Feature 1) exposed in its entirety. View facing west.



Figure 4. Feature 1 with all excavation completed. View facing east.

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NEVADA 50 FREEPORT BLVD., SUITE 15, SPARKS, NV 89431 775 358-9003 FAX 775 358-1387

## References Cited

Estes, Mark and Jaclyn Raley

- 2009 *Amendment To: A Class III Cultural Resource Inventory of the Proposed Eagle Rock Enrichment Facility, Bonneville County, Idaho.* Prepared by Western Cultural Resource Management, Inc., Sparks, Nevada for AREVA Enrichment Services, LLC, Bethesda, Maryland.

Ringhoff, Mary and Edward J. Stoner

- 2010 *A Treatment Plan for Historic Site MW04 in the Area of the Proposed Eagle Rock Enrichment Facility, Bonneville County, Idaho.* Prepared by Western Cultural Resource Management, Inc., Sparks, Nevada for AREVA Enrichment Services, LLC, Bethesda, Maryland.

Ringhoff, Mary, Edward J. Stoner, Collette Chambellan, and Steve Mehls

- 2008 *A Class III Cultural Resource Inventory of the Proposed Eagle Rock Enrichment Facility, Bonneville County, Idaho.* Prepared by Western Cultural Resource Management, Inc., Sparks, Nevada for AREVA Enrichment Services, LLC, Bethesda, Maryland.

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**Research Library**  
Office: (208) 334-2356  
Fax: (208) 334-3198

**Oral History**  
Office: (208) 334-3862  
Fax: (208) 334-3198

November 26, 2010

James A. Kay  
Licensing Manager  
AREVA  
Solomon Pond Park  
400 Donald Lynch Boulevard  
Marlborough MA 01752

RE: Geotechnical Borings at the Propose Twin Buttes Substation within Cultural Resource Site 10BV246 (MW004), Eagle Rock Enrichment Facility, Bonneville County, Idaho

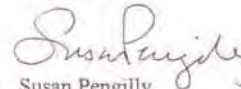
Dear Mr. Kay:

Thank you for requesting our views on geotechnical drilling within the boundaries of site 10BV246 (MW004) for the proposed Twin Buttes Substation. While Dr. Reid did review and accept the data recovery report for this project, *we will need two hard copies of the report sent to us in the mail. We do not accept reports via email.*

With this said, we agree that you can proceed with the geotechnical drilling at this location. As you know, however, we will need to have a fully signed Memorandum of Agreement from the Nuclear Regulatory Commission before construction of the facility can begin.

We appreciate your cooperation. If you have any questions, please feel free to contact me at 208-334-3847, ext. 107.

Sincerely,

  
Susan Pengilly  
Deputy SHPO and  
Compliance Coordinator

Cc: Stephen Lemont, NRC



The Idaho State Historical Society is an Equal Opportunity Employer.

August 31, 2010

Mr. Reid Nelson  
Director, Federal Agency Programs  
Advisory Council on Historic Preservation  
Old Post Office Building  
1100 Pennsylvania Avenue, Suite 803  
Washington, DC 20004

SUBJECT: NOTIFICATION OF ADVERSE EFFECT TO A HISTORIC PROPERTY AND  
ASSOCIATED MEMORANDUM OF AGREEMENT FOR PROPOSED AREVA  
ENRICHMENT SERVICES LLC EAGLE ROCK ENRICHMENT FACILITY  
PROJECT IN BONNEVILLE COUNTY, IDAHO

Dear Mr. Nelson:

With this letter, in accordance with 36 CFR 800.6(a)(1), the U.S. Nuclear Regulatory Commission (NRC) is notifying the Advisory Council on Historic Preservation (ACHP) of an adverse effect to site MW004 (John Leopard Homestead), as a result of the proposed AREVA Enrichment Services LLC (AES) Eagle Rock Enrichment Facility (EREF) project in Bonneville County, Idaho. The John Leopard Homestead is a *National Register of Historic Places* (NRHP)-eligible site. The NRC is drafting a Memorandum of Agreement (MOA) regarding the mitigation of the adverse effect to the John Leopard Homestead.

For your reference, this letter includes background on the NRC's activities pursuant to Section 106 of the *National Historic Preservation Act of 1966*, as amended (NHPA) to date, as well as a summary of the cultural resource information contained in the Draft Environmental Impact Statement (EIS) (NUREG-1945) for the proposed EREF. A copy of the EREF Draft EIS was provided to you by the NRC with a letter dated July 14, 2010 (Enclosure 1). In addition, the Draft EIS is available through the NRC's *Agencywide Documents Access and Management System* (ADAMS), at <http://www.nrc.gov/reading-rm/adams.html>. From this website, enter the Accession Number for the Draft EIS, ML101890384. The Draft EIS also may be accessed on the internet at <http://webwork.nrc.gov:300/reading-rm/doc-collections/nuregs/staff/sr1945/>.

Pursuant to 36 CFR 800.6(a)(1), the NRC staff invites the ACHP to participate in the NHPA Section 106 consultation for this project and requests your response within 15 calendar days of receipt of this letter and enclosures.

#### **BACKGROUND**

The NRC staff is reviewing an application submitted by AES for a license to construct, operate, and decommission a uranium enrichment facility, the proposed EREF, near Idaho Falls in Bonneville County, Idaho. AES submitted the original license application to the NRC on December 30, 2008. AES proposes to locate the facility in Bonneville County, Idaho, approximately 32 kilometers (20 miles) west of Idaho Falls. Revisions to the license application were submitted on April 23, 2009 (Revision 1), and April 30, 2010 (Revision 2). The proposed EREF, if licensed, would use a gas centrifuge process to enrich uranium-235 isotope found in natural uranium to concentrations up to 5 percent by weight. The enriched uranium would be



used to manufacture nuclear fuel for commercial nuclear power reactors. As part of the review of the application, the NRC has conducted an environmental review and prepared a Draft EIS, which includes an analysis of relevant environmental issues, including potential impacts on historic and cultural resources, and documents the NRC staff's preliminary determination regarding the environmental impacts from the preconstruction (e.g., site preparation), construction, operation, and decommissioning of the proposed EREF. The NRC is the lead Federal agency, in accordance with 36 CFR 800.1(a).

Note that many of the activities required to build a uranium enrichment facility (e.g., site clearing and grading, excavation, erection of fences, erection of support buildings) do not fall within the NRC's regulatory authority and, therefore, are not "construction" as defined by the NRC (see 10 CFR 51.4). Such activities are referred to as "preconstruction" activities in 10 CFR 51.45(c).

#### **SECTION 106 CONSULTATION**

By letter dated June 17, 2009 (Enclosure 2), the NRC staff initiated consultation under Section 106 of the NHPA with the Idaho State Historic Preservation Office (ID SHPO) concerning the proposed EREF project. Also, by the letter dated June 17, 2009 (Enclosure 2), and a supplemental letter dated February 17, 2010 (Enclosure 3), the NRC staff notified the ID SHPO that it will comply with its obligations under Section 106 of the NHPA, using the process set forth in 36 CFR 800.8(c). Pursuant to 36 CFR 800.8(c), the NRC staff is using the preparation of the EIS required by the *National Environmental Policy Act of 1969*, as amended (NEPA), to comply with its obligations under Section 106 of the NHPA. The NRC staff is using 36 CFR 800.8(c) in lieu of the procedures set forth in 36 CFR 800.3 through 36 CFR 800.6. As indicated below, consultation with the ID SHPO is ongoing.

In letters dated July 29, 2009 (Enclosure 4), and February 19, 2010 (Enclosure 5), the NRC staff also contacted the Shoshone-Bannock Tribes, identified as having potential interest in the proposed undertaking. To date, the Shoshone-Bannock Tribes have not responded to our consultation letters.

#### **DRAFT EIS PRELIMINARY FINDINGS**

To evaluate the potential impacts to historic and cultural resources resulting from the proposed EREF project, the NRC staff visited the proposed EREF site in June 2009, reviewed cultural resources survey reports prepared by AES's archaeological contractors, and conducted an independent historic and cultural resources records review. Preliminary findings regarding historical and cultural resources are summarized below and further discussed in the Draft EIS, Sections 3.3, 4.2.2, 4.2.16.2, and 4.3.2.

**NOTE: Enclosures 6, 7, 10 and 12 identified below contain sensitive information and are withheld from public disclosure.**

#### **Proposed EREF Project Site**

In the Draft EIS, the NRC staff presented its determination that the Area of Potential Effect (APE) for the NHPA Section 106 review of the proposed EREF project site is the 240-hectare (592-acre) portion of the proposed site that would be directly affected by preconstruction, construction, and operations activities. Two archaeological surveys have been undertaken by

an AES archaeological contractor for the proposed project site (Enclosures 6 and 7). The contractor directly examined 407 hectares (1005 acres) of the proposed AES property, within which the 240-hectare (592 acre) APE is included. The acreage surveyed included additional areas for expansion outside the presently proposed preconstruction, construction, and operations areas, which are no longer deemed necessary by AES for the proposed project.

Thirteen archaeological sites and 24 isolated finds were identified within the APE of the proposed EREF project site. Isolated finds are isolated occurrences of cultural resource material that are not associated with subsurface remains and are not considered archaeological sites. Three of the archaeological sites were prehistoric in age, six were from the historic era, and four contained evidence from both the historic and prehistoric periods. The prehistoric sites consisted of stone tools or evidence of stone tool manufacture. The historic sites were primarily historic trash scatters consisting of cans and glass. None of the isolated finds are considered eligible for listing on the NRHP. On the basis of the survey results, nine of the sites were recommended not eligible for listing on the NRHP. Site MW004, the John Leopard Homestead, is recommended eligible for listing on the NRHP for its potential to provide information on the practices of historic era farmers in the region. Several other sites of this type have been previously identified on Idaho National Laboratory property north of the proposed EREF site (see Enclosure 8), so removal of all sites of this type from the region is unlikely. Site MW004 consists of several structural remains including a cistern, privy and historic dugout house foundation. AES's archaeological contractor conducted additional research for the three other sites found during the survey and found that these sites lacked sufficient information to be considered significant (see Enclosure 6).

Site MW004 would be directly impacted by preconstruction of the proposed EREF. Preconstruction activities would destroy this site because it would be under the footprint of the proposed facility's security fence and an electrical substation for a transmission line that would bring power to the proposed EREF (see below). In a letter dated September 29, 2010 (Enclosure 9), the ID SHPO concurred with the evaluations and recommendations in the two AES survey reports, and agreed that site MW004 is the only one of the 13 sites located in the proposed EREF site eligible for listing on the NRHP, and recommended mitigation for the impacts to site MW004 to be included as stipulations in an MOA, discussed below.

#### **Proposed 161-kilovolt (kV) Transmission Line Project**

On January 19, 2010, AES informed the NRC of a license application change involving the addition to the proposed project of an electrical transmission line to power the proposed EREF. This new 161-kV transmission line would be run to the proposed EREF from Rocky Mountain Power's Bonneville Substation located to the east of the proposed EREF site, mostly along the right-of-way (ROW) of an existing 69-kV transmission line.

In the Draft EIS, the NRC staff presented its determination that the APE for AES's proposed 161-kV transmission line project is 202.3 hectares (500 acres) for the line itself. This is derived from the 22.12-kilometer (13.74-mile) proposed transmission line ROW length and 45.72 meters (150 feet) on either side of the centerline (91.4-meter [300-foot] total width). In addition to that, there is the fenced area at the proposed modified Bonneville Substation, which is 1.3 hectares (3.1 acres), and the proposed new Twin Buttes Substation that will occupy a 2.1-hectare (5.2-acre) fenced area on the proposed EREF site itself.



Portions of the proposed Twin Buttes Substation and of the proposed transmission line adjacent to the proposed EREF were surveyed previously as part of the survey for the main portion of the proposed EREF site (Enclosure 6). The ROW for the proposed transmission line has also been surveyed by an AES archaeological contractor for the presence of historical and cultural resources (Enclosure 10). This survey examined the 202.3-hectare (500-acre) APE. No historic and cultural resources were identified in these surveys. It is currently unclear whether additional areas would be needed for some aspects of the transmission line construction (e.g., pulling and tensioning sites). AES has provided an unanticipated discoveries and monitoring plan (Enclosure 11) to the NRC and Idaho SHPO, which will be in place during preconstruction and construction and which the NRC proposes to reference in the MOA.

#### MEMORANDUM OF AGREEMENT

As discussed above, during its environmental review and as documented in the Draft EIS, the NRC staff identified an adverse effect to the NRHP-eligible John Leopard Homestead (site MW004) located on the proposed EREF site. Preconstruction activities would destroy site MW004 because it would be under the footprint of the proposed EREF's security fence and an onsite electrical substation for the proposed 161-kV transmission line. In its letter dated September 29, 2009 (Enclosure 9), the ID SHPO recommended mitigation of the adverse effect through data recovery, historic research for the John Leopard Homestead site, and that all obsidian bifacial tools within the EREF project area be chemically traced to their geologic sources through x-ray fluorescence (XRF) analysis. Further, the ID SHPO stated that these mitigation measures should be drafted as stipulations in an MOA.

AES subsequently provided a Treatment Plan for site MW004 (Enclosure 12) that addresses the procedures that will be employed to conduct mitigation measures recommended by the ID SHPO. At the end of this plan is a letter that reports on the completed geochemical XRF analysis of obsidian artifacts collected at the ID SHPO's request (Letter to Kenneth Reid, State Archaeologist and Deputy State Historic Preservation Officer, Idaho State Historical Society, from Edward J. Stoner, Western Cultural Resource Management, Inc. December 18, 2009.). In a letter dated May 3, 2010 (Enclosure 13), the ID SHPO expressed its support for the proposed treatment of site MW004 and requested a report from AES that documents the investigations conducted as part of the mitigation along with photographs and other appropriate appendices and attachments.

The NRC is currently in the process of drafting an MOA as requested by the ID SHPO. As recommended in the ID SHPO's September 29, 2009, letter (Enclosure 9), AES's Treatment Plan (Enclosure 12) will be referenced with regard to the mitigation of site MW004; and as additionally stated in the ID SHPO's May 3, 2010, letter (Enclosure 13), the XRF analysis will be listed as completed mitigation, and any required monitoring will be described. Also, because AES has indicated that final design of the proposed EREF and associated 161-kV transmission line project will not be completed until after the NRC license is issued, the draft MOA will also address the survey by AES for historic cultural resources of any previously un-surveyed areas that may be identified following final design (e.g., transmission line construction pulling and tensioning sites). As such, AES's unanticipated discoveries and monitoring plan mentioned above (Enclosure 11) will be referenced in the draft MOA. The purpose of this plan is to: (1) monitor and protect existing and known archaeological sites and historic properties located within the proposed EREF site; (2) set forth the process for dealing with discoveries of human remains or previously unidentified archaeological sites that are discovered during activities that

R. Nelson

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cause surface or subsurface disturbances and may result in an irreversible loss of the resource; and (3) establish procedures for evaluation and treatment of unanticipated discoveries in accordance with 36 CFR 800.13.

Proposed signatories to this MOA will be the NRC, the ID SHPO, AES, and the ACHP, if it so chooses. Because the Shoshone-Bannock Tribes have not responded to our consultation letters, they are not included as either a signatory or concurring party.

As mentioned in the introduction to this letter, the NRC staff invites the ACHP to participate in the NHPA Section 106 consultation for this project pursuant to 36 CFR 800.6(a)(1) and requests your response within 15 calendar days of receipt of this letter and enclosures. If you have any questions or require additional information, please contact the Stephen Lemont, Senior Project Manager, at (301) 415-5163, or by email at [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov).

Sincerely,

/RA/

Diana Diaz-Toro, Chief  
Environmental Review Branch A  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015

Enclosures: See attached list

cc w/o enclosures: S. Pengilly, ID SHPO  
J. Kay, AES



#### LIST OF ENCLOSURES

1. Letter to Reid Nelson, Director, Office of Federal Agency Programs, Advisory Council on Historic Preservation, from D. Diaz-Toro, Chief, Environmental Review Branch A, Environmental Protection and Performance Assessment Directorate, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission. Subject: Section 106 Consultation, Notification of the Issuance of, and Request for Comments on the Draft Environmental Impact Statement for the Proposed AREVA Enrichment Services LLC Eagle Rock Enrichment Facility in Bonneville County, Idaho. July 14, 2010. ADAMS Accession No. ML101650142.
2. Letter to Janet Gallimore, Executive Director, Idaho State Historical Society, from Andrea Kock, Chief, Environmental Review Branch, Environmental Protection and Performance Assessment Directorate, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission. Subject: Initiation of the National Historic Preservation Act Section 106 Process for AREVA Eagle Rock Enrichment Facility. June 17, 2009. ADAMS Accession No. ML091660205.
3. Letter to Janet Gallimore, Executive Director and State Historic Preservation Officer, Idaho State Historical Society, from Andrea Kock, Chief, Environmental Review Branch, Environmental Protection and Performance Assessment Directorate, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission. Subject: Continuing Consultation under the National Historic Preservation Act Section 106 Process for the Proposed AREVA Eagle Rock Enrichment Facility. February 17, 2010. ADAMS Accession No. ML100471023.
4. Letter to Chairman Alonzo A. Coxy, The Shoshone Bannock Tribes, from Andrea Kock, Chief, Environmental Review Branch, Environmental Protection and Performance Assessment Directorate, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission. Subject: Initiation of the National Historic Preservation Act Section 106 Process for AREVA Eagle Rock Enrichment Facility. July 29, 2009. ADAMS Accession No. ML092090444.
5. Letter to Chairman Alonzo A. Coxy, The Shoshone Bannock Tribes, from Andrea Kock, Chief, Environmental Review Branch, Environmental Protection and Performance Assessment Directorate, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission. Subject: Continuing Consultation under the National Historic Preservation Act Section 106 Process for the Proposed AREVA Eagle Rock Enrichment Facility. February 19, 2010. ADAMS Accession No. ML100480141.



6. A Class III Cultural Resource Inventory of the Proposed Eagle Rock Enrichment Facility, Bonneville County, Idaho (Volume I: Report and Volume II: Cultural Resource Documentation). Prepared by Western Cultural Resource Management, Inc. November 21, 2008. ADAMS Accession Nos. ML101330115, ML101330103, ML101330104, ML101330106, ML101330107, ML101330108, ML101330109, ML101330110, ML101330125, ML101330112, ML101330113, and ML101330114. **NOTE: These documents contain sensitive information and are withheld from public disclosure.**
7. Amendment to: A Class III Cultural Resource Inventory of the Proposed Eagle Rock Enrichment Facility, Bonneville County, Idaho. Prepared by Western Cultural Resource Management, Inc. August 28, 2009. ADAMS Accession No. ML101330102. **NOTE: This document contains sensitive information and is withheld from public disclosure.**
8. Personal communication from Holly Gilbert, Idaho National Laboratory, to Daniel O'Rourke, Argonne National Laboratory. Subject: Uniqueness of Late 19<sup>th</sup> Century Homestead Sites in the General Vicinity of the EREF Property. April 26, 2010. ADAMS Accession No. ML101790310.
9. Letter to George A. Harper, Vice President, Engineering, Eagle Rock Enrichment Facility, AREVA Enrichment Services LLC, from Kenneth C. Reid, State Archaeologist and Deputy State Historic Preservation Officer, Idaho State Historical Society. Subject: Class III Cultural Resource Inventory of the Proposed Eagle Rock Enrichment Facility, Bonneville County, and amendment. September 29, 2009. ADAMS Accession No. ML092810293.
10. Archaeological and Historic Survey Report, Archaeological Survey of Idaho. In: *Eagle Rock Enrichment Facility Transmission Line*. NWI 10247.001. Prepared by North Wind, Inc. January 21, 2010. ADAMS Accession Nos. ML101330124 and ML101330101. **NOTE: These documents contain sensitive information and are withheld from public disclosure.**
11. Letter to U.S. Nuclear Regulatory Commission from Jim A. Kay, Licensing Manager, AREVA Enrichment Services LLC. Subject: Response to Request for Additional Information - AREVA Enrichment Services LLC Environmental Report for the Eagle Rock Enrichment Facility - RAI 6.a. Unanticipated Discovery Plan. September 18, 2009. ADAMS Accession No. ML092640684.
12. A Treatment Plan for Historic Site MW004 in the Area of the Proposed Eagle Rock Enrichment Facility, Bonneville County, Idaho. Prepared by Western Cultural Resource Management, Inc. January 28, 2010. ADAMS Accession No. ML100540693. **NOTE: This document contains sensitive information and is withheld from public disclosure.**
13. Letter to Stephen Lemont, Environmental Review Branch, Nuclear Regulatory Commission, from Susan Pengilly, Deputy SHPO and Compliance Officer, Idaho State Historical Society. Subject: AREVA Eagle Rock Enrichment Facility, Bonneville County, Idaho. May 3, 2010. ADAMS Accession No. ML101330126.



*Preserving America's Heritage*

September 20, 2010

Diana Diaz-Toro, Chief  
Environmental Review Branch A  
Environmental Protection and Performance Assessment Directorate  
Division of Waste Management and Environmental Protection  
Office of Federal and State Materials and Environmental Management Programs  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**Ref: Proposed Eagle Rock Enrichment Facility Project  
Bonneville County, Wyoming**

Dear Ms. Diaz-Toro:

On September 1, 2010, the Advisory Council on Historic Preservation (ACHP) received your notification regarding the adverse effects of the referenced undertaking on the John Leopard Homestead, which is eligible for listing in the National Register of Historic Places. Based upon the information you provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of our regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed at this time. However, if we receive a request for participation from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer, affected Indian tribe, consulting party, or other party, we may reconsider this decision. Should circumstances change, and you determine that our participation is needed, please notify us accordingly.

Pursuant to 36 CFR §800.6(b)(1)(iv), you will need to file the final Memorandum of Agreement (MOA), developed in consultation with the Idaho SHPO and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the MOA and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

Thank you for providing us with the opportunity to review this undertaking. If you have any questions, feel free to contact Tom McCulloch at 202-606-8554, or via email at [tmcculloch@achp.gov](mailto:tmcculloch@achp.gov).

Sincerely,

*Raymond V. Wallace*

Raymond V. Wallace  
Historic Preservation Technician  
Office of Federal Agency Programs

ADVISORY COUNCIL ON HISTORIC PRESERVATION  
1100 Pennsylvania Avenue NW, Suite 803 □ Washington, DC 20004  
Phone: 202-606-8503 □ Fax: 202-606-8647 □ [achp@achp.gov](mailto:achp@achp.gov) □ [www.achp.gov](http://www.achp.gov)

July 29, 2009

Chairman Alonzo A. Cohy  
The Shoshone-Bannock Tribes  
P.O. Box 306  
Fort Hall, ID 83203

SUBJECT: INITIATION OF THE NATIONAL HISTORIC PRESERVATION ACT SECTION 106  
PROCESS FOR AREVA EAGLE ROCK ENRICHMENT FACILITY

Dear Chairman Cohy:

On December 30, 2008, AREVA Enrichment Services (AES) submitted an environmental report (ER) to the U.S. Nuclear Regulatory Commission (NRC). The ER is one part of an application for a license to authorize construction, operation, and decommissioning of a proposed uranium enrichment facility. The NRC is in the initial stages of developing an Environmental Impact Statement (EIS) for the proposed facility to be located near Idaho Falls, Idaho in Bonneville County. The facility, if licensed, would use a gas centrifuge enrichment technology to enrich the isotope uranium-235 in uranium hexafluoride up to 5 percent by weight. The EIS that NRC is preparing will document the environmental impacts associated with the construction, operation, and decommissioning of the proposed facility.

The proposed AES parcel is approximately 1,700 hectares (4,200 acres). In November 2008, AES commissioned an archeological survey of the facility's footprint which involves approximately 381 hectares (941 acres) of the total parcel. The report is attached along with a map showing the area of potential effect, as it appears in the AES ER. As a result of the surveys, AES recorded a number of isolated finds and concluded that one find (MW004) was potentially eligible for inclusion in the National Register of Historic Places. AES proposes minimizing any adverse impacts through a mitigation plan for this find.

In the ER, AES indicated their submission of the archeological surveys to your office. As required by 36 CFR 800.4(a), the NRC is requesting the views of the tribe on any further actions necessary to identify historic properties that may be affected by the construction, operation, and decommissioning of the proposed facility, including whether find MW004 should be included in the National Register of Historic Places.



Chairman Cohy

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We intend to use the EIS process to comply with Section 106 of the National Historic Preservation Act of 1966, as described in 36 CFR Part 800.8. After assessing information you provide, we will determine any additional actions that are necessary to comply with the Section 106 consultation process. If you have any questions or comments, or need any additional information, please contact Mathews George of my staff on 301-415-7065.

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015

Enclosure: Volume Report

cc: Willie Preacher  
The Shoshone-Bannock Tribes

Stan Day  
AES Eagle Rock Enrichment Facility

George A. Harper, P.E.  
AES Eagle Rock Enrichment Facility

September 16, 2009

Chairman Alonzo A. Cohy  
The Shoshone-Bannock Tribes  
P.O. Box 306  
Fort Hall, ID 83203

SUBJECT: NOTIFICATION OF AN EXEMPTION REQUEST FROM U.S. NUCLEAR REGULATORY COMMISSION'S (NRC) REGULATED ACTIONS SUBMITTED BY AREVA ENRICHMENT SERVICES (AES)

Dear Chairman Cohy:

On July 29, 2009, U.S. Nuclear Regulatory Commission (NRC) staff sent a letter to the office of The Shoshone-Bannock Tribe. My staff requested input from the tribe on identifying any cultural or historic properties that may be affected by the construction, operation and decommissioning of the proposed facility. We look forward to receiving your written feedback soon and will incorporate the details of your response within our environmental impact statement (EIS).

In addition, we want to communicate pertinent and new information to your office. On June 17, 2009, AREVA Enrichment Services (AES) requested an exemption that would allow them to commence certain activities prior to NRC's completion of its environmental review under Title 10 of the Code of Federal Regulations, Part 51 (10 CFR 51) and the NRC's issuance of a Materials License for the Eagle Rock Enrichment Facility under 10 CFR 70.

NRC's approval of the exemption would permit AES to undertake the following list of actions. These actions do not affect radiological health and safety or common defense and security.

- Clearing, Grading and Erosion Control
- Excavation, Including Rock Blasting and Removal
- Construction of Storm Water Detention Pond, Highway Access and Site Roads
- Installation of Utilities, Storage Tanks and Fences
- Installation of Parking Areas, Construction Buildings, Offices, Warehouses and Guardhouses.

If approved, the exemption would allow AREVA to commence the above pre-construction activities before NRC completes its licensing determination. AREVA plans on performing this pre-construction work in September 2010. The approval to perform pre-construction does not equate to approval of a license to construct, operate and decommission a facility. AREVA assumes the risk of completing these activities and then not receiving a license to construct and operate the facility.



The pre-construction activities of both the environmental impacts above and construction of the facility will be considered in NRC's environmental impact statement which will be issued after pre-construction activities begin. We will continue to communicate with you regarding important issues for NRC to consider on assessing the environmental impacts of these pre-construction and construction activities

NRC anticipates completing its review of the exemption request by mid December 2009. If approved, AES will supplement its Environmental Report to distinguish between the environmental impacts of the construction activities covered by the exemption and construction activities which will not be undertaken until after issuance of a license by the NRC. This supplement will allow NRC staff to consider the impacts of pre-construction in its cumulative impact analysis within the EIS.

Please respond by October 15, 2009 with any comments or concerns that you may have on this subject. If you have any questions or comments with regard to this request from AES, or need any additional information, please contact Mathews George of my staff on 301-415-7065.

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015

cc:  
Willie Preacher  
The Shoshone-Bannock Tribes

Stan Day  
AES Eagle Rock Enrichment Facility

George A Harper, P.E.  
AES Eagle Rock Enrichment Facility

February 19, 2010

Chairman Alonzo A. Cohy  
The Shoshone-Bannock Tribes  
P.O. Box 306  
Fort Hall, Idaho 83203

SUBJECT: CONTINUING CONSULTATION UNDER THE NATIONAL HISTORIC  
PRESERVATION ACT SECTION 106 PROCESS FOR THE PROPOSED  
AREVA EAGLE ROCK ENRICHMENT FACILITY

Dear Chairman Cohy:

The U.S. Nuclear Regulatory Commission (NRC) previously contacted you by letter dated July 29, 2009, informing you of the AREVA Enrichment Services LLC (AES) submittal of an application to NRC for a license to construct, operate, and decommission a gas centrifuge uranium enrichment facility in Bonneville County, Idaho, and NRC's preparation of an Environmental Impact Statement (EIS) in support of its licensing action for the facility. The proposed facility, the Eagle Rock Enrichment Facility (EREF), would be located about 20 miles west of Idaho Falls. The purpose of this letter is to inform you that the scope of the project has been modified to include the construction and operation of an electrical transmission line and associated structures needed to power the proposed EREF.

On January 29, 2010, AES submitted supplemental information to NRC for the construction and operation of a proposed transmission line, an electrical substation, and substation upgrades. The locations of the transmission line and substations are shown in the January 29, 2010, submittal, a copy of which is enclosed. Also, AES commissioned an archeological survey of the area of potential effect (APE) associated with the transmission line route; the Idaho State Historic Preservation Officer has a copy of the survey report. As discussed in AES' January 29, 2010, submittal, no historic properties were identified in the APE of the proposed transmission line project. NRC's EIS for the proposed EREF will include a discussion of the impacts associated with the construction and operation of this transmission line project. Likewise, NRC's Section 106 consultations for the EREF project will expand to include cultural resources along the proposed transmission line right-of-way.

The new transmission line and associated structures would be located entirely on private land within Bonneville County. Rocky Mountain Power (RMP), a division of PacifiCorp, will be the builder, owner, and operator. The transmission line would originate from the existing RMP Bonneville Substation and extend in a general westward direction to the new point of service, the Twin Buttes Substation on the proposed EREF site. Beginning at the Bonneville Substation, the proposed transmission line route is west along the county road (West 65 North Street) to the existing RMP Kettle Substation, a distance of approximately 14.5 kilometers (9 miles), continuing west to the eastern portion of the EREF site, a distance of approximately 1.2 kilometer (0.75 mile), then north within the EREF site to its northern end, then west and south to the new RMP Twin Buttes Substation, for a distance of approximately 6.4 kilometers (4 miles). The area being affected by the transmission line is approximately 84 hectares (208 acres).

A. Cohy

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As noted in our earlier letter, NRC intends to use the EIS process to comply with Section 106 of the National Historic Preservation Act, as described in 36 CFR Part 800.8. As required by 36 CFR 800.4(a), NRC is requesting the views of the tribes on any further actions necessary to identify historic properties that may be affected by the construction and operation of the proposed transmission line and associated structures. After assessing information you provide, we will determine any additional actions that are necessary to comply with the Section 106 consultation process.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions regarding the project, or need additional information, please contact Stephen Lemont, of my staff at 301-415-5163 or [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov).

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosure: As stated

Docket No: 70-7015



**Lemont, Stephen**

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**From:** Lemont, Stephen  
**Sent:** Friday, March 12, 2010 11:26 AM  
**To:** 'Willie Preacher'  
**Subject:** RE: Follow-up to Consultation Letters Regarding AREVA Eagle Rock Uranium Enrichment Facility, Bonneville County, Idaho

Willie,

Thank you for responding. I apologize for the misspelling of Chairman Coby's name in the letters. I noticed that too when I was preparing my email.

I look forward to hearing back from you regarding the letters.

Thanks again.

Steve

*Stephen Lemont*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
Telephone: 301-415-5163  
Fax: 301-415-5369  
Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)

---

**From:** Willie Preacher [<mailto:wpreacher@sbtribes.com>]  
**Sent:** Friday, March 12, 2010 11:06 AM  
**To:** Lemont, Stephen  
**Subject:** RE: Follow-up to Consultation Letters Regarding AREVA Eagle Rock Uranium Enrichment Facility, Bonneville County, Idaho

Stephen the name of our Chairman is Alonzo A. Coby, you do have it right in this letter to me, but the letter that was sent to him personally is addressed to Alonzo A. Coby. We are reviewing the letters and will get back with you and as soon as we can. -Willie

---

**From:** Lemont, Stephen [<mailto:Stephen.Lemont@nrc.gov>]  
**Sent:** Friday, March 12, 2010 8:39 AM  
**To:** Willie Preacher  
**Subject:** Follow-up to Consultation Letters Regarding AREVA Eagle Rock Uranium Enrichment Facility, Bonneville County, Idaho

Dear Mr. Preacher:

I am Steve Lemont, the new U.S. Nuclear Regulatory Commission (NRC) Project Manager for the Environmental Impact Statement (EIS) that the NRC is preparing in support of its licensing action for the proposed AREVA Eagle Rock uranium enrichment facility in Bonneville County. NRC contacted Chairman Coby regarding this project in a letter dated July 29, 2009, and more recently in a letter dated February 19,

2010, regarding the proposed electrical transmission line for the AREVA Eagle Rock facility. For your reference, I have attached these two letters to this email.

The purpose of this email is to follow-up on the two letters, to request the views of the Shoshone-Bannock Tribes regarding any further actions necessary to identify historic properties that may be affected by the construction, operation, and decommissioning of the proposed AREVA Eagle Rock facility and the proposed transmission line and associated structures. Find MW004, which is discussed in the July 29 letter, has been determined to be eligible for listing in the National Register of Historic Places. Any other information you may have would also be appreciated. After assessing information you provide, we will identify any further actions that are necessary to comply with the consultation process under Section 106 of the National Historic Preservation Act.

If you have any questions regarding the project, or need additional information, please contact me at 301-415-5163 or [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov). I appreciate your assistance in this matter, and look forward to receiving your response. Thank you.

Sincerely,  
Steve Lemont

*Stephen Lemont*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
Telephone: 301-415-5163  
Fax: 301-415-5369  
Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)



October 8, 2010

Chairman Nathan Small  
The Shoshone-Bannock Tribes  
P.O. Box 306  
Fort Hall, Idaho 83203

SUBJECT: CONTINUING CONSULTATION UNDER THE NATIONAL HISTORIC PRESERVATION ACT SECTION 106 PROCESS FOR DEVELOPMENT OF MEMORANDUM OF AGREEMENT FOR THE AREVA ENRICHMENT SERVICES LLC EAGLE ROCK ENRICHMENT FACILITY PROJECT IN BONNEVILLE COUNTY, IDAHO

Dear Chairman Small:

The Nuclear Regulatory Commission (NRC) previously contacted The Shoshone-Bannock Tribes concerning the AREVA Enrichment Services LLC (AES) proposed Eagle Rock Enrichment Facility (EREF) in Bonneville County. Our most recent consultation letter, dated February 19, 2010, concerned alterations to the project's scope for the National Historic Preservation Act (NHPA) Section 106 review. Also, with a letter dated July 14, 2010, the NRC provided a copy of the project's Draft Environmental Impact Statement (EIS) for comment.

Preliminary findings regarding historical and cultural resources are discussed in the Draft EIS, Sections 3.3, 4.2.2, 4.2.16.2, and 4.3.2. One of these findings is that the proposed project is expected to cause an adverse effect on historic site MW004, the John Leopard Homestead. Site MW004 is a multi-component site consisting of a late nineteenth century to early twentieth century homestead component and a prehistoric component. The historic component of this site has been determined eligible for listing on the National Register of Historic Places (NRHP), and consists of a dug out depression, one possible privy depression, a cement lined cistern, one trash concentration, two rock piles, and a scatter of domestic trash. The prehistoric component consists of two non-diagnostic obsidian biface fragments and two flakes.

The NRC is in the process of drafting a Memorandum of Agreement (MOA) with the Idaho State Historic Preservation Office (ID SHPO) and AES, which will address the mitigation of the impacts to site MW004. In addition, because AES has indicated that final design of the proposed EREF and associated 161-kV transmission line project will not be completed until after the NRC license is issued, the draft MOA will also address the survey by AES for historical and cultural resources of any previously un-surveyed areas that may be identified following final design (e.g., transmission line construction pulling and tensioning sites). The draft MOA will also include reference to AES's unanticipated discoveries and monitoring plan.

Pursuant to Title 36 of the *U.S. Code of Federal Regulations* (36 CFR) Part 800.6(c)(3), the NRC staff invites The Shoshone-Bannock Tribes to participate in the development of the MOA for this project as a concurring party, and requests your response within 15 calendar days of receipt of this letter. As a concurring party, The Shoshone-Bannock Tribes will have the opportunity to review the draft MOA and provide comments prior to enactment of the agreement. If you accept the NRC's invitation, please provide the name and title of, and contact information for, the tribal member with whom we would coordinate for the MOA development.

If you have any questions regarding the MOA or the EREF project, or need any additional information, please contact Stephen Lemont at 301-415-5163, or by email at [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov).

Sincerely,

*/RA/*

Diana Diaz-Toro, Chief  
Environmental Review Branch A  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015

cc: S. Pengilly, ID SHPO  
J. Kay, AES

**Biwer, Bruce M.**

---

**From:** Lemont, Stephen [Stephen.Lemont@nrc.gov]  
**Sent:** Friday, October 29, 2010 6:54 AM  
**To:** wpreacher@sbtribes.com  
**Subject:** RE: Invitation to Participate as Concurring Party in Section 106 Memorandum of Agreement for AREVA Eagle Rock Project 102910  
**Attachments:** Letter to Shoshone-Bannock Tribes re Section 106 MOA Participation (ML102740387).pdf

Hi, Willie. I am just following up to find out if the council has considered the invitation in the attached letter, and if The Shoshone-Bannock Tribes would like to be a concurring party on the subject Memorandum of Agreement.

Thanks,  
Steve

*Stephen Lemont, Ph.D.*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
Telephone: 301-415-5163  
Fax: 301-415-5369  
Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)

---

**From:** Lemont, Stephen  
**Sent:** Friday, October 08, 2010 3:30 PM  
**To:** 'wpreacher@sbtribes.com'  
**Subject:** Invitation to Participate as Concurring Party in Section 106 Memorandum of Agreement for AREVA Eagle Rock Project

Hi, Willie. This is to give you advance notice of a letter the U.S. Nuclear Regulatory Commission (NRC) is sending to Chairman Small regarding the development of a National Historic Preservation Act Section 106 Memorandum of Agreement (MOA) for the AREVA Eagle Rock Enrichment Facility project.

The letter, a copy of which is attached, discusses the need for, and basic content of, the MOA. However, the main purpose of the letter is to invite The Shoshone-Bannock Tribes to participate in the development of the MOA as a concurring party. In that role, The Tribes will have the opportunity to review the draft MOA and provide comments prior to enactment of the agreement. The MOA is currently being drafted by the NRC's attorneys and when ready, will be distributed for review by the parties to the agreement. These parties already include the Idaho State Historic Preservation Office and AREVA, in addition to the NRC.

Please contact me if you have any questions regarding the letter or if you need additional information. We hope the Tribes will accept the NRC's invitation and look forward to working with you on the development of the MOA. Thank you.

Sincerely,  
Steve

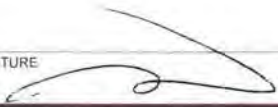
*Stephen Lemont, Ph.D.*

Senior Environmental Project Manager

U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
Telephone: 301-415-5163  
Fax: 301-415-5369  
Email: [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov)

The attachment referred to in this document is included in Section B.2 of Appendix B, directly preceding this document.



NRC FORM 699 (9-2003)		U.S. NUCLEAR REGULATORY COMMISSION		DATE 11/30/2010
<b>CONVERSATION RECORD</b>				TIME
NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU Willie Preacher		TELEPHONE NO. 208-478-3707		TYPE OF CONVERSATION <input type="checkbox"/> VISIT <input type="checkbox"/> CONFERENCE <input checked="" type="checkbox"/> TELEPHONE <input type="checkbox"/> INCOMING <input checked="" type="checkbox"/> OUTGOING
ORGANIZATION The Shoshone-Bannock Tribes, Fort Hall Indian Reservation, Idaho				
SUBJECT Follow-up on NRC Invitation to The Shoshone-Bannock Tribes to be a Concurring Party on the Section 106 Memorandum of Agreement for the AREVA Eagle Rock Project				
SUMMARY (Continue on Page 2) I told Mr. Preacher that I was calling to follow up on the October 8, 2010, letter that the NRC sent to Chairman Small of The Shoshone-Bannock Tribes, inviting the Tribes to be a concurring party on the National Historic Preservation Act Section 106 Memorandum of Agreement, or MOA, for the AREVA Eagle Rock project. Mr. Preacher said that he gave the letter to Carolyn Smith, the Tribes' cultural resources person; and that he would check with her and get back to me.				
Continue on Page 2				
ACTION REQUIRED None.				
NAME OF PERSON DOCUMENTING CONVERSATION Stephen Lemont		SIGNATURE 		DATE 11/30/2010
ACTION TAKEN				
TITLE OF PERSON TAKING ACTION		SIGNATURE OF PERSON TAKING ACTION		DATE



**From:** Lemont, Stephen [mailto:Stephen.Lemont@nrc.gov]  
**Sent:** Tuesday, December 21, 2010 10:19 AM  
**To:** 'wpreacher@sbtribes.com'  
**Subject:** Follow-up on NRC Invitation to Participate as Concurring Party in Section 106 Memorandum of Agreement for AREVA Eagle Rock Project

Willie,

The purpose of this email is to check back with you once more to find out if the Shoshone-Bannock Tribes would like to be a concurring party on the subject Memorandum of Agreement (MOA) for the AREVA Eagle Rock Enrichment Facility project. The U.S. Nuclear Regulatory Commission's (NRC's) invitation to be a concurring party was provided in the attached letter that was sent to Chairman Small on October 8, 2010. When I called you about this invitation on November 30, you mentioned that you had given the letter to Carolyn Smith, the Tribes' Cultural Resources Coordinator, and that you would check with her and get back to me.

The purpose and basic content of the MOA is discussed in the attached letter. As a concurring party, the Tribes will have the opportunity to review the draft MOA and provide comments prior to enactment of the agreement. The draft MOA is currently being completed by the NRC's attorneys and when ready, will be distributed for review by the parties to the agreement. Presently, these parties include the Idaho State Historic Preservation Office and AREVA, in addition to the NRC.

Please contact me if you have any questions regarding the attached letter or if you need additional information. We hope the Shoshone-Bannock Tribes will accept the NRC's invitation and look forward to working with you on the development of the MOA.


I look forward to receiving your reply soon. Thank you.

Sincerely,  
Steve

*Stephen Lemont*

Senior Environmental Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Federal and State Materials and  
Environmental Management Programs  
Mail Stop: T-8F5  
Washington, DC 20555-0001  
Telephone: 301-415-5163  
Fax: 301-415-5369  
Email: Stephen.Lemont@nrc.gov

The attachment referred to in this document precedes the October 29, 2010, email to Willie Preacher included in Section B.2 of Appendix B.

NRC FORM 699 (9-2003)		U.S. NUCLEAR REGULATORY COMMISSION		DATE 12/22/2010
<b>CONVERSATION RECORD</b>				TIME
NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU <b>Carolyn Smith, Cultural Resources Coordinator</b>		TELEPHONE NO. <b>208-221-0326</b>		TYPE OF CONVERSATION <input type="checkbox"/> VISIT <input type="checkbox"/> CONFERENCE <input checked="" type="checkbox"/> TELEPHONE <input type="checkbox"/> INCOMING <input checked="" type="checkbox"/> OUTGOING
ORGANIZATION <b>The Shoshone-Bannock Tribes, Fort Hall, Idaho</b>				
SUBJECT <b>NRC Invitation to the Tribes to be a Concurring Party on the Section 106 MOA for AREVA Eagle Rock Project</b>				
SUMMARY (Continue on Page 2) <p>I confirmed the phone message I received today from Ms. Smith that the Tribes do want to be a party to the MOA. I explained that the Tribes would be a concurring party, meaning that they would be able to comment on the draft MOA. I said that the NRC is in the process of completing the draft MOA, and that it will be sent to the Idaho SHPO, AREVA, and the Tribes for review; and that I intend to hold a conference call to discuss all of our comments.</p> <p>Ms. Smith said to mail the draft MOA to her and to Willie Preacher. I said that I will probably send an advance copy of the draft MOA and transmittal letter to them by email, and asked for Ms. Smith's email address. It is csmith@sbtribes.com.</p>				
Continue on Page 2				
ACTION REQUIRED None				
NAME OF PERSON DOCUMENTING CONVERSATION <b>Stephen Lemont</b>		SIGNATURE 		DATE 12/22/2010
ACTION TAKEN				
TITLE OF PERSON TAKING ACTION		SIGNATURE OF PERSON TAKING ACTION		DATE

### B.3 Other Consultation

October 2, 2009

Mr. Keith Dunbar  
National Park Service  
Chief of Park Planning  
and Environmental Compliance  
909 First Avenue,  
Seattle, WA 98104

Dear Mr. Dunbar:

On December 30, 2008, AREVA Enrichment Services (AES) submitted an Environmental Report (ER) to the U.S. Nuclear Regulatory Commission (NRC). The ER is one part of an application for a license to authorize construction, operation, and decommissioning of a proposed uranium enrichment facility. The NRC staff is in the initial stages of developing an Environmental Impact Statement (EIS) for the proposed facility to be located 20 miles west of Idaho Falls, Idaho in Bonneville County. The facility, if licensed, would use a gas centrifuge based technology to enrich the isotope uranium-235 in uranium hexafluoride up to 5 percent by weight. The EIS will document the impacts associated with the construction, operation, and decommissioning of the proposed facility.

The proposed location for the facility is due north of the Hell's Half Acre National Natural Landmark. The proposed AES parcel is approximately 1,700 hectares (4,200 acres). AES states that the facility footprint encompasses 381 hectares (941 acres) of the site for which construction, operation, and decommissioning activities will occur. The proposed site is situated on the north side of U.S. Highway 20. The coordinates for the center of the action area are 43 degrees, 35 minutes, 7.37 seconds North and longitude 112 degrees, 25 minutes, 28.71 seconds West. The project area is currently mixed used for open range land and agriculture.

The Hell's Half Acre National Natural Landmark is managed by the Bureau of Land Management (BLM) as a Wildlife Study Area. The BLM has been contacted by both the NRC and AES concerning the project. The NRC wants to provide the National Park Service with an opportunity to comment on the abovementioned project. The NRC is requesting the views of your office on any impacts that may be caused by the construction, operation and decommissioning of the proposed facility. After assessing information you provide, we will determine if any additional actions or mitigation actions are necessary.

K. Dunbar

2

We would like a response from your office by *Oct 31, 2009*, if possible. If you have any questions or comments with regard to this, or need any additional information, please contact Mathews George of my staff on 301-415-7065.

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015





United States Department of the Interior

NATIONAL PARK SERVICE  
Pacific West Region  
909 First Avenue, Fifth Floor  
Seattle, Washington 98104-1060



IS BRUSH REFER TO:  
EC-Hell's Half-Acre

December 28, 2009

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

RE: Application for license for proposed uranium enrichment facility north of Hell's Half-Acre Lava Field National Natural Landmark

Dear Ms. Kock:

Thank you for your letter dated October 2, 2009, concerning AREVA Enrichment Services' proposed uranium enrichment facility near Hell's Half-Acre Lava Field National Natural Landmark (NNL), which the National Park Service (NPS) oversees as part of the NNL program. As you know, Hell's Half-Acre Lava Field NNL is located on land owned by the Bureau of Land Management (BLM) and is a Wilderness Study Area (WSA). (Please note that it is not a Wildlife Study Area as the October letter stated.) It also appears that the State of Idaho may own sections of land within the NNL.

Hell's Half-Acre Lava Field NNL was designated in 1976 primarily for its geologic significance (e.g., single event, geologic process with a fully exposed pahoehoe lava flow). However, the NNL also provides an outstanding example of pioneer vegetation establishing itself on a lava flow. This is evidenced by numerous mosses, lichens, and ferns that have established themselves in, on, and among fractures, depressions, and small lava caves throughout the NNL/WSA. In addition, a significant number of visitors hike on trails located adjacent to the NNL/WSA, and many recreate on the lava flow within the NNL/WSA.

The Idaho National Laboratory (INL), administered by the U.S. Department of Energy, is located directly adjacent to the proposed project. The INL is an ecological field laboratory where scientists may set up long-term experiments which answer questions about human impact on the natural environment. It is a leading center for nuclear safety research, defense programs, nuclear waste technology and advanced energy concepts, and has an extensive environmental monitoring program both on- and off-site. Off-site monitoring data and information can be found at: <http://www.stoller-eser.com/index.htm>. DOE also funds a similar state-run monitoring program: [http://www.deq.idaho.gov/inl\\_oversight/index.cfm](http://www.deq.idaho.gov/inl_oversight/index.cfm).

The greatest concern that has been identified on the INL is on-site groundwater contamination. Airborne radioactive contamination has not been detected off-site. While the proposed AREVA facility is not a





DOE project and is not officially connected with the INL, the INL has extensive information that should be relevant for developing impact analyses in the Environmental Impact Statement (EIS), because of the proposed project's close proximity to the INL. NPS recommends the following areas of analysis:

- Potential groundwater and airborne radioactive contamination that might impact the NNL/WSA.
- Lighting impacts to the dark night sky at the NNL, as well as at Craters of the Moon National Monument and Preserve (CRMO) located 45 miles west from the proposed facility.
- Cumulative impacts on the dark night sky at the NNL and CRMO, especially since there is already a significant light dome associated with the INL.
- Construction impacts, especially from excessive dust, to the unique botanical resources of the NNL (e.g., dust could settle and accumulate on these plants, including outlier juniper trees, depriving them of needed sunlight).

We would appreciate receiving a copy of the Draft EIS (please see attached instructions). Please also notify the following persons when the Draft EIS is available for review:

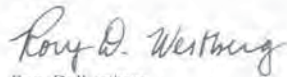
Mr. Steve Gibbons,  
Coordinator  
National Natural Landmarks  
Program  
National Park Service  
810 State Route 20  
Sedro Woolley, WA 98284  
Telephone: (360) 854-7203  
FAX: (360) 856-1934  
Email:  
[steve\\_gibbons@nps.gov](mailto:steve_gibbons@nps.gov)

Mr. Doug Neighbor,  
Superintendent  
Craters of the Moon National  
Monument & Preserve  
PO Box 29  
Arco, ID 83213  
Phone: (208) 527-1310  
FAX: (208) 527-3073  
E-mail:  
[doug\\_neighbor@nps.gov](mailto:doug_neighbor@nps.gov)

Ms. Kelly Powell  
Realty Specialist  
168 S. Jackson St., 2<sup>nd</sup> Floor  
Seattle, WA 98104-2853  
Phone: (206) 220-4106  
FAX: (206) 447-4246  
Email:  
[kelly\\_powell@nps.gov](mailto:kelly_powell@nps.gov)

Thank you for the opportunity to provide these comments.

Sincerely,



Rory D. Westberg  
Acting Regional Director  
Phone: (206) 220-4106  
FAX: (206) 220-4159  
[Rory\\_Westberg@nps.gov](mailto:Rory_Westberg@nps.gov)

Attachment

**U.S. Department of the Interior**  
**ENVIRONMENTAL REVIEW DISTRIBUTION REQUIREMENTS**  
September 2007

To expedite requests to the Department of the Interior (Department) for the review of environmental documents under the National Environmental Policy Act (NEPA); Section 4(f) of the Department of Transportation Act; project planning, design, and application documents under various Federal authorities; and requests for coordination and consultation early in project planning; please note the following:

Appendix III to the Council on Environmental Quality's (CEQ) regulations (49 FR 49778; December 21, 1984) lists the Director, Office of Environmental Project Review (now the Office of Environmental Policy and Compliance (OEPC)), as the individual responsible for receiving and commenting on other agencies' environmental documents. If properly followed, this process results in your agency receiving one set of comments consolidating the views of all commenting bureaus and offices within the Department. Therefore, please send all officially approved documents requesting environmental and other project review to the following address:

Director, Office of Environmental Policy and Compliance  
U.S. Department of the Interior  
Main Interior Building (MS 2462)  
1849 C Street, NW  
Washington, DC 20240

**OEPC is the central coordination office for the Department on all environmental reviews proposed by other federal agencies.** It is unnecessary to send copies of environmental and other project review requests to any other bureau or office within Interior, unless that bureau or office has been a part of your coordination or cooperating agency processes. However, a sufficient number of copies must still be sent to OEPC to allow distribution of the document to those Interior bureaus identified by OEPC to participate in the review process. The requested numbers of copies allow for simultaneous review throughout each bureau thus producing the Department's consolidated review in the shortest possible time. The following numbers of copies should be provided:

Twelve (12) copies of a draft and six (6) copies of a final document for projects in the Eastern United States including MN, IA, MO, AR, and LA. The same numbers of copies should be provided for projects in HI and the U.S. Territories (American Samoa, Commonwealth of Northern Mariana Islands, Guam, Puerto Rico, and U.S. Virgin Islands).

Eighteen (18) copies of a draft and nine (9) copies of a final document for projects in the Western United States westward of the western boundaries of MN, IA, MO, AR, and LA.

Eighteen (18) copies of a draft and nine (9) copies of a final document for review requests which are national in scope (e.g. agency regulations, scientific reports, special reports, program plans, and other interagency documents).

Sixteen (16) copies of a draft and eight (8) copies of a final document for projects in AK.

When a review document does not have draft and final versions, the larger number of copies is requested.

**In an effort to help reduce the Federal government's cost for the reproduction of paper documents and to help reduce waste, we ask that you provide the URL for projects available on the Internet. Copies of environmental and project review documents that are available in CD-ROM or any other widely used electronic method may also be furnished in lieu of paper copies. When this is the case, we would still appreciate receiving one paper copy for our official file. Please provide an Internet address, CDs, one paper copy, or paper copies, as appropriate, directly to this office.**

Appendix II to the CEQ regulations (49 FR 49754; December 21, 1984) lists Interior bureaus and offices having jurisdiction by law or special expertise on environmental quality issues. Appendix II should be used to determine appropriate Interior contacts for coordination during early planning, NEPA scoping, and other preliminary activities. Since this document may be out of date, it is recommended that you consult the following Internet addresses for the latest bureau contacts: <http://ceq.eh.doe.gov/nepa/nepanet.htm> or <http://www.doi.gov/oepe/nepacontacts.html>.

All early coordination and scoping requests, environmental assessments or reports not accompanied by project planning or design documents, findings of no significant impact, preliminary or working draft or final environmental impact statements, and similar material of a regional nature should be sent directly to Interior bureaus at the field level. It is not necessary to send copies of early coordination documents to the OEPC in Washington, DC. Please note that our Regional Environmental Officers (REO) serve as representatives of OEPC and should be contacted if there are questions about these procedures at the field level. A REO list is attached and is also available on our web site at: <http://www.doi.gov/oepe/reo.html>.

Representatives of your organization should establish direct working relationships with Departmental and bureau field level offices, which welcome such contact. This type of relationship is important not only during early project coordination, but also to expedite the early resolution of environmental issues that would otherwise surface during the formal review of a project document. In many cases, Interior's comments on an environmental review will designate an office at the field level for follow-up activities.

**We ask that you make a wide distribution of this information throughout your organization.** Such a distribution will greatly assist our agencies in better meeting our obligations under existing laws and in planning projects that will be mutually beneficial.

Attachment (REO List)

U. S. DEPARTMENT OF THE INTERIOR  
OFFICE OF ENVIRONMENTAL POLICY and COMPLIANCE  
REGIONAL ENVIRONMENTAL OFFICES

DIRECTOR  
WILLIE R. TAYLOR

1849 C STREET, NW., MS 2342  
WASHINGTON, DC 20240  
PHONE: 202-208-3891  
FAX: 202-208-6970  
MAY 7, 2007

DEPUTY DIRECTOR  
MARY JOSIE BLANCHARD

BOSTON - CT, MA, ME, NH, NJ, NY, RI, VT

Andrew L. Raddant  
Diane Lasinsky

Phone: 617-223-8565  
Fax: 617-223-8569  
408 Atlantic Avenue, Room 141  
Boston, MA 02210-3334

PHILADELPHIA - DC, DE, IL, IN, MD, MI, MN, OH, PA, VA, WI, WV

Michael T. Chesik  
Robert M. Burr  
Valencia Darby

Phone: 215-597-5378  
FAX: 215-597-9845 (Primary)  
215-597-5012 (Alternate)  
Custom House, Room 244  
200 Chestnut Street  
Philadelphia, PA 19106

ATLANTA - AL, FL, GA, KY, MS, NC, PR, TN, SC, VA

Gregory L. Hogue  
Joyce A. Stanley

Phone: 404-331-4524  
FAX: 404-331-1736  
Russell Federal Bldg., Suite 1144  
75 Spring Street, S.W.  
Atlanta, GA 30303

ALBUQUERQUE - AR, LA, NM, OK, TX

Stephen R. Spencer  
Shirley Martinez

Phone: 505-563-3572  
FAX: 505-563-3066  
P.O. Box 26567, (MC-9)  
Albuquerque, NM 87125-5567  
1001 Indian School NW, Suite 248  
Albuquerque, NM 87104

DENVER - CO, IA, KS, MO, MT, NE, ND, SD, UT, WY

Robert P. Stewart  
Diane Niedzwiecki

Phone: 303-445-2500  
FAX: 303-445-6320  
P.O. Box 25007 (D-108)  
Denver Federal Center  
Denver, CO 80225-0007  
(Bldg. 56, Rm. 1003, 6<sup>th</sup> & Waples)

OAKLAND - AS, AZ, CA, CM, GU, HI, HV

Patricia S. Port  
Harry (Chip) E. Demarest  
John A. Perez

Phone: 510-817-1477  
FAX: 510-419-0177  
Jackson Center One  
1111 Jackson Street, Suite 510  
Oakland, CA 94607

FORTLAND - ID, OR, WA

Preston A. Sleeper  
Trisha Allison D'Brien  
Mandy Stanford

Phone: 503-231-6157  
Fax: 503-231-2361  
500 NE Multnomah Street, Suite 356  
Portland, OR 97232-2036

ANCHORAGE - AK

Pamela A. Bergmann  
Douglas L. Mutter

Phone: 907-271-5011  
Fax: 907-271-4102  
1629 C Street, Room 118  
Anchorage, AK 99501-5129



June 24, 2009

Mr. Paul Kjellander  
Office of Energy Resources  
322 East Front Street  
P.O. Box 83720  
Boise, ID 83720

SUBJECT: REQUEST FOR INFORMATION REGARDING ENDANGERED SPECIES AND  
CRITICAL HABITATS FOR THE PROPOSED AREVA EAGLE ROCK  
ENRICHMENT FACILITY LOCATED IN BONNEVILLE COUNTY, IDAHO

Dear Mr. Kjellander:

On December 30, 2008, AREVA Enrichment Services (AES) submitted an environmental report (ER) to the U.S. Nuclear Regulatory Commission (NRC). The ER is one part of an application for a license to authorize construction, operation, and decommissioning of a proposed uranium enrichment facility. The NRC staff is in the initial stages of developing an Environmental Impact Statement (EIS) for the proposed facility to be located near Idaho Falls, Idaho in Bonneville County. The facility, if licensed, would use a gas centrifuge based technology to enrich the isotope uranium-235 in uranium hexafluoride up to 5 percent by weight. The EIS will document the impacts associated with the construction, operation, and decommissioning of the proposed facility.

NRC requests information on the following items within the action area for the proposed facility, if available:

- Endangered or threatened species, or other species of concern to the state of Idaho, that are known to be or likely to be at the proposed AREVA site, and nearest known locations based on the element occurrence database. Enclosed is a preliminary list of species compiled from Idaho Fish and Game (IDFG) county lists (plants) and the IDFG Snake River Basalts Ecological Section list (animals). Habitat on the site consists of sagebrush steppe, non-native grassland (primarily crested wheatgrass and cheatgrass), and irrigated crops.
- Nearest known lek sites (based on the element occurrence database), nesting habitat, brood-rearing habitat, and winter habitat for greater sage grouse, migratory status of the local population, the number of leks nears the site, and trends.
- Information on Sagebrush Reserves (location, size, species, management) or other sensitive or rare habitats in the project vicinity.
- Information on mule deer, pronghorn, and elk herds, including seasonal habitat (such as crucial winter habitat areas), local migration routes, and concerns such as population trends.
- Important migration routes for migratory birds.
- Maps or GIS shapefiles regarding species or habitats.
- Concerns of IDFG regarding potential impacts of the proposed project.



The proposed AES parcel is approximately 1,700 hectares (4,200 acres). AES states that the facility footprint encompasses 381 hectares (941 acres) of the site for which construction, operation, and decommissioning activities will occur. The proposed site is situated within Bonneville County, Idaho, on the north side of U.S. Highway 20, about 113 km (70 miles) west of the Idaho/Wyoming State line. The coordinates for the center of the action area are 43 degrees, 35 minutes, 7.37 seconds North and longitude 112 degrees, 25 minutes, 28.71 seconds West.

We have enclosed additional background information relating to ecological resources on the site, including a map showing the action area, as it appears in the AES ER.

We intend to use the EIS process to comply with Section 7 of the Endangered Species Act of 1973, as amended. After assessing information you provide, we will determine what additional actions are necessary to comply with the Section 7 consultation process. If you have any questions or comments, or need any additional information, please contact Gloria Kulesa of my staff at 301-415-5308.

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015

Enclosures:

1. Special Status Plants and Species
2. Ecology Field Survey Report
3. Fall 2008 Survey
4. Sage Grouse Survey Report

### Idaho Special Status Plants and Species of Greatest Conservation Need

Earth lichen (*Catapyrenium congestum*)  
Gray willow (*Salix glauca*)  
Green spleenwort (*Asplenium trichomanes-ramosum*)  
Iodine bush (*Allenrolfea occidentalis*)  
Meadow milkvetch (*Astragalus diversifolius*)  
Payson's bladderpod (*Lesquerella paysonii*)  
Payson's milkvetch (*Astragalus paysonii*)  
Red glasswort (*Salicornia rubra*)  
Slickspot peppergrass (*Lepidium papilliferum*)  
Ute ladies'-tresses (*Spiranthes diluvialis*)  
Western Sedge (*Carex occidentalis*)

Utah valvata snail (*Valvata utahensis*)

Northern leopard frog (*Rana pipiens*)

Ring-necked snake (*Diadophis punctatus*)

Black-crowned night-heron (*Nycticorax nycticorax*)  
Blue grosbeak (*Passerina caerulea*)  
Burrowing owl (*Athene cunicularia*)  
California gull (*Larus californicus*)  
Ferruginous hawk (*Buteo regalis*)  
Franklin's gull (*Larus pipixcan*)  
Juniper titmouse (*Baeolophus ridgwayi*)  
Lesser goldfinch (*Carduelis psaltria*)  
Merlin (*Falco columbarius*)  
Northern pintail (*Anas acuta*)  
Peregrine falcon (*Falco peregrinus*)  
Pinyon jay (*Gymnorhinus cyanocephalus*)  
Sharp-tailed grouse (*Tympanuchus phasianellus*)  
Swainson's hawk (*Buteo swainsoni*)  
Virginia's warbler (*Vermivora virginiae*)  
White-faced ibis (*Plegadis chihi*)  
Yellow-billed cuckoo (*Coccyzus americanus*)

Canada lynx (*Lynx canadensis*)  
Gray wolf (*Canis lupus*)  
Great Basin ground squirrel (*Spermophilus mollis*)  
Grizzly bear (*Ursus arctos*)  
Idaho pocket gopher (*Thomomys idahoensis*)  
Little pocket mouse (*Perognathus longimembris*)  
Merriam's shrew (*Sorex merriami*)  
Pygmy rabbit (*Brachylagus idahoensis*)  
Spotted bat (*Euderma maculatum*)  
Townsend's big-eared bat (*Corynorhinus/Plecotus townsendii*)  
Townsend's pocket gopher (*Thomomys townsendii*)  
Wyoming ground squirrel (*Spermophilus elegans*)

Enclosure 1

February 18, 2010

Paul Kjellander  
Idaho Office of Energy Resources  
322 East Front Street, Suite 560  
Post Office Box 83720  
Boise, Idaho 83720-0199

SUBJECT: COORDINATION REGARDING ELECTRICAL TRANSMISSION LINE FOR  
PROPOSED AREVA EAGLE ROCK URANIUM ENRICHMENT FACILITY,  
BONNEVILLE COUNTY, IDAHO

Dear Mr. Kjellander:

As discussed in our earlier letter to you dated June 24, 2009, AREVA Enrichment Services LLC (AES) has submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for a license to construct, operate, and decommission a gas centrifuge uranium enrichment facility. The proposed facility, the Eagle Rock Enrichment Facility (EREF), would be located in Bonneville County, Idaho, near Idaho Falls. NRC is preparing an Environmental Impact Statement (EIS) in support of its licensing action for this facility. The purpose of the present letter is to report an addition to the scope of the EREF project, a 161-kilovolt (KV) transmission line to power the facility.

On January 29, 2010, AES submitted information to NRC for the construction and operation of a proposed transmission line, an electrical substation, and substation upgrades. The locations of the transmission line and substations are shown in the January 29, 2010 submittal, a copy of which is enclosed. NRC's EIS for the proposed EREF will include a discussion of the impacts associated with the construction and operation of the transmission line project. NRC requests your office's feedback on potential impacts to electrical distribution in the area of the EREF or on any other matter related to the proposed transmission line or the EREF project itself. Also, we understand that your office coordinates with other State of Idaho agencies on energy resource matters. Therefore, please feel free to share this letter with other State agencies. NRC is already coordinating separately with the Idaho Department of Fish and Game and Idaho Department of Environmental Quality.

The new transmission line and associated structures would be located entirely on private land within Bonneville County. Rocky Mountain Power (RMP), a division of PacifiCorp, will be the builder, owner, and operator. The transmission line would originate from the existing RMP Bonneville Substation and extend in a general westward direction to the new point of service, the Twin Buttes Substation on the proposed EREF site. Beginning at the Bonneville Substation, the proposed transmission line route is west along the county road (West 65 North Street) to the existing RMP Kettle Substation, a distance of approximately 14.5 kilometers (9 miles), continuing west to the eastern portion of the EREF site, a distance of approximately 1.2 kilometer (0.75 mile), then north within the EREF site to its northern end, then west and south to the new RMP Twin Buttes Substation, for a distance of approximately 6.4 kilometers (4 miles). The area being affected by the transmission line is approximately 84 hectares (208 acres).

P. Kjellander

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If you have any questions regarding this request, or need additional information, please contact Stephen Lemont of my staff at 301-415-5163 or [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov).

Sincerely,

/RA/

Andrea Kock, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosure:  
January 29, 2010 Ltr.

Docket No: 70-7015



November 23, 2010

Mr. Matt McMillen, Director  
Environmental Compliance Division  
Loan Programs Office, DOE  
U.S. Department of Energy LP 10  
1000 Independence Avenue, SW  
Washington, DC 20585

SUBJECT: OCTOBER 21, 2010, TELEPHONE CONVERSATION REGARDING  
COMPLIANCE WITH FARMLAND PROTECTION POLICY ACT FOR THE  
PROPOSED AREVA ENRICHMENT SERVICES LLC EAGLE ROCK  
ENRICHMENT FACILITY IN BONNEVILLE COUNTY, IDAHO

Dear Mr. McMillen:

The U.S. Nuclear Regulatory Commission (NRC) appreciates the participation of U.S. Department of Energy (DOE) Loan Programs Office (LPO) staff in telephone conversations with NRC staff regarding compliance with the Farmland Protection Policy Act (FPPA) for the proposed AREVA Enrichment Services LLC (AES) Eagle Rock Enrichment Facility (EREF). For this project, the NRC is currently reviewing the license application from AES, and the DOE LPO has offered AES a conditional loan guarantee.

During an October 21, 2010, telephone conversation between Mr. Joseph Montgomery, DOE LPO consultant, and Mr. Stephen Lemont of the NRC, Mr. Montgomery related the DOE LPO's decision to go through the FPPA process for the proposed EREF project, including the completion of the necessary U.S. Department of Agriculture forms over the next few weeks. This is appropriate because the DOE's loan guarantee action is subject to the requirements of the FPPA, but the NRC's licensing action is not. It was also discussed that in the Final Environmental Impact Statement the NRC is currently preparing in support of its licensing action, there will be language to the effect that (1) the DOE conditional loan guarantee action is subject to the requirements of the FPPA for purposes of the EREF project, and (2) the DOE has completed/will complete the required farmland conversion impact rating and any associated actions or determinations in compliance with the FPPA, as necessary.



M. McMillen

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Please contact Mr. Stephen Lemont of my office at 301-415-5163, or by email at [Stephen.Lemont@nrc.gov](mailto:Stephen.Lemont@nrc.gov), if you have any questions. Thank you.

Sincerely,

/RA/

David L. Skeen, Acting Deputy Director  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 70-7015

cc: Joseph Montgomery, DOE

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**APPENDIX C  
AIR QUALITY ANALYSIS**



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## APPENDIX C AIR QUALITY ANALYSIS

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Air quality modeling was performed to estimate concentration increments at the property boundary as a result of air emissions during the construction phase at the proposed Eagle Rock Enrichment Facility (EREF). Air quality modeling was performed for criteria air pollutants including sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), and particulate matter (PM) (particulate matter equal to or smaller than 10 micrometers in aerodynamic diameter [PM<sub>10</sub>] and particulate matter equal to or smaller than 2.5 micrometers in aerodynamic diameter [PM<sub>2.5</sub>]). Air quality modeling for ozone (O<sub>3</sub>) and lead was not conducted.<sup>1</sup> The following sections describe the air dispersion model, determination of surface characteristics, meteorological data processing, terrain data processing, and the modeling assumptions behind the results and the discussions presented in Section 4.2.4.

### C.1 Selection of Air Dispersion Model

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For this modeling analysis, the latest version of the AMS/EPA Regulatory MODel (AERMOD) modeling system (Version 07026) (EPA, 2009) was used. AERMOD is the U.S. Environmental Protection Agency's (EPA's) preferred or recommended model for a wide range of regulatory applications (EPA, 2009). AERMOD is a refined, steady-state plume model that incorporates air dispersion based on state-of-the-art planetary boundary layer turbulence structure and scaling concepts, building wake effects, and plume downwash for point sources. It includes treatment of both surface and elevated sources (including multiple-point, area, and volume sources) and both simple and complex terrain, and can be applied to rural and urban areas. The model uses hourly sequential preprocessed meteorological data to estimate not only airborne concentrations but also dry and wet deposition fluxes for both particulate and gaseous emissions of nonreactive pollutants for averaging times ranging from one hour to periods as long as one to multiple years.

AERMOD contains three major separate components:

- AERMET – meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts
- AERMAP – terrain data preprocessor that incorporates complex terrain using digital elevation data

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<sup>1</sup> At a regional level, ozone is formed by highly complex and nonlinear reactions involving nitrogen oxide (NO<sub>x</sub>) and volatile organic compound (VOC) precursors. Air quality modeling for ozone requires extensive meteorological and emission data processing and substantial computational resources. Neither construction- nor operation-related activities would produce impacts high enough to have significant influence on regional ozone levels. No ozone modeling is therefore warranted. Air quality modeling for lead was not conducted because there are no significant sources of lead emissions related to the projected activities at the proposed EREF. Since the phase-out of leaded gasoline in the 1970s, ambient air impacts from lead emissions during construction and operation of the proposed EREF would be insignificant.

- 1 • AERMOD – air dispersion model to estimate airborne concentrations and dry/wet deposition  
2 fluxes  
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4 In addition, AERSURFACE, a surface characteristics preprocessor part of AERMOD that  
5 estimates surface characteristics including surface roughness length, albedo, and Bowen ratio  
6 for input to the AERMET was also run to complement and refine the AERMOD results. Two  
7 other related modeling programs, BPIPPRIME (a tool that calculates building parameters to  
8 account for building downwash effects of point source(s) for input to the AERMOD) and  
9 AERSCREEN (a screening model for AERMOD that produces estimates of regulatory design  
10 concentrations without the need for meteorological data and is designed to produce more  
11 conservative results than AERMOD) are also part of the AERMOD dispersion modeling system.  
12 However, neither would have produced relevant or more accurate results applicable to the  
13 proposed EREF site and were therefore not used.  
14

## 15 **C.2 Determination of Surface Characteristics** 16

17 In order to compute the fluxes and stability of the atmosphere, AERMET needs three surface  
18 characteristic parameters: surface roughness length, albedo, and the Bowen ratio. The surface  
19 roughness length is a measure of irregularities at the surface, including vegetation, topography,  
20 and structures, which influence the near-surface wind stress. Surface roughness length plays  
21 the most crucial role in determining the magnitude of mechanical turbulence and the stability of  
22 the boundary layer. The typical values range from 0.001 meter (0.003 feet) over calm water  
23 surfaces and 1 meter (3.3 feet) or more over a forest or urban area. Albedo is the ratio of the  
24 amount of radiation reflected from the surface to the amount of radiation incident on the surface.  
25 Typical values range from 0.1 for thick deciduous forests to 0.9 for fresh snow. The Bowen  
26 ratio, an indicator of surface moisture, is the ratio of sensible heat flux to the latent heat flux.  
27 The Bowen ratio is used to determine the planetary boundary layer parameters for convective  
28 conditions. The typical values range from 0.1 over water to 10 over desert at midday.  
29

30 Surface characteristics should represent the meteorological data at the application site. If such  
31 data is not available for the application site, then data from a nearby representative  
32 measurement site must instead be used. The proposed EREF has no onsite meteorological  
33 station. The nearest meteorological station is near the Materials and Fuels Complex (MFC)  
34 within the Idaho National Laboratory (INL) site, which is located about 11 miles (18 kilometers)  
35 west of the proposed EREF. The MFC and proposed EREF sites are located in the middle of  
36 the Eastern Snake River Plain (ESRP), which is a wide flat bow-shaped depression extending  
37 about 400 miles (640 kilometers). The elevation and terrain features and land uses surrounding  
38 the MFC area are comparable to those of the proposed EREF site. Accordingly, the MFC site is  
39 considered adequately representative of the proposed EREF site and was used as a substitute  
40 for onsite meteorological data for this assessment.  
41

42 The AERSURFACE tool was developed to aid users in obtaining realistic and reproducible  
43 surface characteristic values, which is, in turn, input to AERMET. AERSURFACE requires land  
44 cover data from the U.S. Geological Survey (USGS) National Land Cover Data 1992 archives  
45 (NLCD92). These surface characteristics for the MFC site, downloaded from the USGS Web  
46 site (<http://seamless.usgs.gov/>), were used as representative of the land cover types around the  
47 proposed EREF site.  
48



1 Seasonal surface characteristics were determined for each of twelve 30-degree sectors for this  
2 analysis. A default upwind distance of 1 kilometer (0.6 mile) from the measurement sites on the  
3 proposed EREF property was used to determine the surface roughness values, per  
4 recommendation in EPA's AERMOD Implementation Guide (EPA, 2009). A default domain  
5 defined by a 10-kilometer by 10-kilometer (6.2-mile by 6.2-mile) area centered on the  
6 measurement sites at the proposed EREF property was used for determination of albedo and  
7 Bowen ratio. To determine the Bowen ratio, the surface moisture condition around the  
8 proposed site was needed to characterize the proposed EREF site relative to climatological  
9 normals. Surface moisture conditions for the Bowen ratio were determined by year, based on  
10 the 30-year (1971–2000) annual precipitation record at the Pocatello Municipal Airport, which  
11 has more comprehensive precipitation data than other nearby meteorological sites, including  
12 National Weather Service's (NWS) MFC station (NCDC, 2009a,b). For this analysis, annual  
13 precipitation data from the MFC site for the years 2004–2008 were compared to the  
14 representative dry, normal, and wet conditions established using the 30-year Pocatello Airport  
15 precipitation data. If annual precipitation for each of these years falls within lower-30<sup>th</sup>  
16 percentile or the upper-30<sup>th</sup> percentile of the 30-year record, dry and wet conditions,  
17 respectively, are assigned. Otherwise, average moisture conditions are assigned. Year 2005  
18 was characterized as a wet condition; 2008 was characterized as a dry condition; 2004, 2006,  
19 and 2007 were characterized as average with respect to annual rainfall. Additional inputs to  
20 affect surface characteristic values include whether the site is an airport, an arid region, or  
21 experiences continuous snow cover most of the winter. For this analysis, the MFC site was  
22 identified as a non-airport site, so the AERSURFACE model would select high surface  
23 roughness values representative of commercial and industrial land cover. For selection of an  
24 arid region such as the location of the proposed EREF, the AERSURFACE model uses the  
25 seasonal characteristics for shrubland and bare rock/sand/clay categories that are more  
26 representative of a desert area. Appropriate seasonal values for the three parameters are  
27 applied, depending on whether the site experiences continuous snow cover most of the winter.  
28

### 29 **C.3 Meteorological Data Processing**

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31 The meteorological data preprocessor AERMET requires three types of data: data collected  
32 from an onsite measurement program such as from an instrumented tower, if available; NWS  
33 hourly surface observations; and NWS twice-daily upper air soundings. As discussed above,  
34 the MFC site was assumed to represent the proposed EREF site for this assessment.  
35

36 Meteorological data at the MFC site, including wind speed and direction, ambient temperature,  
37 and standard deviation of horizontal wind direction, were collected at two heights (10 and  
38 76 meters [33 and 249 feet]). Surface wind data measured at an elevation of 1.5 meters from a  
39 nearby airport are typically used to describe surface characteristics for the site. Three airports  
40 exist within a 50-mile (80-kilometer) radius of the proposed EREF: Idaho Falls (31 kilometers  
41 [19 miles]), Pocatello (76 kilometers [47 miles]), and Rexburg (58 kilometers [36 miles]).  
42 Because of its proximity to the proposed EREF site, hourly surface meteorological data from  
43 Idaho Falls Fanning Field were used for estimating boundary layer parameters. Twice-daily  
44 upper soundings data from the NWS station in Boise, Idaho, were used. This station is located  
45 in the Western Snake River Plain and is the only station in Idaho at which upper soundings data  
46 are collected. The most recent five years (2004 to 2008) of meteorological data from the NWS  
47 station at the Idaho Falls Fanning Field Airport, together with meteorological data from MFC and  
48 upper sounding data from the NWS station in Boise, Idaho, were processed as inputs to the

1 AERMOD model. Table C-1 presents detailed information on surface, upper-air, and onsite  
 2 meteorological stations, data file formats, anemometer heights, and distance and direction from  
 3 the proposed EREF.  
 4

5 Typically, the wind speed threshold of sensors at monitoring stations not located at an airport is  
 6 low (e.g., 0.134 meter per second [0.440 feet per second] for the MFC data), but the wind speed  
 7 threshold for airport data is set at 1 meter per second (3.28 feet per second) by default in  
 8 AERMET. Accordingly, AERMOD modeling results using non-airport data could be higher than  
 9 using airport data. However, AERMOD tends to overpredict non-buoyant low-level releases in  
 10 low-wind speed conditions (Paine and Connors, 2009), resulting in a conservative estimation of  
 11 impact. An additional AERMOD run was made assuming the sensor threshold of 1 meter per  
 12 second (3.28 feet per second) to determine the sensitivity of the modeling results to sensor  
 13 threshold values. Tables C-2 and C-3 provide an indication of AERMOD’s sensitivity to wind  
 14 speed thresholds.  
 15

16 Figure C-1 presents a wind rose at the 10-meter (33-foot) level of the MFC station for the  
 17 2004–2008 period. The area experiences the predominant southwest–northeast wind flows at  
 18 the proposed EREF site. The mountains bordering the ESRP would act to channel the  
 19 prevailing west winds into a southwesterly flow due to the northeast–southwest orientation of  
 20 the ESRP between the bordering mountain ranges. The prevailing wind directions are from the  
 21 southwest (about 16 percent of the time) and secondarily from the south-southwest  
 22 (13.3 percent). Winds from northeast and north-northeast combined occur more than  
 23 18 percent of the time. In January, winds blow equally from south-southwest, north-northeast,  
 24 and northeast; in February, north-northeast winds prevail. From March through December,  
 25

**Table C-1 Meteorological Data Information**

Station Name	Station ID	Location (lat/long) <sup>a</sup>	Elevation (m)	File Format	Anemometer Height (m)	Distance & Direction from Proposed EREF <sup>a</sup>	Notes
<b>Surface</b>							
Idaho Falls Fanning Field	KIDA USAF: 725785 WBAN: 24145	43.517°N 112.067°W	1445	ISHD (TD-3505)	7.9	19 mi east-southeast	NA <sup>b</sup>
<b>Upper Air</b>							
Boise	BOI WBAN: 24131 WMO: 72681	43.57°N 116.22°W	871	FSL	NA	190 mi west	NA
<b>Onsite</b>							
Materials and Fuels Complex (MFC)	NA	43.594°N 112.652°W	1568	NA	10 and 76	11 mi west	Sensor threshold = 0.134 m/s

<sup>a</sup> Proposed EREF: latitude=43.585°N; longitude=112.425°W; elevation=1583 m.

<sup>b</sup> NA = not applicable.

Source: Hukari, 2009; NCDC, 2009c; NOAA, 2009.

**Table C-2 Maximum Air Quality Impacts Due to Emissions Associated with Construction Activities of the Proposed Eagle Rock Enrichment Facility in Idaho (Sensor Threshold = 0.134 meter per second [0.440 feet per second])**

Pollutant <sup>a</sup>	Averaging Time	Concentration ( $\mu\text{g}/\text{m}^3$ , except ppm for CO) <sup>b</sup>				Percent of NAAQS/SAAQs <sup>c</sup>	
		Maximum Increment <sup>d</sup>	Background <sup>e</sup>	Total	NAAQS/SAAQs	Increment	Total
CO	1 hour	0.8	4.3	5.1	35	2.4	14.6
	8 hours	0.1	2.1	2.2	9	1.5	24.9
NO <sub>2</sub>	Annual	1.0	11.3	12.3	100	1.0	12.3
SO <sub>2</sub>	3 hours	11.3	159.7	171.0	1300	0.9	13.2
	24 hours	1.8	62.8	64.6	365	0.5	17.7
	Annual	0.1	15.7	15.8	80	0.1	19.7
PM <sub>10</sub>	24 hours	355.2	52.0	407.2	150	236.8	271.5
	Annual	15.9	22.0	37.9	50	31.8	75.8
PM <sub>2.5</sub>	24 hours	15.9	21.0	36.9	35	45.3	105.3
	Annual	1.6	6.4	8.0	15	10.5	53.2

<sup>a</sup> CO = carbon monoxide; NO<sub>2</sub> = nitrogen dioxide; PM<sub>2.5</sub> = particulate matter  $\leq 2.5 \mu\text{m}$ ; PM<sub>10</sub> = particulate matter  $\leq 10 \mu\text{m}$ ; and SO<sub>2</sub> = sulfur dioxide.

<sup>b</sup> To convert  $\mu\text{g}/\text{m}^3$  to ppm for gaseous pollutants, such as SO<sub>2</sub> and NO<sub>2</sub>, divide values in  $\mu\text{g}/\text{m}^3$  by the product of 40.82 and the molecular weight.

<sup>c</sup> NAAQS = National Ambient Air Quality Standards; SAAQS = State Ambient Air Quality Standards.

<sup>d</sup> For short-term ( $\leq 24$  hours) averages, the highest of the second-highest modeled concentrations over five years is presented, except for PM<sub>10</sub> and PM<sub>2.5</sub>. For 24-hour PM<sub>10</sub>, high-6th-high over five years (2004–2008) is presented. For PM<sub>2.5</sub>, the highest of the five-year average of the 8th-highest concentration at each receptor is presented. For long-term (annual) average, the highest of the annual averages over five years is presented for NO<sub>2</sub> and SO<sub>2</sub>. The highest of multi-year averaged annual means across the receptors are presented for PM<sub>10</sub> and PM<sub>2.5</sub>.

<sup>e</sup> Source: Table 4-4.

winds blow predominantly from southwest or south-southwest. Average annual wind speed is about 4.1 meters per second (9.2 miles per hour), and relatively low calm winds are recorded about 0.17 percent of the time due to low sensor threshold. Wind speeds of 4.6 meters per second (10.4 miles per hour) are the highest in spring, reducing in summer and fall, and become the lowest at 3.4 meters per second (7.7 miles per hour) in winter.

#### C.4 Terrain Data Processing

The AERMAP terrain data preprocessor was used to account for the effects of terrain features. The terrain elevations for source and receptor locations were estimated based on the Digital Elevation Model (DEM) elevation data in the USGS DEM format (USGS, 2008). For the AERMOD modeling, 12 vertices for the construction site of about 75 hectares (185 acres) were identified, and sixty-two receptors were placed along the property line of the proposed EREF site, the overall size of which is about 208 hectares (515 acres). No offsite receptors were

**Table C-3 Maximum Air Quality Impacts Due to Emissions Associated with Construction Activities of the Proposed Eagle Rock Enrichment Facility in Idaho (Sensor Threshold = 1 meter per second [3.28 feet per second])**

Pollutant <sup>a</sup>	Averaging Time	Concentration ( $\mu\text{g}/\text{m}^3$ , except ppm for CO) <sup>b</sup>				Percent of NAAQS/SAQS <sup>c</sup>	
		Maximum Increment <sup>d</sup>	Background <sup>e</sup>	Total	NAAQS/SAQS	Increment	Total
CO	1 hour	0.3	4.3	4.6	35	0.9	13.2
	8 hours	0.1	2.1	2.2	9	0.8	24.1
NO <sub>2</sub>	Annual	0.8	11.3	12.1	100	0.8	12.1
SO <sub>2</sub>	3 hours	6.3	159.7	166.0	1300	0.5	12.8
	24 hours	1.0	62.8	67.8	365	0.3	17.5
	Annual	0.1	15.7	15.8	80	0.1	19.7
PM <sub>10</sub>	24 hours	189.9	52.0	241.9	150	126.6	161.3
	Annual	13.1	22.0	35.1	50	26.2	70.2
PM <sub>2.5</sub>	24 hours	12.0	21.0	33.0	35	34.1	94.1
	Annual	1.3	6.4	7.7	15	8.6	51.3

<sup>a</sup> CO = carbon monoxide; NO<sub>2</sub> = nitrogen dioxide; PM<sub>2.5</sub> = particulate matter  $\leq 2.5 \mu\text{m}$ ; PM<sub>10</sub> = particulate matter  $\leq 10 \mu\text{m}$ ; and SO<sub>2</sub> = sulfur dioxide.

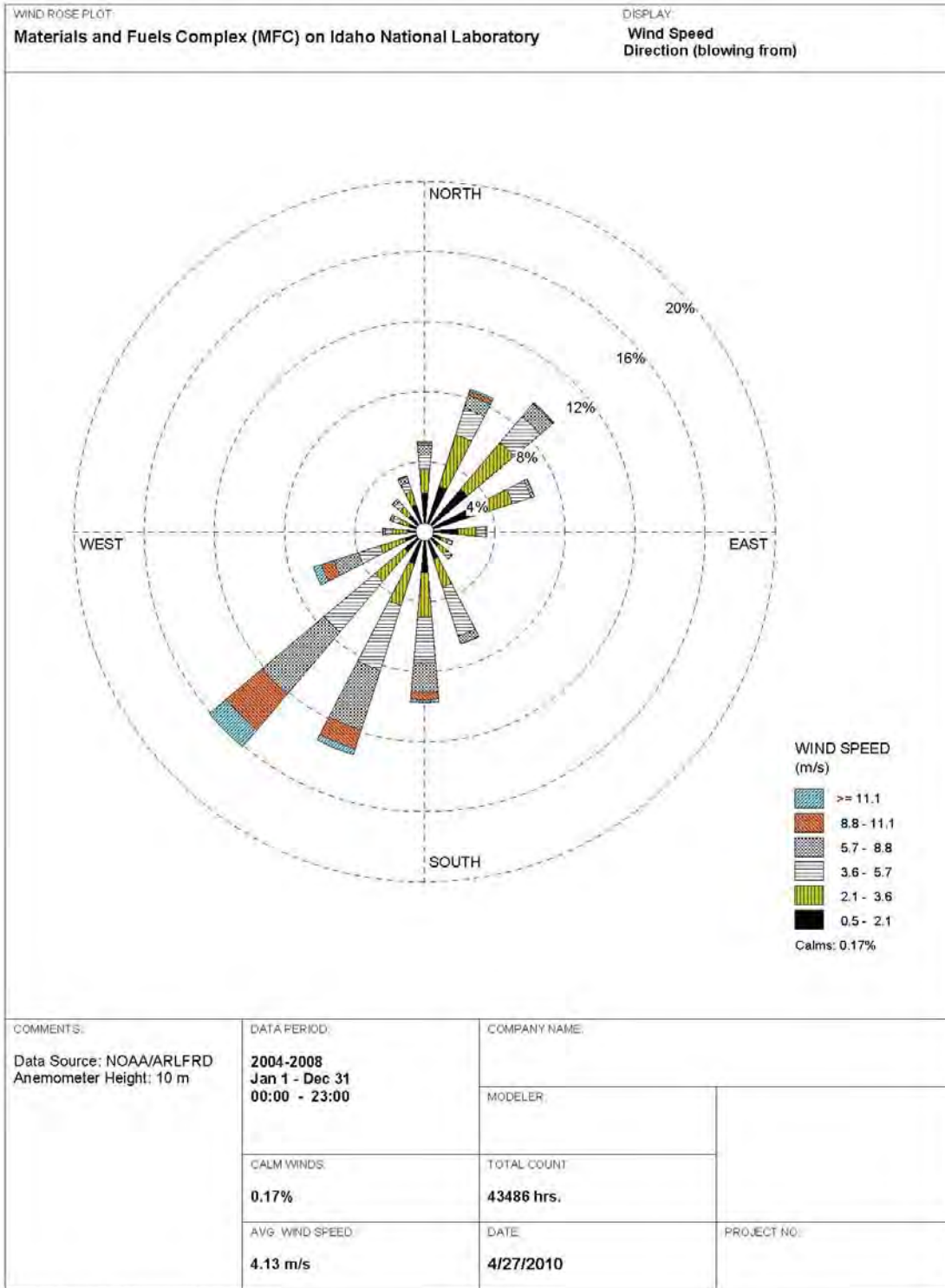
<sup>b</sup> To convert  $\mu\text{g}/\text{m}^3$  to ppm for gaseous pollutants, such as SO<sub>2</sub> and NO<sub>2</sub>, divide values in  $\mu\text{g}/\text{m}^3$  by the product of 40.82 and the molecular weight.

<sup>c</sup> NAAQS = National Ambient Air Quality Standards; SAAQS = State Ambient Air Quality Standards.

<sup>d</sup> For short-term ( $\leq 24$  hours) averages, the highest of the second-highest modeled concentrations over five years is presented except PM<sub>10</sub> and PM<sub>2.5</sub>. For 24-hour PM<sub>10</sub>, high-6th-high over five years (2004–2008) is presented. For PM<sub>2.5</sub>, the highest of the five-year average of the 8th-highest concentration at each receptor is presented. For long-term (annual) average, the highest of the annual averages over five years is presented for NO<sub>2</sub> and SO<sub>2</sub>. The highest of multi-year averaged annual means across the receptors are presented for PM<sub>10</sub> and PM<sub>2.5</sub>.

<sup>e</sup> Source: Table 4-6.

1  
2 established because most emission sources at the construction site would be either area  
3 sources or point/mobile sources with low stack height, resulting in most emissions being  
4 released at ground or near-ground level. Thus, maximum concentrations would occur in the  
5 immediate vicinity of the source and would be adequately reflected in property boundary  
6 receptors. The AREAPOLY source option was used to specify an area source as an irregularly  
7 shaped polygon of a construction site, and one elevation representative of the construction site  
8 was needed for input to the AERMOD. For receptors, AERMAP determines the elevations of  
9 receptors along with hill height scale, which is the elevation of the terrain feature that dominates  
10 the flow at a receptor of interest. The area surrounding the proposed EREF has no significant  
11 terrain features nearby, so hill height scales for all receptors were equal to their elevations.  
12  
13



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**Figure C-1 Wind Rose at 10-meter (33-foot) Level at the Meteorological Station near the Materials and Fuels Complex within the Idaho National Laboratory in Idaho, 2004–2008 (data from Hukari, 2009)**



1 **C.5 Modeling Assumptions**  
2

3 The following assumptions were established for air quality modeling and modeling result  
4 interpretations:

- 5
- 6 • Construction activities would occur 5 days/week (or 260 days per year) and 10 hours per  
7 day work schedule (7 am to 5 pm). In AERMOD, modeling was conducted for all 365 days  
8 in a year, and maximum 24-hour concentration and annual average concentrations were  
9 selected. Annual average concentrations were adjusted by multiplying the ratio of annual  
10 working days to the possible number of days in a year (260/365).  
11
  - 12 • Dry and wet deposition mechanisms are uncertain and are not recommended by EPA to be  
13 included in regulatory compliance decisions (EPA, 2005, 2009), and thus are not  
14 recommended for inclusion for typical applications unless special cases or objectives exist  
15 (e.g., deposition impacts on vegetation). Accordingly, no dry and wet depositions for  
16 construction-related PM modeling were assumed, i.e., conservatively, all PMs were  
17 presumed to be airborne.  
18
  - 19 • For the purpose of modeling demonstrations of compliance with the National Ambient Air  
20 Quality Standards (NAAQS), the following modeled concentrations were used for  
21 comparison with the NAAQS as recommended by EPA (EPA, 2005): highest of the second-  
22 highest modeled concentrations over five years were presented for 1-hour and 8-hour CO  
23 and 3-hour and 24-hour SO<sub>2</sub> and the highest of the annual averages over five years were  
24 presented for annual averages for SO<sub>2</sub> and NO<sub>2</sub>. For PM<sub>10</sub>, high-6th-high over five years  
25 (2004–2008) was presented. For PM<sub>2.5</sub>, the highest of the five-year average of the high-  
26 8th-high concentration at each receptor was presented. Highest of five-year average annual  
27 means across the receptors for PM<sub>10</sub> and PM<sub>2.5</sub> were presented.  
28
  - 29 • It was assumed that about 75 hectares (185 acres) would be disturbed in any year  
30 somewhere in the 208-hectare (515-acre) proposed EREF construction site. Accordingly,  
31 emissions corresponding to disturbance of 75 hectares (185 acres) were uniformly  
32 distributed over the 208-hectare (515-acre) proposed EREF construction site. Note that  
33 modeled concentration increments are expected to be higher than values predicted here  
34 when construction activities would occur near the construction site boundary.  
35

36 **C.6 Modeling Results**  
37

38 Air quality modeling estimates concentration increments over the background. To obtain total  
39 concentrations for comparison with applicable air quality standards, these modeled  
40 concentration increments were added to measured background concentrations at ambient air  
41 quality monitoring sites operated by the Idaho Department of Environmental Quality  
42 (see Table 4-4) that are representative of the proposed EREF site.  
43

44 To quantify the anticipated bias introduced by the AERMOD model in estimating dispersion  
45 concentrations in low wind speed conditions, the model was run at two low wind speed default  
46 values, 0.134 meters per second (0.440 feet per second) and the higher 1 meter per second  
47 (3.28 feet per second), with the results displayed in Tables C-2 and C-3, respectively. At either  
48 low wind speed default value, the model predicted exceedance of only the particulate standards.

1 However, allowing the model to use the higher low wind speed default value resulted in  
2 significant reductions in the extent to which the PM<sub>10</sub> standard was exceeded, 271.5 percent to  
3 161.3 percent, and reduced the anticipated dispersed concentrations of PM<sub>2.5</sub> from  
4 105.3 percent of the standard to 94.1 percent of the standard.  
5

6 During the construction phase, estimated maximum concentration increments and total  
7 concentrations are shown in Tables C-2 and C-3 for a given sensor threshold of 0.134 meter per  
8 second (0.440 feet per second) and a default AERMET sensor threshold of 1 meter per second  
9 (3.28 feet per second), respectively.  
10

## 11 **C.7 References**

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**APPENDIX D**  
**TRANSPORTATION METHODOLOGY, ASSUMPTIONS, AND IMPACTS**







## 1 **D.2.1 Routine Transportation Risk Methodology**

2  
3 The radiological risk associated with routine (incident-free) transportation is cargo-related and  
4 results from the potential exposure to low levels of external radiation near a loaded shipment. It  
5 is assumed that there are no cargo-related risks posed by incident-free transport of hazardous  
6 chemicals. No direct chemical exposure to radioactive material will occur during routine  
7 transport because, as discussed in Section D.2.2.2, the packaging is designed and maintained  
8 to ensure containment and shielding of contents during normal transport. Any leakage or  
9 unintended release of radiological or chemical material is considered under accident risks.

10  
11 Vehicle-related risks during routine transportation are caused by potential exposure to increased  
12 vehicular emissions. These emissions include diesel exhaust, tire and brake particulate  
13 emissions, and fugitive dust suspended from the roadbed by passing vehicles.

### 14 **D.2.1.1 Collective Population Risk**

15  
16  
17 The radiological risk associated with routine (incident-free) transportation results from the  
18 potential exposure to low-level external radiation in the vicinity of loaded shipments. Even  
19 under routine transportation conditions, some radiological exposure would occur. Because  
20 radiological consequences (dose) would occur as a direct result of normal operations, the  
21 probability of exposure is assumed to be 1 in RADTRAN 5. Because risk is typically defined as  
22 the product of probability and consequence/magnitude, the risk is then equivalent to the  
23 estimated dose. This risk is directly comparable to the accident risk discussed in Section D.2.2.

24  
25 For routine transportation, RADTRAN 5 considers major groups of potentially exposed persons  
26 and calculates exposure risks from routine highway transportation for the following population  
27 groups:

- 28  
29 • *Persons along the Route (Off-Link)*. Collective doses were calculated for all persons living  
30 or working within 0.8 kilometer (0.5 mile) of each side of a transportation route. The total  
31 number of persons within the 1.6-kilometer (1-mile) corridor was calculated separately for  
32 each route considered in the assessment.
- 33  
34 • *Persons Sharing the Route (On-Link)*. Collective doses were calculated for persons in all  
35 vehicles sharing the transportation route. This group includes persons traveling in the same  
36 or opposite directions as the shipment, as well as persons in vehicles passing the shipment.
- 37  
38 • *Persons at Stops*. Collective doses were calculated for persons who might be exposed  
39 while a shipment is stopped en route. For truck transportation, these stops include those for  
40 refueling, food, and rest.
- 41  
42 • *Crew Members*. Collective doses were calculated for truck transportation crew members  
43 involved in the actual shipment of material. Workers involved in loading or unloading were  
44 not considered.

45  
46 The doses calculated for the first three population groups were summed to yield the collective  
47 dose to the public; the dose calculated for the fourth group represents the collective dose to  
48 occupationally exposed workers.

1 The RADTRAN 5 calculations for routine dose generically compute the dose rate as a function  
2 of distance from a point source (Neuhauser and Kanipe, 2003). Associated with the calculation  
3 of routine doses for each exposed population group are parameters such as the radiation field  
4 strength, the source–receptor distance, the duration of exposure, vehicular speed, stopping  
5 time, traffic density, and route characteristics (such as population density). The RADTRAN  
6 manual contains derivations of the equations used and descriptions of these parameters  
7 (Neuhauser and Kanipe, 2003; Weiner et al., 2008).  
8

### 9 **D.2.1.2 Maximally Exposed Individual Risk**

10  
11 In addition to the assessment of the routine (incident-free) collective population risk, the risk to a  
12 maximally exposed individual (MEI) was estimated. In RADTRAN 5, the MEI is assumed to be  
13 located 30 meters (100 feet) from the transport route as the radioactive shipment passes at a  
14 speed of 24 kilometers per hour (15 miles per hour).  
15

### 16 **D.2.1.3 Vehicle-Related Risk**

17  
18 Vehicle-related health risks resulting from routine (incident-free) transportation are associated  
19 with the generation of air pollutants during shipment and are independent of cargo. The health  
20 endpoint assessed under routine transportation conditions was the excess latent mortality from  
21 inhalation of vehicular emissions. These emissions consist of particulate matter in the form of  
22 diesel engine exhaust, tire and brake particulates, and fugitive dust suspended from the  
23 roadway by transport vehicles. Vehicle-related risks from routine transportation were calculated  
24 for each shipment by multiplying the total distance traveled by the appropriate risk factor  
25 (i.e., for the specific type of vehicle) for pollutant inhalation, as discussed in Section D.3.6.  
26

## 27 **D.2.2 Accident Transportation Risk Methodology**

28  
29 The cargo-related radiological risk from transportation accidents is attributable to the potential  
30 release and dispersal of radioactive material into the environment during an accident and the  
31 subsequent exposure of the nearby population through multiple exposure pathways  
32 (i.e., inhalation, exposure to contaminated soil, or ingestion of contaminated food). Cargo-  
33 related hazardous chemical impacts on human health during transportation accidents arise from  
34 container failure and the inhalation of chemicals released during an accident.  
35

36 The risk analysis for potential accidents differs fundamentally from that of routine (incident-free)  
37 transportation because occurrences of accidents are statistical in nature and the accident risk  
38 assessment is treated probabilistically. Accident risk is defined as the product of the accident  
39 consequence (dose or exposure) and the probability of the accident occurring. In this respect,  
40 the analysis estimates the collective accident risk to populations by considering a spectrum of  
41 transportation-related accidents. The spectrum of accidents was designed to encompass a  
42 range of possible accidents, including low-probability accidents that have high consequences  
43 and high-probability accidents that have low consequences (such as “fender-benders”). For  
44 radiological risk, the results for collective accident risk can be directly compared to the results  
45 for routine collective risk because the latter results implicitly incorporate a probability of  
46 occurrence of 1 if the shipment takes place.  
47  
48

1 Vehicle-related accident risks refer to the potential for transportation-related accidents and  
2 resulting fatalities caused by physical trauma, both of which are independent of cargo.

### 3 4 **D.2.2.1 Radiological Accident Risk Assessment**

5  
6 The RADTRAN 5 calculation of collective accident risk uses models that quantify the range of  
7 potential accident severities and the responses of transported packages to accidents. The  
8 spectrum of accident severity is divided into several categories, each of which is assigned a  
9 conditional probability of occurrence – that is, the probability that if an accident occurs, it will be  
10 of a particular severity. Release fractions, defined as the fraction of the contents in a package  
11 that could be released in an accident, are assigned to each accident severity category on the  
12 basis of the physical and chemical form of the contents. The model takes into account the  
13 mode of transportation and the type of packaging through selection of the appropriate accident  
14 probabilities and release fractions, respectively. The accident rates, the definition of accident  
15 severity categories, and the release fractions used in this analysis are discussed further in  
16 Sections D.3.1.3, D.3.4.1, and D.3.4.2.

17  
18 For accidents involving the release of radioactive material, RADTRAN 5 assumes that the  
19 material is dispersed in the environment according to standard Gaussian diffusion models.  
20 For this risk assessment, default data for atmospheric dispersion were used, representing an  
21 instantaneous ground-level release and a small-diameter source cloud (Neuhauser and  
22 Kanipe, 2003). The calculation of the collective population dose following the release and  
23 dispersal of radioactive material includes the following exposure pathways:

- 24  
25 • external exposure to the passing radioactive cloud  
26  
27 • external exposure to contaminated ground  
28  
29 • internal exposure from inhalation of airborne contaminants  
30  
31 • internal exposure from the ingestion of contaminated food

32  
33 For the ingestion pathway, the fraction of farmland in each State traversed was used as input to  
34 the RADTRAN code. Farmland fraction is used by RADTRAN to consider the amount of  
35 farmland that could be contaminated as a result of an accident, and subsequently lead to the  
36 ingestion of contaminated foodstuffs. The majority of each shipping route is considered rural;  
37 urban and suburban segments are generally minimized when routing radiological materials.  
38 Doses of radiation from external exposure and the ingestion or inhalation of radionuclides were  
39 calculated by applying standard dose conversion factors (Eckerman and Ryman, 1993;  
40 ICRP, 1996).

### 41 42 **D.2.2.2 Chemical Accident Risk Assessment**

43  
44 The risks from exposure to hazardous chemicals during transportation-related accidents, can be  
45 either acute (resulting in immediate injury or fatality) or latent (resulting in cancer that would  
46 present itself after a period of several years). However, none of the chemicals that might be  
47 encountered in any of the transportation accidents involving UF<sub>6</sub> (i.e., HF and uranium

1 compounds) is carcinogenic. As a result, no excess chemically induced latent cancers would be  
2 expected from accidental chemical releases.

3  
4 The acute effects from uranium or HF intake considered were assumed to exhibit a threshold  
5 nonlinear relationship with exposure (i.e., some low level of exposure can be tolerated without  
6 inducing a health effect). To estimate risks, chemical-specific concentrations were developed  
7 for potential irreversible adverse effects (DOE, 1999a). All individuals exposed at these levels  
8 or higher following an accident were included in the transportation risk estimates.

9  
10 The primary exposure route of concern with respect to accidental release of hazardous  
11 chemicals would be inhalation. Although direct exposure to hazardous chemicals via other  
12 pathways such as ingestion or absorption through the skin (dermal absorption) would also be  
13 possible, these routes would be expected to result in much lower exposure than the inhalation  
14 pathway doses for hydrogen fluoride (HF) or uranium compounds. The likelihood of acute  
15 effects would be much lower for the ingestion and dermal pathways than for inhalation.

16  
17 The acute health effects end point – potential irreversible adverse effects – was considered for  
18 the assessment of cargo-related population impacts from transportation accidents involving  
19 hazardous chemicals. Past analyses of depleted UF<sub>6</sub> shipments have shown that the estimates  
20 of irreversible adverse effects to be approximately 1 to 3 orders of magnitude lower than the  
21 estimates of public latent cancer fatalities from radiological accident exposure (DOE, 2004a,b;  
22 NRC, 2005a). In addition, only one percent or fewer of persons experiencing irreversible  
23 adverse effects from exposure to HF or uranium compounds actually results in fatality  
24 (Policastro et al., 1997). Because radiological accident impacts would be SMALL and the  
25 relative chemical hazards would be even smaller, no further analysis of chemical hazards posed  
26 by transport was conducted for this EIS.

### 27 28 **D.2.2.3 Vehicle-Related Accident Risk Assessment**

29  
30 Vehicle-related accident risk refers to the potential for transportation accidents that could  
31 directly result in fatalities not related to the nature of the cargo. This risk represents fatalities  
32 from physical trauma, and State-average rates for transportation fatalities are used in the  
33 assessment. Vehicle-related accident risks are calculated by multiplying the total distance  
34 traveled by the State-specific rates for transportation fatalities. In all cases, the vehicle-related  
35 accident risks are calculated on the basis of distances for round-trip shipment, since the  
36 presence or absence of cargo is not a factor in accident frequency.

### 37 38 **D.3 Input Parameters and Assumptions**

39  
40 The principal input parameters and assumptions used in the transportation risk assessment are  
41 discussed in this section. Transportation of hazardous chemical and radioactive materials is  
42 governed by the *Hazardous Materials Transportation Act* and U.S. Department of  
43 Transportation (DOT), U.S. Nuclear Regulatory Commission (NRC), and U.S. Environmental  
44 Protection Agency (EPA) regulations. These regulations may be found in the U.S. *Code of*  
45 *Federal Regulations* (CFR) at 49 CFR Parts 171–178 and 383–397, 10 CFR Part 71, and  
46 40 CFR Parts 262 and 265, respectively. State organizations are also involved in regulating  
47 such transport within their borders. All transportation-related activities must be conducted in  
48 accordance with applicable regulations of these agencies. However, the DOT and NRC have



1 primary regulatory responsibility for shipment of radioactive materials. The regulations most  
2 pertinent to this risk assessment can be found in 49 CFR Part 173, 49 CFR Part 397, and  
3 10 CFR Part 71.

### 4 5 **D.3.1 Route Characteristics**

6  
7 The transportation route selected for a shipment determines the potentially exposed population  
8 and the expected frequency of transportation-related accidents. For truck transportation, the  
9 route characteristics most important to the risk assessment include the total shipping distance  
10 between each origin and destination and the population density along the route.

#### 11 12 **D.3.1.1 Route Selection**

13  
14 The DOT regulations concerning the routing of radioactive material shipments on public  
15 highways are prescribed in 49 CFR 397.101. The objectives of these regulations are to reduce  
16 the impacts of transporting radioactive materials, to establish consistent and uniform  
17 requirements for route selection, and to identify the role of State and local governments in  
18 routing radioactive materials. The regulations attempt to reduce potential hazards by  
19 prescribing that populous areas be avoided and that travel times be minimized. In addition, the  
20 regulations require that the carrier of radioactive materials ensures that the vehicle is operated  
21 on routes that minimize radiological risks, and that accident rates, transit times, population  
22 density and activity, time of day, and day of week are considered in determining risk. However,  
23 the final determination of the route is left to the discretion of the carrier.

24  
25 For this analysis, all domestic shipments to and from the proposed EREF are anticipated to  
26 occur via heavy haul tractor-trailer combination trucks. There is no rail infrastructure at the  
27 proposed site, and the closest rail access is at least 20 miles away (see Section 3.10).  
28 Representative shipping routes were identified using the WebTRAGIS (Version 4.6.2) routing  
29 model (Johnson and Michelhaugh, 2003) for all truck shipments. WebTRAGIS is a Web-based  
30 version of TRAGIS (Transportation Routing Analysis Geographic Information System) and is  
31 used to calculate highway, rail, or waterway routes within the United States. The routes were  
32 selected to be reasonable and consistent with routing regulations and general practice, but they  
33 are considered only representative because the actual routes used would be chosen in the  
34 future and are often determined by the shipper. At the time of shipment, route selection would  
35 reflect current road conditions, including road repairs and traffic congestion.

36  
37 The HIGHWAY data network in WebTRAGIS is a computerized road atlas that includes a  
38 complete description of the interstate highway system and of all U.S. highways. In addition,  
39 most principal State highways and many local and community highways are identified. The  
40 code is periodically updated to reflect current road conditions and has been compared with  
41 reported mileages and observations of commercial trucking firms (Johnson and  
42 Michelhaugh, 2003).

43  
44 Routes are calculated within the model by minimizing the total impedance between origin and  
45 destination. The impedance is a function of distance and driving time along a particular  
46 segment of highway. Table D-1 presents a matrix of the shipping origins and destinations for  
47 the various radioactive materials.

**Table D-1 Shipping Origins and Destinations<sup>a</sup>**

Site/Facility	Feed	Product	Depleted UF <sub>6</sub>	LLRW	Empty Feed	Empty Product	Empty Tails
Port Hope, ON	In				Out		
Metropolis, IL	In				Out		
Portsmouth, VA	In	Out			Out		In
Baltimore, MD	In	Out			Out		In
Columbia, SC		Out				In	
Richland, WA		Out				In	
Wilmington, NC		Out				In	
Clive, UT				Out			
Hanford, WA				Out			
Oak Ridge, TN				Out			
Paducah, KY			Out				In
Portsmouth, OH			Out				In

<sup>a</sup> In = incoming shipments to proposed EREF from origin; Out = outgoing shipments from proposed EREF to destination.

Source: AES, 2010.

1  
2 Even though transportation regulations do not require restricted routing for trucking shipment of  
3 natural uranium, low-enriched uranium, or depleted uranium, routing restrictions were applied as  
4 follows:

- 5  
6 • two drivers  
7  
8 • prohibit use of links prohibiting truck use  
9  
10 • prohibit use of ferry crossing; prohibit use of roads with hazardous materials prohibition  
11  
12 • Highway Route Controlled Quantity (HRCQ) preferred route  
13  
14 • prohibit use of roads with radioactive materials prohibition (HRCQ only)  
15

16 Table D-2 presents the output from WebTRAGIS that was used in this transportation  
17 assessment. For Port Hope, Ontario, an additional 241 kilometers (150 miles) of route distance  
18 and one inspection stop were added to the WebTRAGIS output to account for the portion of the  
19 route located in Canada.

20  
21 **D.3.1.2 Population Density**

22  
23 Three population density zones – rural, suburban, and urban – were used for the population risk  
24 assessment. The fractions of travel and average population density in each zone were

**Table D-2 Distance, Density, and Stop Information Generated by WebTRAGIS for Truck Route**

Facility	Stops		Link Type	Distance per Trip		Population Density	
	Inspect	Rest		(km)	(mi)	(No./km <sup>2</sup> )	(No./mi <sup>2</sup> )
Feed Conversion, Port Hope, ON <sup>a</sup>	9	8	Rural	2834.7	1761.7	11.9	30.8
			Suburban	803.8	499.5	305.5	791.3
			Urban	85.0	52.9	2311.0	5985.4
Feed Conversion, Metropolis, IL	6	6	Rural	2306.0	1432.9	9.4	24.3
			Suburban	470.1	292.1	325.3	842.6
			Urban	56.1	34.8	2199.6	5697.0
International Port, Portsmouth, VA	9	8	Rural	3091.4	1921.0	12.7	32.8
			Suburban	898.2	558.1	306.4	793.7
			Urban	71.0	44.1	2216.1	5739.8
International Port, Baltimore, MD	10	9	Rural	2839.4	1764.3	12.4	32.2
			Suburban	860.4	534.6	307.9	797.5
			Urban	91.8	57.0	2291.1	5934.0
Fuel Fabrication, Columbia, SC	10	9	Rural	2867.9	1782.1	11.2	29.0
			Suburban	850.7	528.6	314.4	814.2
			Urban	77.1	47.9	2184.6	5658.1
Fuel Fabrication, Richland, WA <sup>b</sup>	2	3	Rural	822.7	511.2	9.8	25.4
			Suburban	149.8	93.1	305.9	792.2
			Urban	17.2	10.7	2185.7	5661.0
Fuel Fabrication, Wilmington, NC	8	10	Rural	3027.5	1881.2	11.7	30.3
			Suburban	1021.5	634.8	328.6	851.0
			Urban	87.6	54.4	2158.9	5591.5
Waste Disposal, Clive, UT <sup>b</sup>	1	1	Rural	378.9	235.4	10.5	27.2
			Suburban	105.0	65.3	352.7	913.5
			Urban	21.4	13.3	2360.3	6113.3
Waste Disposal, Hanford, WA <sup>b</sup>	2	3	Rural	856.6	532.3	9.5	24.5
			Suburban	149.2	92.7	306.4	793.6
			Urban	16.9	10.5	2174.4	5631.6
Waste Disposal, Oak Ridge, TN	7	8	Rural	2639.9	1640.4	10.7	27.7
			Suburban	642.5	399.2	310.5	804.1
			Urban	65.6	40.7	2218.1	5744.8

**Table D-2 Distance, Density, and Stop Information Generated by WebTRAGIS for Truck Routes (Cont.)**

Facility	Stops		Link Type	Distance per Trip		Population Density	
	Inspect	Rest		(km)	(mi)	(No./km <sup>2</sup> )	(No./mi <sup>2</sup> )
Depleted UF <sub>6</sub> Conversion, Paducah, KY	7	6	Rural	2328.7	1447.0	9.5	24.6
			Suburban	478.2	297.1	324.9	841.4
			Urban	56.1	34.8	2199.6	5697.0
Depleted UF <sub>6</sub> Conversion, Portsmouth, OH	8	8	Rural	2684.5	1668.1	12.1	31.2
			Suburban	645.4	401.0	295.9	766.5
			Urban	51.2	31.8	2266.0	5869.0

<sup>a</sup> Includes an additional 241-kilometer (150-mile) segment and one inspection stop to account for the portion of the route located in Canada. Division of the additional segment by link type is consistent with the remainder of the route (rural 76.1 percent, suburban 21.6 percent, and urban 2.3 percent).

<sup>b</sup> Nodes to the west of the proposed EREF were blocked to route all shipping traffic through Idaho Falls, as proposed by AES (AES, 2010).

1  
2 determined using the WebTRAGIS routing model. Rural, suburban, and urban areas are  
3 characterized according to the following breakdown: rural population densities range from 0 to  
4 54 persons per square kilometer (0 to 139 persons per square mile); suburban densities range  
5 from 55 to 1284 persons per square kilometer (140 to 3326 persons per square mile); and urban  
6 covers all population densities greater than 1284 persons per square kilometer (3326 persons  
7 per square mile). Use of these population density zones is based on an aggregation of the  
8 11 population density zones provided in the WebTRAGIS model output (DOE, 2002). For  
9 calculation purposes, information about population density was generated at the State level and  
10 used as RADTRAN input for all routes. The population densities along a route are derived from  
11 2000 Census data from the U.S. Census Bureau. Route-average population densities and other  
12 route characteristics are provided in Table D-2.

13  
14 **D.3.1.3 Accident and Fatality Rates**

15  
16 For calculating accident risks, vehicle accident involvement and fatality rates are taken from  
17 data provided in Saricks and Tompkins (1999). For each transport mode, accident rates are  
18 generically defined as the number of accident involvements (or fatalities) in a given year per unit  
19 distance of travel by that mode in the same year. Accident rates are derived from multiple-year  
20 averages that automatically account for such factors as heavy traffic and adverse weather  
21 conditions. For assessment purposes, the total number of expected accidents or fatalities is  
22 calculated by multiplying the total shipping distance by the appropriate accident or fatality rate.

23  
24 For truck transportation, the rates presented by Saricks and Tompkins (1999) are specifically for  
25 heavy combination trucks involved in interstate commerce. Heavy combination trucks are rigs  
26 composed of a separable tractor unit containing the engine and one to three freight trailers  
27 connected to each other and the tractor. Heavy combination trucks are typically used for  
28 shipping radiological materials that would be transported to and from the proposed EREF.  
29 Truck accident rates are computed for each State on the basis of statistics compiled by the DOT

1 Office of Motor Carriers for 1994 to 1996. Saricks and Tompkins (1999) present accident  
2 involvement and fatality counts, estimated kilometers of travel by State, and the corresponding  
3 average accident involvement and fatality rates for the three years investigated. Fatalities  
4 (including of crew members) are deaths that are attributable to the accident and that occurred  
5 within 30 days of the accident.  
6

7 The truck accident assessment presented in this EIS uses accident (fatality) rates for travel on  
8 interstate highways. The total accident risk for a route depends on the total distance traveled in  
9 each State along the route and does not rely on national average accident statistics. However,  
10 for comparative purposes, the national average truck accident rate on interstate highways  
11 presented in Saricks and Tompkins (1999) is  $3.15 \times 10^{-7}$  accident per truck-kilometer  
12 ( $5.07 \times 10^{-7}$  accident per mile). Note that the accident rates used in this assessment were  
13 computed using all interstate highway shipments (regardless of the cargo), as 10 CFR Part 71  
14 requires that HRCQ shipments be made over the interstate highway system.  
15

### 16 **D.3.2 Packaging**

17

18 As noted in Section D.3, radioactive materials transported to and from the proposed EREF  
19 would be subject to both DOT and NRC shipping regulations. All shipments of  $UF_6$  can be  
20 transported in Type A shipping containers having thermal protection (e.g., overpack or other  
21 protective assembly) that meets DOT (49 CFR Part 173) and NRC (10 CFR Part 71)  
22 requirements. Shipments of the product material are required to have fissile controls in addition  
23 to the thermal protection. However, in this assessment of the radiological impacts, any  
24 reduction in exposures due to the presence of a thermal and/or fissile overpack is ignored.  
25 Packaging for radioactive materials must be designed, constructed, and maintained to ensure  
26 that it will contain and shield the contents during normal transportation. For more highly  
27 radioactive material, the packaging must also contain and shield the contents in severe  
28 accidents. The type of packaging used is determined by the radioactive hazard associated with  
29 the packaged material. Table D-3 summarizes the shipment packaging for the shipments  
30 considered.  
31

32 The uranium feed, depleted tails, and LLRW shipments would use Type A packaging. This type  
33 of packaging must withstand the conditions of normal transportation without loss or dispersal of  
34 the radioactive contents. "Normal" transportation refers to all transportation conditions except  
35 those resulting from accidents or sabotage. Approval of Type A packaging is obtained by  
36 demonstrating that the packaging can withstand specified testing conditions intended to  
37 simulate normal transportation. Type A packaging usually does not require special handling,  
38 packaging, or transportation equipment. The  $UF_6$  feed and tails would be shipped in  
39 Type 48Y cylinders (USEC, 1999), and LLRW would be shipped in 55-gallon drums. The  
40 specifications for a Type 48Y cylinder are shown in Figure D-1 and Table D-4.  
41

42 The enriched product would be shipped in Type 30B cylinders (USEC, 1999) within Type B  
43 overpacks. Figure D-2 and Table D-5 show the specifications of a 30B cylinder. In addition to  
44 meeting all Type A standards, Type B packaging must also provide a high degree of assurance  
45 that the package integrity will be maintained even during severe accidents, with essentially no  
46 loss of the radioactive contents or serious impairment of the shielding capability. Type B  
47 packaging must satisfy stringent testing criteria (as specified in 10 CFR 71.73) that were  
48 developed to simulate conditions of severe hypothetical accidents, including impact, puncture,

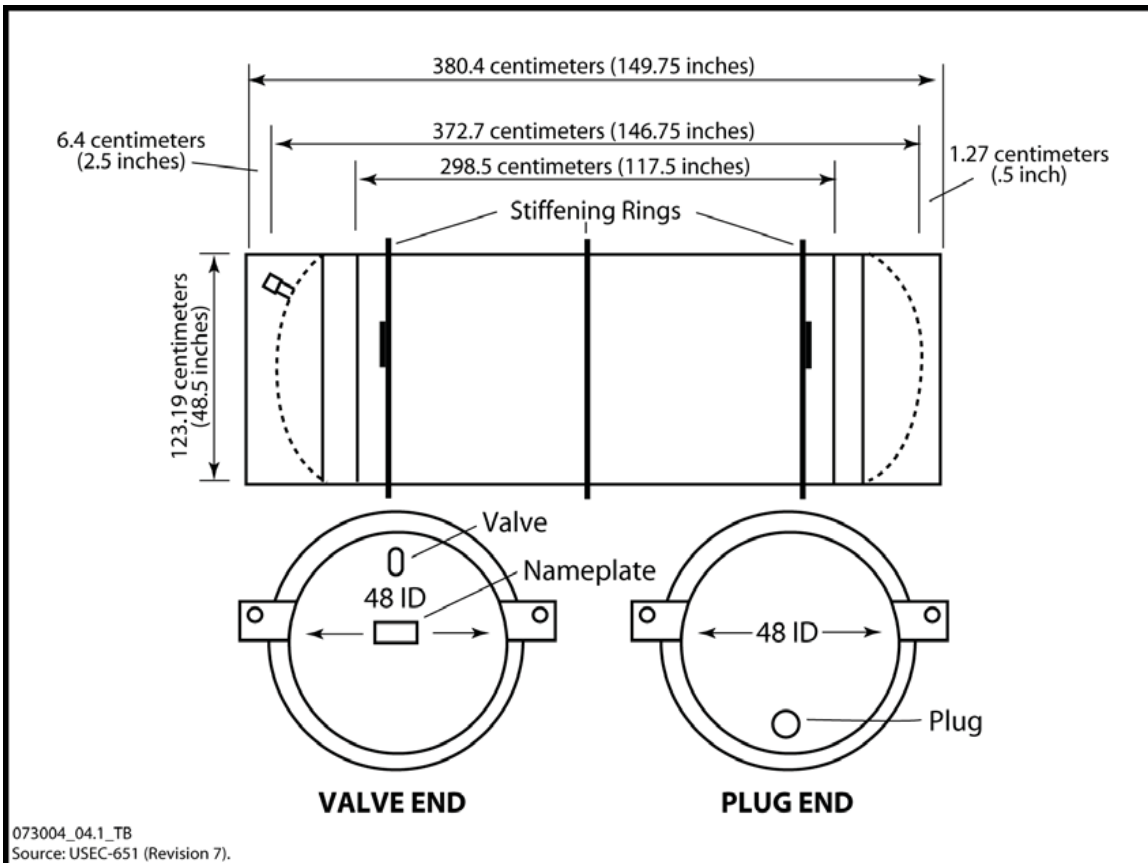


**Table D-3 Annual Number of Containers and Trucks Required for Transport**

Material	Type of Container	Number per Year	
		Containers	Trucks
Natural UF <sub>6</sub>	48Y	1424	1424
Enriched UF <sub>6</sub>	30B	1032	516
Depleted UF <sub>6</sub>	48Y	1222	1222
LLRW	55-gallon drum	954	16
Empty feed cylinders	48Y	1424	712
Empty product cylinders	30B	1032 <td 516	
Empty depleted UF <sub>6</sub> cylinders	48Y	1222	611

Source: AES, 2010.

1



2

3

4

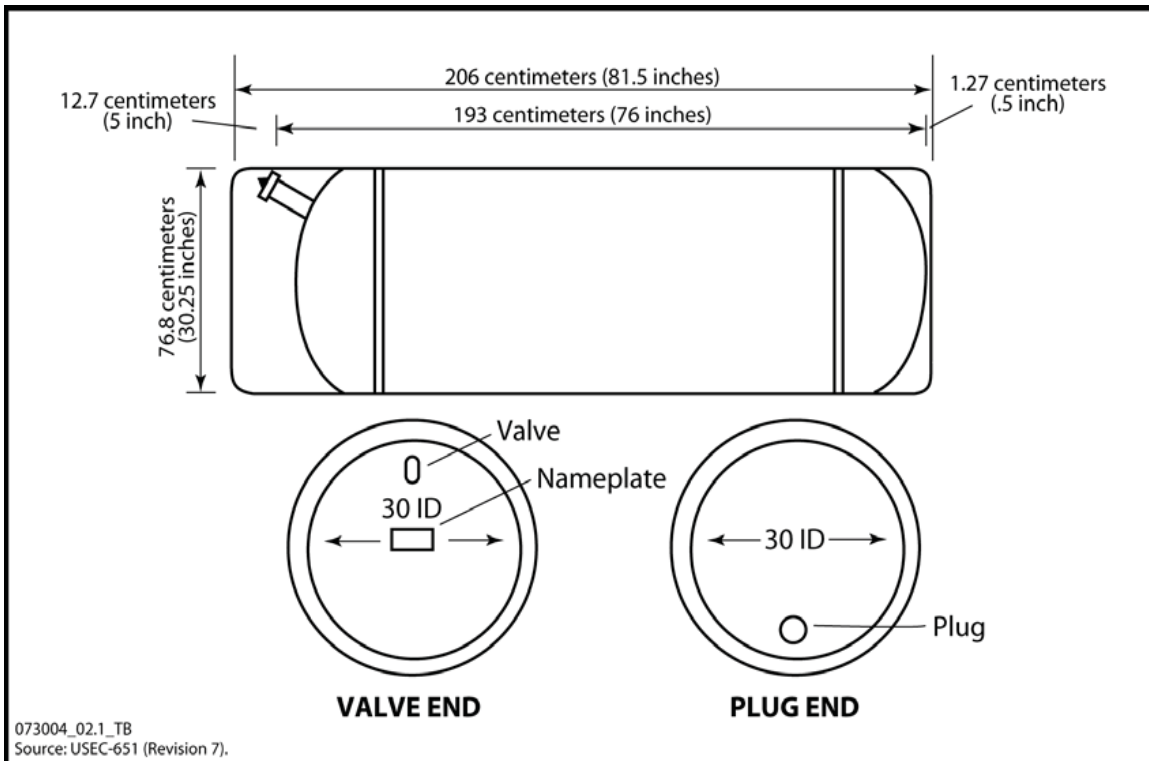
**Figure D-1 Schematic of a Type 48Y Cylinder (USEC, 1995)**

**Table D-4 Type 48Y Cylinder Specifications**

Parameter	Value
Nominal diameter	122 centimeters (48 inches)
Nominal length	380 centimeters (150 inches)
Wall thickness	1.6 centimeters (0.625 inches)
Nominal tare weight	2359 kilograms (5200 pounds)
Maximum net weight	12,500 kilograms (27,560 pounds)
Nominal gross weight	14,860 kilograms (32,760 pounds)
Minimum volume	4.04 cubic meters (142.7 cubic feet)
Basic material of construction	Steel: ASTM A-516
Service pressure	1380 kilopascals gage (200 pounds per square inch gage)
Hydrostatic test pressure	2760 kilopascals gage (400 pounds per square inch gage)
Isotopic content limit	4.5 percent <sup>235</sup> U (maximum with moderation control)
Valve used	2.54-centimeter valve (1-inch valve)

Source: USEC, 1995.

1



2

3

4

**Figure D-2 Schematic of a Type 30B Cylinder (USEC, 1995)**

**Table D-5 Type 30B Cylinder Specifications**

Parameter	Value
Nominal diameter	76 centimeters (30 inches)
Nominal length	206 centimeters (81 inches)
Wall thickness	1.27 centimeters (0.5 inches)
Nominal tare weight	635 kilograms (1400 pounds)
Maximum net weight	2300 kilograms (5000 pounds)
Nominal gross weight	2900 kilograms (6400 pounds)
Minimum volume	736 liters (26 cubic feet)
Basic material of construction	Steel: ASTM A-516
Service pressure	1380 kilopascals gage (200 pounds per square inch gage)
Hydrostatic test pressure	2760 kilopascals gage (400 pounds per square inch gage)
Isotopic content limit	5.0 percent <sup>235</sup> U (maximum with moderation control)
Valve used	2.54-centimeter valve (1-inch valve)

Source: USEC, 1995.

1  
2 fire, and immersion in water. For shipping Type 30B cylinders, a UX-30 overpack would be  
3 used (to provide protection and convenience in handling through consolidation). The UX-30 has  
4 a diameter of 1.10 meters (43.5 inches) and is 2.44 meters (96 inches) in length (NRC, 2009).

5  
6 **D.3.3 Shipment Configurations and Number of Shipments**

7  
8 Several different types of radioactive materials are proposed for shipment to and from the  
9 proposed EREF. Table D-6 presents the activity (amount) of each radionuclide that would be  
10 present in containers of feed, product, depleted uranium, and LLRW. Previous EISs have  
11 incorporated one year of decay to account for delay in shipping between the generation of  
12 depleted UF<sub>6</sub> and any radioactive shipments. Due to the anticipated time frame of startup for  
13 the proposed EREF and the impending availability of DOE conversion services, there is no  
14 assurance that such decay would occur prior to shipment. Therefore, it was not considered in  
15 this analysis.

16  
17 The radionuclide inventories for the radioactive material shipments presented in Table D-6  
18 include a number of short-lived radionuclides that are not included in the RADTRAN 5 default  
19 library of radionuclides. Due to their short half-lives and relatively low activity, these  
20 radionuclides do not significantly contribute to the population dose in an accident scenario  
21 (incident-free doses are based on exterior dose rates and are not directly dependent on  
22 radionuclide inventory). These short-lived radionuclides are assumed to be in equilibrium with  
23 their parent radionuclides, so their internal dose contributions are included in the internal dose  
24 conversion factors of the parent radionuclides. Furthermore, this simplifying assumption is  
25 counterbalanced by the conservative assumption that there would be no decay period between  
26 generation and shipment. Therefore, use of the RADTRAN 5 default library of radionuclides in  
27 this analysis was considered adequate.

**Table D-6 Curie Inventory in Selected Shipping Containers for Truck Transportation**

Radionuclide	Feed (natural UF <sub>6</sub> )	Product (enriched UF <sub>6</sub> )	Depleted Uranium (tails/ depleted UF <sub>6</sub> )	Depleted UF <sub>6</sub> Residue (heels)	Empty Product	LLRW
Thallium-207	$3.84 \times 10^{-8}$	$4.92 \times 10^{-8}$	$1.94 \times 10^{-8}$	$6.96 \times 10^{-11}$	$2.45 \times 10^{-10}$	$1.01 \times 10^{-11}$
Thallium-208	$1.77 \times 10^{-15}$	$2.26 \times 10^{-15}$	$8.94 \times 10^{-16}$	$3.20 \times 10^{-18}$	$1.13 \times 10^{-17}$	$4.63 \times 10^{-19}$
Lead-210	$3.76 \times 10^{-11}$	$5.68 \times 10^{-11}$	$1.80 \times 10^{-11}$	$6.83 \times 10^{-14}$	$2.83 \times 10^{-13}$	$9.87 \times 10^{-15}$
Lead-211	$3.85 \times 10^{-8}$	$4.93 \times 10^{-8}$	$1.95 \times 10^{-8}$	$6.98 \times 10^{-11}$	$2.45 \times 10^{-10}$	$1.01 \times 10^{-11}$
Lead-212	$4.92 \times 10^{-15}$	$6.30 \times 10^{-15}$	$2.49 \times 10^{-15}$	$8.92 \times 10^{-18}$	$3.14 \times 10^{-17}$	$1.29 \times 10^{-18}$
Lead-214	$3.74 \times 10^{-9}$	$5.64 \times 10^{-9}$	$1.79 \times 10^{-9}$	$6.79 \times 10^{-12}$	$2.81 \times 10^{-11}$	$9.82 \times 10^{-13}$
Bismuth-210	$3.76 \times 10^{-11}$	$5.68 \times 10^{-11}$	$1.80 \times 10^{-11}$	$6.83 \times 10^{-14}$	$2.83 \times 10^{-13}$	$9.87 \times 10^{-15}$
Bismuth-211	$3.85 \times 10^{-8}$	$4.93 \times 10^{-8}$	$1.95 \times 10^{-8}$	$6.98 \times 10^{-11}$	$2.45 \times 10^{-10}$	$1.01 \times 10^{-11}$
Bismuth-212	$4.92 \times 10^{-15}$	$6.30 \times 10^{-15}$	$2.49 \times 10^{-15}$	$8.92 \times 10^{-18}$	$3.14 \times 10^{-17}$	$1.29 \times 10^{-18}$
Bismuth-214	$3.74 \times 10^{-9}$	$5.64 \times 10^{-9}$	$1.79 \times 10^{-9}$	$6.79 \times 10^{-12}$	$2.81 \times 10^{-11}$	$9.82 \times 10^{-13}$
Polonium-210	$1.21 \times 10^{-11}$	$1.82 \times 10^{-11}$	$5.78 \times 10^{-12}$	$2.19 \times 10^{-14}$	$9.08 \times 10^{-14}$	$3.17 \times 10^{-15}$
Polonium-211	$1.08 \times 10^{-10}$	$1.38 \times 10^{-10}$	$5.46 \times 10^{-11}$	$1.96 \times 10^{-13}$	$6.87 \times 10^{-13}$	$2.83 \times 10^{-14}$
Polonium-212	$3.15 \times 10^{-15}$	$4.03 \times 10^{-15}$	$1.60 \times 10^{-15}$	$5.71 \times 10^{-18}$	$2.01 \times 10^{-17}$	$8.26 \times 10^{-19}$
Polonium-214	$3.74 \times 10^{-9}$	$5.64 \times 10^{-9}$	$1.79 \times 10^{-9}$	$6.79 \times 10^{-12}$	$2.81 \times 10^{-11}$	$9.82 \times 10^{-13}$
Polonium-215	$3.85 \times 10^{-8}$	$4.93 \times 10^{-8}$	$1.95 \times 10^{-8}$	$6.98 \times 10^{-11}$	$2.45 \times 10^{-10}$	$1.01 \times 10^{-11}$
Polonium-216	$4.92 \times 10^{-15}$	$6.30 \times 10^{-15}$	$2.49 \times 10^{-15}$	$8.92 \times 10^{-18}$	$3.14 \times 10^{-17}$	$1.29 \times 10^{-18}$
Polonium-218	$3.74 \times 10^{-9}$	$5.65 \times 10^{-9}$	$1.79 \times 10^{-9}$	$6.79 \times 10^{-12}$	$2.81 \times 10^{-11}$	$9.82 \times 10^{-13}$
Radon-219	$3.85 \times 10^{-8}$	$4.93 \times 10^{-8}$	$1.95 \times 10^{-8}$	$6.98 \times 10^{-11}$	$2.45 \times 10^{-10}$	$1.01 \times 10^{-11}$
Radon-220	$4.92 \times 10^{-15}$	$6.30 \times 10^{-15}$	$2.49 \times 10^{-15}$	$8.92 \times 10^{-18}$	$3.14 \times 10^{-17}$	$1.29 \times 10^{-18}$
Radon-222	$3.74 \times 10^{-9}$	$5.65 \times 10^{-9}$	$1.79 \times 10^{-9}$	$6.79 \times 10^{-12}$	$2.81 \times 10^{-11}$	$9.82 \times 10^{-13}$
Francium-223	$6.13 \times 10^{-10}$	$7.85 \times 10^{-10}$	$3.10 \times 10^{-10}$	$1.11 \times 10^{-12}$	$3.91 \times 10^{-12}$	$1.61 \times 10^{-13}$
Radium-223	$3.85 \times 10^{-8}$	$4.93 \times 10^{-8}$	$1.95 \times 10^{-8}$	$6.98 \times 10^{-11}$	$2.45 \times 10^{-10}$	$1.01 \times 10^{-11}$
Radium-224	$4.92 \times 10^{-15}$	$6.30 \times 10^{-15}$	$2.49 \times 10^{-15}$	$8.92 \times 10^{-18}$	$3.14 \times 10^{-17}$	$1.29 \times 10^{-18}$
Radium-226	$3.74 \times 10^{-9}$	$5.65 \times 10^{-9}$	$1.79 \times 10^{-9}$	$6.79 \times 10^{-12}$	$2.81 \times 10^{-11}$	$9.82 \times 10^{-13}$
Radium-228	$4.41 \times 10^{-14}$	$5.65 \times 10^{-14}$	$2.23 \times 10^{-14}$	$8.01 \times 10^{-17}$	$2.81 \times 10^{-16}$	$1.16 \times 10^{-17}$
Actinium-227	$4.44 \times 10^{-8}$	$5.69 \times 10^{-8}$	$2.25 \times 10^{-8}$	$8.06 \times 10^{-11}$	$2.83 \times 10^{-10}$	$1.17 \times 10^{-11}$
Actinium-228	$4.41 \times 10^{-14}$	$5.65 \times 10^{-14}$	$2.23 \times 10^{-14}$	$8.01 \times 10^{-17}$	$2.82 \times 10^{-16}$	$1.16 \times 10^{-17}$
Thorium-227	$3.79 \times 10^{-8}$	$4.85 \times 10^{-8}$	$1.92 \times 10^{-8}$	$6.87 \times 10^{-11}$	$2.41 \times 10^{-10}$	$9.94 \times 10^{-12}$
Thorium-228	$4.91 \times 10^{-15}$	$6.29 \times 10^{-15}$	$2.49 \times 10^{-15}$	$8.91 \times 10^{-18}$	$3.13 \times 10^{-17}$	$1.29 \times 10^{-18}$
Thorium-230	$1.73 \times 10^{-5}$	$2.61 \times 10^{-5}$	$8.27 \times 10^{-6}$	$3.13 \times 10^{-8}$	$1.30 \times 10^{-7}$	$4.53 \times 10^{-9}$

**Table D-6 Curie Inventory in Selected Shipping Containers for Truck Transportation (Cont.)**

Radionuclide	Feed (natural UF <sub>6</sub> )	Product (enriched UF <sub>6</sub> )	Depleted Uranium (tails/depleted UF <sub>6</sub> )	Depleted UF <sub>6</sub> Residue (heels)	Empty Product	LLRW
Thorium-231	$1.30 \times 10^{-1}$	$1.67 \times 10^{-1}$	$6.58 \times 10^{-2}$	$2.36 \times 10^{-4}$	$8.29 \times 10^{-4}$	$3.41 \times 10^{-5}$
Thorium-232	$8.83 \times 10^{-13}$	$1.13 \times 10^{-12}$	$4.47 \times 10^{-13}$	$1.60 \times 10^{-15}$	$5.63 \times 10^{-15}$	$2.32 \times 10^{-16}$
Thorium-234	$2.82 \times 10^0$	$4.92 \times 10^{-1}$	$2.83 \times 10^0$	$5.12 \times 10^{-3}$	$2.45 \times 10^{-3}$	$7.41 \times 10^{-4}$
Protactinium-231	$2.80 \times 10^{-6}$	$3.58 \times 10^{-6}$	$1.42 \times 10^{-6}$	$5.07 \times 10^{-9}$	$1.78 \times 10^{-8}$	$7.34 \times 10^{-10}$
Protactinium-234m	$2.82 \times 10^0$	$4.92 \times 10^{-1}$	$2.83 \times 10^0$	$5.12 \times 10^{-3}$	$2.45 \times 10^{-3}$	$7.41 \times 10^{-4}$
Protactinium-234	$3.67 \times 10^{-3}$	$6.39 \times 10^{-4}$	$3.68 \times 10^{-3}$	$6.66 \times 10^{-6}$	$3.18 \times 10^{-6}$	$9.63 \times 10^{-7}$
Uranium-234	$1.92 \times 10^0$	$2.90 \times 10^0$	$9.18 \times 10^{-1}$	0	0	$5.04 \times 10^{-4}$
Uranium-235	$1.30 \times 10^{-1}$	$1.67 \times 10^{-1}$	$6.58 \times 10^{-2}$	0	0	$3.41 \times 10^{-5}$
Uranium-236	$1.79 \times 10^{-2}$	$2.29 \times 10^{-2}$	$9.06 \times 10^{-3}$	0	0	$4.69 \times 10^{-6}$
Uranium-238	$2.82 \times 10^0$	$4.92 \times 10^{-1}$	$2.83 \times 10^0$	0	0	$7.41 \times 10^{-4}$

Source: AES, 2010.

1  
2 Table D-3 presents the number of packages and number of shipments that would be required  
3 for transport to and from the proposed EREF. Uranium feed and depleted tails shipments would  
4 consist of one Type 48Y cylinder per truck, and each cylinder would contain about 12.4 metric  
5 tons (13.7 tons) of natural or depleted UF<sub>6</sub>. Enriched UF<sub>6</sub> product would be shipped in  
6 Type 30B cylinders in UX-30 overpacks, two cylinders per truck (although up to five cylinders  
7 could be shipped per truck). Each 30B cylinder would contain approximately 2.3 metric tons  
8 (2.5 tons) of product. Low-level radioactive waste would be shipped in 55-gallon waste drums,  
9 60 drums per truck. The types and amounts of LLRW that would be shipped are discussed in  
10 Section 4.2.9.2.

11  
12 **D.3.4 Accident Characteristics**

13  
14 Assessment of transportation accident risk takes into account the potential severity of  
15 transportation-related accidents and the fraction of package contents that would be released to  
16 the environment during an accident (commonly referred to as the release fraction). The method  
17 used to characterize accident severities and the corresponding release fractions for estimating  
18 both radioactive and chemical risks are described below.

19  
20 **D.3.4.1 Accident Severity Categories**

21  
22 A method to characterize the potential severity of transportation-related accidents is described  
23 in NUREG-0170, *Final Environmental Statement on the Transportation of Radioactive Material*



1 by Air and Other Modes (NRC, 1977), and presented in *A Resource Handbook on DOE*  
2 *Transportation Risk Assessment* (DOE, 2002). The NRC method divides the spectrum of  
3 accident severities into eight categories, which are further subdivided into population zones  
4 (rural, suburban, and urban) containing the fraction of occurrence within each zone. Other  
5 studies have divided the same accident spectrum into six categories (Wilmot, 1981),  
6 20 categories (Fischer et al., 1987), or more (Sprung et al., 2000). However, these latter  
7 studies focused primarily on accidents involving shipments of spent nuclear fuel. In this  
8 analysis, the NUREG-0170 scheme was used for all shipments.

9  
10 The NUREG-0170 scheme for truck transportation accident classification is shown in  
11 Figure D-3. Severity is described as a function of the magnitudes of the mechanical forces  
12 (impact) and thermal forces (fire) to which a package may be subjected during an accident.  
13 Because all accidents can be described in these terms, severity is independent of the specific  
14 accident sequence. In other words, any sequence of events that results in an accident in which  
15 a package is subjected to forces within a certain range of values is assigned to the accident  
16 severity category associated with that range. The scheme for accident severity is designed to  
17 take into account all credible transportation-related accidents, including those accidents with low  
18 probability but high consequences and those with high probability but low consequences.

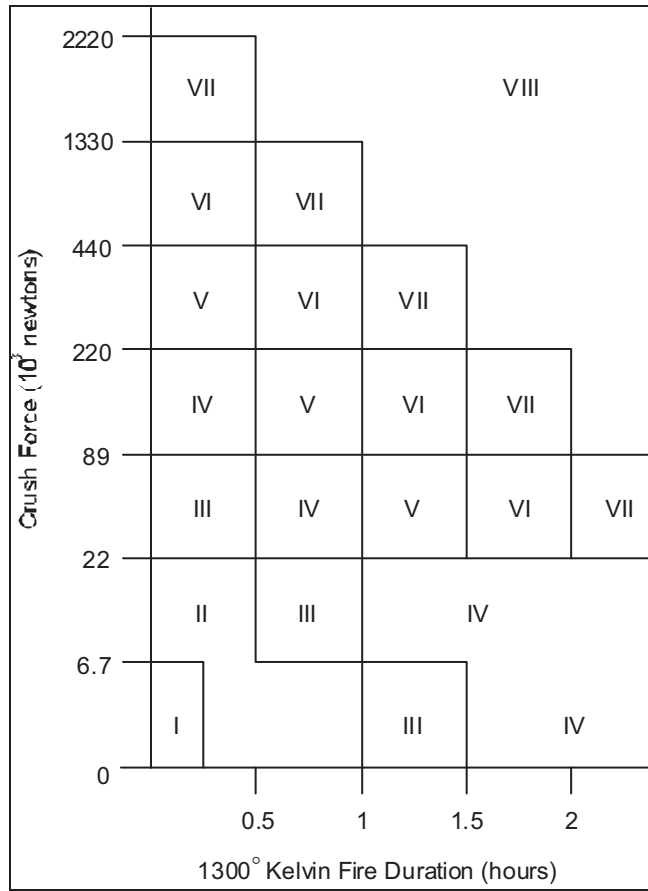
19  
20 Each severity category represents a set of accident scenarios defined by a combination of  
21 mechanical and thermal forces. A conditional probability of occurrence (i.e., the probability that  
22 if an accident occurs, it is of a particular severity) is assigned to each category. These fractional  
23 occurrences (conditional probabilities) for accidents by accident severity category and  
24 population density zone are shown in Table D-7 and are used for estimating the radiological  
25 transportation risks.

26  
27 Category I accidents are the least severe but the most frequent; Category VIII accidents are  
28 very severe but very infrequent. To determine the expected frequency of an accident of a given  
29 severity, the conditional probability in the category is multiplied by the accident rate  
30 (see Section D.3.1.3). Each population density zone has a distinct distribution of accident  
31 severities related to differences in average vehicular velocity, traffic density, location (rural,  
32 suburban, or urban), and other factors.

#### 33 34 **D.3.4.2 Package Release Fractions**

35  
36 In NUREG-0170, radiological and chemical consequences are calculated by assigning package  
37 release fractions to each accident severity category. The release fraction is defined as the  
38 fraction of package contents that could be released from the package as the result of an  
39 accident of a given severity. Release fractions take into account all mechanisms necessary to  
40 create release of material from a damaged package to the environment. The release fraction is  
41 a function of the severity of the accident, the packaging, and the physical form of the material.  
42 For instance, a low-impact accident, such as a “fender-bender,” would not be expected to cause  
43 any release of material. Conversely, a severe accident would be expected to release nearly all  
44 of the material in a shipment into the environment.

45  
46 Representative release fractions for accidents involving all shipments were taken from  
47 NUREG-0170 (NRC, 1977), for both Type A and Type B packages. The recommendations in  
48 NUREG-0170 were based on best engineering judgments and have been shown to provide



1  
2  
3  
4

**Figure D-3 Scheme for NUREG-0170 Classification by Accident Severity Category for Truck Accidents (NRC, 1977)**

**Table D-7 Fractional Occurrences for Accidents by Severity Category and Population Density Zone**

Severity Category	Fractional Occurrence	Fractional Occurrence by Population Zone		
		Low (Rural)	Medium (Suburban)	High (Urban)
I	0.55	0.1	0.1	0.8
II	0.36	0.1	0.1	0.8
III	0.07	0.3	0.4	0.3
IV	0.016	0.3	0.4	0.3
V	0.0028	0.5	0.3	0.2
VI	0.0011	0.7	0.2	0.1
VII	$8.50 \times 10^{-5}$	0.8	0.1	0.1
VIII	$1.50 \times 10^{-5}$	0.9	0.05	0.05

Source: NRC, 1977; DOE, 2002.

5

1 conservative estimates of material releases following accidents (Sprung et al., 2000). Release  
 2 fractions for accidents of each severity category are provided in Table D-8. As indicated in the  
 3 table, the amount of material released from a package ranges from zero for minor accidents to  
 4 100 percent for the most severe accidents.

5  
 6 Also important for the purposes of risk assessment are the fraction of the released material that  
 7 can be entrained in an aerosol (part of an airborne contaminant plume) and the fraction of the  
 8 aerosolized material that is respirable (of a size that can be inhaled into the lungs). These  
 9 fractions depend on the physical form of the material. Most solid materials are difficult to  
 10 release in particulate form and are, therefore, relatively nondispersible. Conversely, liquid or  
 11 gaseous materials are relatively easy to release if the container is breached in an accident. The  
 12 aerosolized fraction and respirable fraction for all radiological shipments were conservatively  
 13 assumed to be 1 for all accidents involving Type A packages (Table D-8). These values are  
 14 conservative due to the lack of data on package failure under severe conditions (DOE, 2002).

15  
 16 **D.3.4.3 Atmospheric Conditions during Accidents**

17  
 18 Hazardous material released to the atmosphere is transported by wind. The amount of  
 19 dispersion, or dilution, of the contaminant depends on the meteorologic conditions at the time of  
 20 the accident. Because predicting the specific location of a transportation-related accident and  
 21 the exact meteorologic conditions at the time of the accident is impossible, generic atmospheric  
 22 conditions were selected for the accident risk assessment. Neutral weather conditions were  
 23 assumed, represented by Pasquill atmospheric stability Class D with a wind speed of 4 meters  
 24 per second (9 miles per hour). Because neutral meteorological conditions are the most  
 25 frequently occurring atmospheric stability condition in the United States, these conditions are  
 26 most likely to be present in the event of an accident involving a hazardous material shipment.  
 27 Observations at National Weather Service meteorological stations at more than 300 U.S.  
 28 locations indicate that on a yearly average, neutral conditions (represented by Pasquill  
 29 Classes C and D) occur about half (50 percent) the time; stable conditions (Pasquill Classes E  
 30 and F) occur about one-third (33 percent) of the time; and unstable conditions (Pasquill  
 31 Classes A and B) occur about one-sixth (17 percent) of the time (Doty et al., 1976). The neutral  
 32

**Table D-8 Fraction of Package Released, Aerosolized, and Respirable**

<b>Accident Severity</b>	<b>Release</b>	<b>Respirable</b>	<b>Aerosolized</b>
I	0	1	1
II	0.01	1	1
III	0.1	1	1
IV	1	1	1
V	1	1	1
VI	1	1	1
VII	1	1	1
VIII	1	1	1

Source: DOE, 2002.

1 category predominates in all seasons, but it is most prevalent (nearly 60 percent of the  
2 observations) during winter.

### 4 **D.3.5 Radiological Risk Assessment Input Parameters and Assumptions**

5  
6 The dose (and the corresponding risk) to populations during routine (incident-free)  
7 transportation of radioactive materials is directly proportional to the assumed external dose rate  
8 from the shipment. The actual dose rate from the shipment is a complex function of the  
9 composition and configuration of shielding and containment materials used in the packaging,  
10 the geometry of the loaded shipment, and the characteristics of the contents.

11  
12 Table D-9 provides a summary of information from various sources regarding estimates of the  
13 external radiation near each type of shipping container. For the purposes of this EIS, the NRC  
14 staff has assumed the most conservative dose rate for each type of container. Dose rates are  
15 presented in terms of the transport index (TI), which is the dose rate at 1 meter (3 feet) from the  
16 surface of a package. The regulatory limit established in 49 CFR 173.441 and 10 CFR 71.47 to  
17 protect the public is 0.1 millisievert per hour (10 millirem per hour) at 2 meters (6 feet) from the  
18 outer lateral sides of the transport vehicle.

19  
20 Note that in Table D-9 the external radiation levels for an empty cylinder (Type 48Y or 30B) are  
21 higher than those for a full cylinder. This occurs for two reasons. First, after UF<sub>6</sub> (feed, product,  
22 or depleted tail) is removed from a cylinder, the radioactive uranium daughter products that build  
23 up due to the radioactive decay of uranium collect at the bottom and form what is known as a  
24 "heel." The nature of the radiation emitted from the uranium daughter products results in a  
25 greater release of gamma radiation than occurs from just uranium. Second, uranium is very  
26 dense and an effective shield material for gamma radiation. When a cylinder is full of UF<sub>6</sub>, the  
27 uranium daughters are distributed throughout the cylinder and emitted radiation must pass  
28 through a significant thickness of uranium (and thus can be stopped or absorbed by the  
29 uranium). Only gamma emissions from uranium daughters near the inner surface of the  
30 cylinder can penetrate the cylinder and contribute to a nearby person's radiation exposure.  
31 Because an empty cylinder contains largely vapor and no longer has the high shielding  
32 capability of solid UF<sub>6</sub>, and because the heel concentrates the more highly radioactive uranium  
33 daughters next to the inner surface of the cylinder, the radiation levels near an empty cylinder  
34 are higher than those for a full UF<sub>6</sub> cylinder.

35  
36 In addition to the specific parameters discussed previously, values for a number of general  
37 parameters must be specified within RADTRAN to calculate radiological risks. These general  
38 parameters define basic characteristics of the shipment and traffic and are specific to the mode  
39 of transportation; they include the speed of the vehicle, size of the crew, amount of time the  
40 shipment is stopped for rest or inspection, and density of the population sharing the shipping  
41 route. The RADTRAN user manual (Neuhauser and Kanipe, 2003; Weiner et al., 2008)  
42 contains derivations and descriptions of these parameters. The general RADTRAN input  
43 parameters used in the radiological transportation risk assessment are summarized in  
44 Table D-10; default RADTRAN values were used for input parameters not described in this  
45 appendix.

**Table D-9 Direct Radiation Surrounding Shipping Containers<sup>a</sup>**

Container	Assumed Dose Rate (mrem/hr)	Measured/Estimated Dose Rate (mrem/hr)	Source
Feed (48Y)	1.0	0.7	NRC, 2006; Table D-7
		0.2	NRC, 2005b; Table 4.12, C-8
		0.29	NRC, 2005b; Table D-7
Product (30B)	1.0	0.4	NRC, 2006; Table D-7
		0.19	NRC, 2005b; Table D-7
Depleted UF <sub>6</sub>	1.0	1.0	DOE, 1999a; Sec. J.3.2.1.1
		0.28	NRC, 2005b; Table D-7
		0.23 (min)	Biwer et al., 2001; Table 5.4
		0.46 (max)	Biwer et al., 2001; Table 5.4
LLRW	1.0	1.0	NRC, 2006; Table D-7
		1.0	DOE, 2002; Table 4.2
		0.0042	NRC, 2005b; Table D-7
		0.5 (min)	Biwer et al., 2001; Table 5.4
		1.0 (max)	Biwer et al., 2001; Table 5.4
Empty feed	3.0	1.0	NRC, 2005b; Table C-8, D-7
		1.0	NRC, 2006; Table D-7
		3.0	AES, 2010
Empty product	5.0	1.0	Biwer et al., 2001; Table 5.4
		5.0	AES, 2010
Empty depleted UF <sub>6</sub>	3.0	1.0	Biwer et al., 2001; Table 5.4
		3.0	AES, 2010

<sup>a</sup> At one meter.

To convert from millirem to millisievert, multiply by  $1 \times 10^{-2}$ .

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12

### D.3.6 Routine Nonradiological Vehicle Emission Risks

Vehicle-related risks during incident-free transportation include incremental risks caused by potential exposure to airborne particulate matter from fugitive dust (resuspended particulates from the roadway) and diesel exhaust emissions. The health end point assessed under routine (incident-free) transport conditions is the excess (additional) latent mortality caused by inhalation of vehicular emissions. Strong epidemiological evidence suggests that increases in ambient air concentrations of PM<sub>10</sub> (particulate matter with a mean aerodynamic diameter less than or equal to 10 microns) lead to increases in mortality (EPA, 1996a,b). Currently, it is assumed that no threshold exists and that the dose–response functions for most health effects associated with PM<sub>10</sub> exposure, including premature mortality, are linear over the concentration



**Table D-10 RADTRAN 5 Input Parameters**

Parameter	Link Type	Value
Traffic volume (vehicles/hour) <sup>a</sup>	Rural	1155
	Suburban	2414
	Urban	5490
Vehicle speed (kph [mph])	Rural	88 (55)
	Suburban	40 (25)
	Urban	24 (15)
Number of people in adjacent vehicle		2
Crew size		2
Distance from source to crew (m)		5
Stop time (h/km) <sup>b</sup>		0.0014
Population density at stops <sup>b</sup>	1 to 10 meters	30,000
	10 to 800 meters	340
Latest cancer risk (fatal cancer per person-rem) <sup>c</sup>		$6.0 \times 10^{-4}$
Vehicle emission rate (fatalities/km per 1 person/km <sup>2</sup> )		$8.36 \times 10^{-10}$
Vehicle accident (fatalities/km) <sup>d</sup>		$1.42 \times 10^{-8}$

<sup>a</sup> Previous EISs (and previous versions of RADTRAN) used values of 530, 760, and 2400. However, these values may underestimate current average traffic density on interstate highways (Weiner et al., 2008), which accounts for most of the mileage on routes used in this analysis.

<sup>b</sup> Hostick et al., 1992.

<sup>c</sup> EPA, 1999; ISCORS, 2002.

<sup>d</sup> In lieu of a national average vehicle accident rate, state-specific rates were used (Saricks and Tompkins, 1999).

1  
2 ranges investigated (EPA, 1996a). Over short and long terms, fatalities (mortality) may result  
3 from life-shortening respiratory or cardiovascular diseases (EPA, 1996a; Ostro and  
4 Chestnut, 1998). The long-term fatalities are also assumed to include those from cancer.

5  
6 The increased ambient air particulate concentrations caused by the transport vehicle have been  
7 related to premature latent fatalities in the form of risk factors for transportation risk  
8 assessments (Biwer and Butler, 1999). A conservative vehicle emission risk factor of  
9  $8.36 \times 10^{-10}$  latent fatalities per kilometer for truck transport (Biwer and Butler, 1999) was used in  
10 this assessment. This value is for heavy combination trucks (Class VIII B) and for areas with  
11 unit population density of one person per square kilometer (2.6 persons per square mile). One-  
12 way shipment risks are obtained by multiplying the vehicle emission risk factor by the average  
13 population density along the route and the route distance. The routine vehicle risks reported in  
14 this analysis are for round-trip travel of the transport vehicle.  
15

1 The vehicle risks reported here are estimates based on the best available data. However, as is  
2 true for radiological risks, there is a large and not readily quantifiable degree of uncertainty in  
3 the vehicle emission risk factors. For example, large uncertainties exist as to the extent of  
4 increased mortality with an incremental rise in particulate air concentrations and as to whether  
5 there are threshold air concentrations that are applicable. Also, estimates of the particulate air  
6 concentrations caused by transport vehicles are dependent on location, road conditions, vehicle  
7 conditions, and weather.

8  
9 As discussed by Biber and Butler (1999), there are also large uncertainties in the human health  
10 risk factors used to develop the emission risks. In addition, due to the conservatism in the  
11 assumptions made by Biber and Butler to reconcile results with those presented by EPA  
12 (EPA, 1993), latent fatality risks estimated with the above risk factor may be considered to be  
13 near an upper bound (Biber and Butler, 1999). Use of this risk factor for Class VIII B trucks will  
14 give estimated fatalities comparable to those from accident fatalities in some cases. In addition,  
15 what exactly constitutes a fatality as a direct consequence of increased PM<sub>10</sub> levels from vehicle  
16 emissions is an open question, but long-term fatalities have been associated with increased  
17 levels of PM<sub>10</sub> (Biber and Butler, 1999).

#### 18 19 **D.4 Summary of Transportation Impacts**

20  
21 Table D-11 presents the estimated annual radiological and nonradiological impacts from truck  
22 shipment of radioactive material, including collective population risk from incident-free transport,  
23 latent cancer fatalities from the vehicle emissions, and fatalities from traffic accidents.

24 Table D-12 presents the estimated radiological impacts from potential accidents during these  
25 shipments, including the contributions of each exposure pathway to the collective population  
26 dose. The accident results are presented in terms of risk, which involves weighting the impact  
27 of the various accident scenarios by the frequency that the accident scenario occurs.

28  
29 The impact results in Table D-11 include a range of values for each type of shipment. This  
30 range represents the lowest to highest impact for the various proposed shipping routes. For  
31 example, for the feed materials, the values represent one year of shipments from any of the four  
32 feed supply locations to the proposed EREF. If some feed materials were provided from one  
33 location and the remaining amounts from another, the estimated impacts would fall somewhere  
34 between the low and high values (impacts could be evaluated by multiplying the fraction of  
35 material from a given location by the impacts from that location plus the fraction of material from  
36 a second location multiplied by the impacts from the second location).

37  
38 To evaluate the total impacts from the transportation of radioactive materials, a scenario must  
39 be defined and the impacts from the various materials/routes can be summed. For example,  
40 the proposed EREF would receive feed material from Metropolis, Illinois, the product material  
41 would be shipped to Wilmington, North Carolina, LLRW would be shipped to Clive, Utah, and  
42 depleted UF<sub>6</sub> would be shipped to Paducah, Kentucky. The impacts from these materials/routes  
43 would then be summed to determine the total impacts for this scenario. Table 4-11 of this EIS  
44 summarizes the potential transportation impacts, presented as a range of collective risk for each  
45 type of shipment and the range of impacts summed over all shipping scenarios.

**Table D-11 Annual Collective Population Risks from Truck Transportation**

Material	Total Mileage (km)	Cargo-Related Radiological Impacts										Vehicle-Related Impacts	
		Dose Risk (person-rem)					Latent Cancer Fatalities					Latent Emission Fatalities	Physical Accident Fatalities
		Routine Crew	Public Off-Link	Public On-Link	Public Stop	Total Public	Maximum Individual	Accident	Crew	Public			
Feed, Port Hope, ON	5,302,406	$1.6 \times 10^1$	$5.7 \times 10^0$	$1.8 \times 10^2$	$1.2 \times 10^2$	$3.1 \times 10^2$	$1.9 \times 10^{-4}$	$1.1 \times 10^1$	$9.6 \times 10^{-3}$	$1.9 \times 10^{-1}$	$5.7 \times 10^{-1}$	$7.5 \times 10^{-2}$	
Feed, Metropolis, IL	4,033,480	$1.2 \times 10^1$	$3.8 \times 10^0$	$6.4 \times 10^1$	$9.4 \times 10^1$	$1.6 \times 10^2$	$1.9 \times 10^{-4}$	$1.1 \times 10^1$	$7.2 \times 10^{-3}$	$9.6 \times 10^{-2}$	$3.5 \times 10^{-1}$	$5.7 \times 10^{-2}$	
Feed, Baltimore, MD	5,399,096	$1.7 \times 10^1$	$6.6 \times 10^0$	$1.3 \times 10^2$	$1.3 \times 10^2$	$2.7 \times 10^2$	$1.9 \times 10^{-4}$	$8.0 \times 10^0$	$1.0 \times 10^{-2}$	$1.6 \times 10^{-1}$	$6.1 \times 10^{-1}$	$7.7 \times 10^{-2}$	
Feed, Portsmouth, VA	5,782,010	$1.8 \times 10^1$	$6.8 \times 10^0$	$1.3 \times 10^2$	$1.4 \times 10^2$	$2.8 \times 10^2$	$1.9 \times 10^{-4}$	$1.1 \times 10^1$	$1.1 \times 10^{-2}$	$1.7 \times 10^{-1}$	$5.6 \times 10^{-1}$	$8.2 \times 10^{-2}$	
Product, Columbia, SC	1,958,736	$4.6 \times 10^0$	$2.4 \times 10^0$	$4.5 \times 10^1$	$4.6 \times 10^1$	$5.2 \times 10^1$	$6.9 \times 10^{-5}$	$8.5 \times 10^0$	$2.8 \times 10^{-3}$	$3.1 \times 10^{-2}$	$2.0 \times 10^{-1}$	$2.8 \times 10^{-2}$	
Product, Richland, WA	510,634	$1.1 \times 10^0$	$4.2 \times 10^{-1}$	$9.4 \times 10^0$	$1.2 \times 10^1$	$2.2 \times 10^1$	$6.9 \times 10^{-5}$	$1.4 \times 10^0$	$6.6 \times 10^{-4}$	$1.3 \times 10^{-2}$	$3.9 \times 10^{-2}$	$7.3 \times 10^{-3}$	
Product, Wilmington, NC	2,134,589	$5.1 \times 10^0$	$3.0 \times 10^0$	$5.2 \times 10^1$	$5.0 \times 10^1$	$1.1 \times 10^2$	$6.9 \times 10^{-5}$	$9.6 \times 10^0$	$3.1 \times 10^{-3}$	$6.6 \times 10^{-2}$	$2.4 \times 10^{-1}$	$3.0 \times 10^{-2}$	
Product, Baltimore, MD	1,956,414	$4.6 \times 10^0$	$2.4 \times 10^0$	$4.8 \times 10^1$	$4.5 \times 10^1$	$9.5 \times 10^1$	$6.9 \times 10^{-5}$	$9.8 \times 10^0$	$2.8 \times 10^{-3}$	$5.7 \times 10^{-2}$	$2.2 \times 10^{-1}$	$2.8 \times 10^{-2}$	
Product, Portsmouth, VA	2,095,166	$4.8 \times 10^0$	$2.5 \times 10^0$	$8.9 \times 10^1$	$4.9 \times 10^1$	$1.4 \times 10^2$	$6.9 \times 10^{-5}$	$6.5 \times 10^0$	$2.9 \times 10^{-3}$	$8.4 \times 10^{-2}$	$2.0 \times 10^{-1}$	$3.0 \times 10^{-2}$	
Depleted UF <sub>6</sub> /tails, Paducah, KY	3,498,830	$1.0 \times 10^1$	$3.3 \times 10^0$	$7.0 \times 10^1$	$8.2 \times 10^1$	$1.6 \times 10^2$	$1.6 \times 10^{-4}$	$7.4 \times 10^0$	$6.0 \times 10^{-3}$	$9.6 \times 10^{-2}$	$3.1 \times 10^{-1}$	$5.0 \times 10^{-2}$	
Empty feed, Port Hope, ON	2,651,203	$2.3 \times 10^1$	$8.6 \times 10^0$	$2.7 \times 10^2$	$1.7 \times 10^2$	$4.5 \times 10^2$	$2.9 \times 10^{-4}$	$2.7 \times 10^5$	$1.4 \times 10^{-2}$	$2.7 \times 10^{-1}$	$2.8 \times 10^{-1}$	$3.8 \times 10^{-2}$	
Depleted UF <sub>6</sub> /tails, Portsmouth, OH	4,131,704	$1.3 \times 10^1$	$4.1 \times 10^0$	$8.1 \times 10^1$	$9.6 \times 10^1$	$1.8 \times 10^2$	$1.6 \times 10^{-4}$	$5.3 \times 10^0$	$7.8 \times 10^{-3}$	$1.1 \times 10^{-1}$	$3.5 \times 10^{-1}$	$5.9 \times 10^{-2}$	

**Table D-11 Annual Collective Population Risks from Truck Transportation (Cont.)**

Material	Total Mileage (km)	Cargo-Related Radiological Impacts										Vehicle-Related Impacts			
		Dose Risk (person-rem)										Latent Cancer Fatalities		Latent Emission Fatalities	
		Routine Crew	Public Off-Link	Public Link	Public On-Stop	Public Stop	Total Public	Maximum Individual	Accident	Crew	Public	Latent Emission Fatalities	Physical Accident Fatalities		
Empty feed, Metropolis, IL	2,016,740	$1.8 \times 10^1$	$5.7 \times 10^0$	$1.2 \times 10^2$	$1.4 \times 10^2$	$2.7 \times 10^2$	$2.9 \times 10^4$	$2.8 \times 10^{-5}$	$1.1 \times 10^{-2}$	$1.6 \times 10^{-1}$	$1.8 \times 10^{-1}$	$2.9 \times 10^2$			
Empty feed, Baltimore, MD	2,699,548	$2.6 \times 10^1$	$9.8 \times 10^0$	$2.0 \times 10^2$	$1.9 \times 10^2$	$4.0 \times 10^2$	$2.9 \times 10^4$	$4.1 \times 10^{-5}$	$1.6 \times 10^{-2}$	$2.4 \times 10^{-1}$	$3.0 \times 10^{-1}$	$3.8 \times 10^2$			
Empty feed, Portsmouth, VA	2,891,005	$2.7 \times 10^1$	$1.0 \times 10^1$	$1.9 \times 10^2$	$2.0 \times 10^2$	$4.0 \times 10^2$	$2.9 \times 10^4$	$2.8 \times 10^{-5}$	$1.6 \times 10^{-2}$	$2.4 \times 10^{-1}$	$2.8 \times 10^{-1}$	$4.1 \times 10^2$			
Empty product, Columbia, SC	1,958,736	$2.3 \times 10^1$	$1.2 \times 10^1$	$2.3 \times 10^2$	$2.3 \times 10^2$	$4.7 \times 10^2$	$3.5 \times 10^4$	$1.7 \times 10^{-5}$	$1.4 \times 10^{-2}$	$2.8 \times 10^{-1}$	$2.0 \times 10^{-1}$	$2.8 \times 10^2$			
Empty product, Richland, WA	510,634	$5.5 \times 10^0$	$2.1 \times 10^0$	$4.7 \times 10^1$	$5.9 \times 10^1$	$1.1 \times 10^2$	$3.5 \times 10^4$	$2.8 \times 10^{-6}$	$3.3 \times 10^{-3}$	$6.6 \times 10^2$	$3.9 \times 10^2$	$7.3 \times 10^3$			
Empty product, Wilmington, NC	2,134,589	$2.5 \times 10^1$	$1.5 \times 10^1$	$2.6 \times 10^2$	$2.5 \times 10^2$	$5.3 \times 10^2$	$3.5 \times 10^4$	$2.0 \times 10^{-5}$	$1.5 \times 10^{-2}$	$3.2 \times 10^{-1}$	$2.4 \times 10^{-1}$	$3.0 \times 10^2$			
Empty depleted UF <sub>6</sub> /tails, Port Hope, ON	2,275,120	$2.0 \times 10^1$	$7.3 \times 10^0$	$2.3 \times 10^2$	$1.5 \times 10^2$	$3.9 \times 10^2$	$2.5 \times 10^4$	$2.3 \times 10^{-5}$	$1.2 \times 10^{-2}$	$2.3 \times 10^{-1}$	$2.4 \times 10^{-1}$	$3.2 \times 10^2$			
Empty depleted UF <sub>6</sub> /tails, Metropolis, IL	1,730,658	$1.5 \times 10^1$	$4.9 \times 10^0$	$1.0 \times 10^2$	$1.2 \times 10^2$	$2.2 \times 10^2$	$2.5 \times 10^4$	$2.3 \times 10^{-5}$	$9.0 \times 10^{-3}$	$1.3 \times 10^{-1}$	$1.5 \times 10^{-1}$	$2.5 \times 10^2$			
Empty depleted UF <sub>6</sub> /tails, Baltimore, MD	2,316,607	$2.2 \times 10^1$	$8.5 \times 10^0$	$1.7 \times 10^2$	$1.6 \times 10^2$	$3.4 \times 10^2$	$2.5 \times 10^4$	$4.2 \times 10^{-5}$	$1.3 \times 10^{-2}$	$2.0 \times 10^{-1}$	$2.6 \times 10^{-1}$	$3.3 \times 10^2$			
Empty depleted UF <sub>6</sub> /tails, Portsmouth, VA	2,480,904	$2.3 \times 10^1$	$8.8 \times 10^0$	$1.6 \times 10^2$	$1.7 \times 10^2$	$3.4 \times 10^2$	$2.5 \times 10^4$	$2.3 \times 10^{-5}$	$1.4 \times 10^{-2}$	$2.0 \times 10^{-1}$	$2.4 \times 10^{-1}$	$3.5 \times 10^2$			
Empty depleted UF <sub>6</sub> /tails, Paducah, KY	1,749,415	$1.6 \times 10^1$	$5.0 \times 10^0$	$8.4 \times 10^1$	$1.2 \times 10^2$	$2.1 \times 10^2$	$2.5 \times 10^4$	$2.3 \times 10^{-5}$	$9.6 \times 10^{-3}$	$1.3 \times 10^{-1}$	$1.5 \times 10^{-1}$	$2.5 \times 10^2$			

**Table D-11 Annual Collective Population Risks from Truck Transportation (Cont.)**

Material	Total Mileage (km)	Cargo-Related Radiological Impacts										Vehicle-Related Impacts			
		Dose Risk (person-rem)										Latent Cancer Fatalities		Latent Emission Fatalities	
		Routine Crew	Public Off-Link	Public Link	Public Stop	Total Public	Maximum Individual	Accident	Crew	Public	Latent Emission Fatalities	Physical Accident Fatalities			
Empty depleted UF <sub>6</sub> /tails, Portsmouth, OH	2,065,852	$1.9 \times 10^1$	$6.2 \times 10^0$	$1.2 \times 10^2$	$1.4 \times 10^2$	$2.7 \times 10^2$	$2.5 \times 10^4$	$1.7 \times 10^{-5}$	$1.1 \times 10^{-2}$	$1.6 \times 10^{-1}$	$1.7 \times 10^{-1}$	$1.7 \times 10^{-1}$	$2.9 \times 10^{-2}$		
Solid waste, Clive, UT	8086	$5.0 \times 10^{-2}$	$1.0 \times 10^{-2}$	$2.4 \times 10^{-1}$	$1.9 \times 10^{-1}$	$4.4 \times 10^{-1}$	$2.1 \times 10^6$	$5.2 \times 10^{-4}$	$3.0 \times 10^{-5}$	$2.6 \times 10^{-4}$	$1.2 \times 10^{-3}$	$1.1 \times 10^{-4}$			
Solid waste, Hanford, WA	16,362	$9.0 \times 10^{-2}$	$1.3 \times 10^{-2}$	$2.9 \times 10^{-1}$	$3.8 \times 10^{-1}$	$6.8 \times 10^{-1}$	$2.1 \times 10^6$	$4.2 \times 10^{-4}$	$5.4 \times 10^{-5}$	$4.1 \times 10^{-4}$	$1.2 \times 10^{-3}$	$2.3 \times 10^{-4}$			
Solid waste, Oak Ridge, TN	53,573	$3.1 \times 10^{-1}$	$5.6 \times 10^{-2}$	$9.5 \times 10^{-1}$	$1.3 \times 10^0$	$2.3 \times 10^0$	$2.1 \times 10^6$	$2.2 \times 10^{-3}$	$1.9 \times 10^{-4}$	$1.4 \times 10^{-3}$	$5.0 \times 10^{-3}$	$7.6 \times 10^{-4}$			



**Table D-12 Doses and Total Risk of Latent Cancer Fatalities from Accidents during Truck Transportation of Radioactive Materials**

Material	Route	Population Dose (person-rem)					Total Dose	Total Population Risk of LCF
		Ground	Inhaled	Resuspended Soil	Cloud Shine	Total Dose		
Feed	Port Hope, ON	$1.2 \times 10^{-1}$	$1.1 \times 10^1$	$1.8 \times 10^2$	$4.1 \times 10^{-6}$	$1.1 \times 10^1$	$6.6 \times 10^{-3}$	
Feed	Metropolis, IL	$1.2 \times 10^{-1}$	$1.1 \times 10^1$	$1.8 \times 10^2$	$4.2 \times 10^{-6}$	$1.1 \times 10^1$	$6.6 \times 10^{-3}$	
Feed	Baltimore, MD	$1.7 \times 10^{-1}$	$7.8 \times 10^0$	$1.4 \times 10^2$	$6.2 \times 10^{-6}$	$8.0 \times 10^0$	$4.8 \times 10^{-3}$	
Feed	Portsmouth, VA	$1.2 \times 10^{-1}$	$1.1 \times 10^1$	$1.8 \times 10^2$	$4.2 \times 10^{-6}$	$1.1 \times 10^1$	$6.6 \times 10^{-3}$	
Product	Columbia, SC	$1.4 \times 10^{-1}$	$8.3 \times 10^0$	$1.3 \times 10^2$	$2.9 \times 10^{-6}$	$8.5 \times 10^0$	$5.1 \times 10^{-3}$	
Product	Richland, WA	$2.2 \times 10^{-1}$	$1.4 \times 10^0$	$2.2 \times 10^3$	$4.7 \times 10^{-7}$	$1.4 \times 10^0$	$8.4 \times 10^{-4}$	
Product	Wilmington, NC	$1.6 \times 10^{-1}$	$9.5 \times 10^0$	$1.5 \times 10^2$	$3.3 \times 10^{-6}$	$9.6 \times 10^0$	$5.8 \times 10^{-3}$	
Product	Baltimore, MD	$1.6 \times 10^{-1}$	$9.6 \times 10^0$	$1.5 \times 10^2$	$3.3 \times 10^{-6}$	$9.8 \times 10^0$	$5.8 \times 10^{-3}$	
Product	Portsmouth, VA	$1.1 \times 10^{-1}$	$6.4 \times 10^0$	$1.0 \times 10^2$	$2.2 \times 10^{-6}$	$6.5 \times 10^0$	$3.9 \times 10^{-3}$	
Depleted UF <sub>6</sub> /tails	Paducah, KY	$5.7 \times 10^{-2}$	$7.3 \times 10^0$	$1.2 \times 10^2$	$2.8 \times 10^{-6}$	$7.4 \times 10^0$	$4.4 \times 10^{-3}$	
Depleted UF <sub>6</sub> /tails	Portsmouth, OH	$4.1 \times 10^{-2}$	$5.3 \times 10^0$	$8.5 \times 10^3$	$2.0 \times 10^{-6}$	$5.3 \times 10^0$	$3.2 \times 10^{-3}$	
Empty feed	Port Hope, ON	$1.4 \times 10^{-6}$	$2.5 \times 10^{-5}$	$2.1 \times 10^7$	$3.7 \times 10^{-9}$	$2.7 \times 10^5$	$1.6 \times 10^{-8}$	
Empty feed	Metropolis, IL	$1.4 \times 10^{-6}$	$2.6 \times 10^{-5}$	$2.6 \times 10^7$	$3.8 \times 10^{-9}$	$2.8 \times 10^5$	$1.7 \times 10^{-8}$	
Empty feed	Baltimore, MD	$2.1 \times 10^{-6}$	$3.9 \times 10^{-5}$	$3.2 \times 10^7$	$5.7 \times 10^{-9}$	$4.1 \times 10^5$	$2.5 \times 10^{-8}$	
Empty feed	Portsmouth, VA	$1.4 \times 10^{-6}$	$2.6 \times 10^{-5}$	$2.6 \times 10^7$	$3.8 \times 10^{-9}$	$2.8 \times 10^5$	$1.7 \times 10^{-8}$	
Empty product	Columbia, SC	$6.5 \times 10^{-7}$	$1.7 \times 10^{-5}$	$1.4 \times 10^7$	$1.7 \times 10^{-9}$	$1.7 \times 10^5$	$1.0 \times 10^{-8}$	
Empty product	Richland, WA	$1.1 \times 10^{-7}$	$2.7 \times 10^{-6}$	$2.3 \times 10^8$	$2.8 \times 10^{-10}$	$2.8 \times 10^6$	$1.7 \times 10^{-9}$	
Empty product	Wilmington, NC	$7.4 \times 10^{-7}$	$1.9 \times 10^{-5}$	$1.6 \times 10^7$	$1.9 \times 10^{-9}$	$2.0 \times 10^5$	$1.2 \times 10^{-8}$	
Empty DUF <sub>6</sub> /tails	Port Hope, ON	$1.2 \times 10^{-6}$	$2.1 \times 10^{-5}$	$1.8 \times 10^7$	$3.2 \times 10^{-9}$	$2.3 \times 10^5$	$1.4 \times 10^{-8}$	
Empty DUF <sub>6</sub> /tails	Metropolis, IL	$1.2 \times 10^{-6}$	$2.2 \times 10^{-5}$	$1.8 \times 10^7$	$3.3 \times 10^{-9}$	$2.3 \times 10^5$	$1.4 \times 10^{-8}$	
Empty DUF <sub>6</sub> /tails	Baltimore, MD	$2.2 \times 10^{-6}$	$3.9 \times 10^{-5}$	$3.3 \times 10^7$	$5.9 \times 10^{-9}$	$4.2 \times 10^5$	$2.5 \times 10^{-8}$	

**Table D-12 Doses and Total Risk of Latent Cancer Fatalities from Accidents during Truck Transportation of Radioactive Materials (Cont.)**

Material	Route	Population Dose (person-rem)					Total Dose	Total Population Risk of LCF
		Ground	Inhaled	Resuspended Soil	Cloud Shine	Total Dose		
Empty depleted UF <sub>6</sub> /tails	Portsmouth, VA	$1.2 \times 10^{-6}$	$2.2 \times 10^{-5}$	$1.8 \times 10^{-7}$	$3.3 \times 10^{-9}$	$2.3 \times 10^{-5}$	$1.4 \times 10^{-8}$	
Empty depleted UF <sub>6</sub> /tails	Paducah, KY	$1.2 \times 10^{-6}$	$2.2 \times 10^{-5}$	$1.8 \times 10^{-7}$	$3.3 \times 10^{-9}$	$2.3 \times 10^{-5}$	$1.4 \times 10^{-8}$	
Empty depleted UF <sub>6</sub> /tails	Portsmouth, OH	$1.2 \times 10^{-6}$	$2.2 \times 10^{-5}$	$1.8 \times 10^{-7}$	$3.3 \times 10^{-9}$	$2.3 \times 10^{-5}$	$1.4 \times 10^{-8}$	
Solid waste	Clive, UT	$7.3 \times 10^{-6}$	$5.1 \times 10^{-4}$	$4.2 \times 10^{-6}$	$1.9 \times 10^{-10}$	$5.2 \times 10^{-4}$	$3.1 \times 10^{-7}$	
Solid waste	Hanford, WA	$5.9 \times 10^{-6}$	$4.1 \times 10^{-4}$	$3.5 \times 10^{-6}$	$1.6 \times 10^{-10}$	$4.2 \times 10^{-4}$	$2.5 \times 10^{-7}$	
Solid waste	Oak Ridge, TN	$3.1 \times 10^{-5}$	$2.1 \times 10^{-3}$	$1.8 \times 10^{-5}$	$8.1 \times 10^{-10}$	$2.2 \times 10^{-3}$	$1.3 \times 10^{-6}$	

1 **D.5 Uncertainty in Transportation Risk Assessment**  
2

3 There are many sources of uncertainty in assessing the risks of transporting radioactive  
4 materials to and from the proposed EREF. Factors that can be quantified include the routing of  
5 the material, shipping container characteristics, mode of transport, and source or destination of  
6 the material. Each of these sources of uncertainty is discussed below.  
7

8 **D.5.1 Routing of Radioactive Material**  
9

10 There are many varying routes for the shipments of the radioactive materials to and from the  
11 proposed EREF. WebTRAGIS simplifies the routing choices by allowing the analyst to select  
12 various routing restrictions. These can range from no restrictions to HRCQ restrictions.  
13 Choices include the shortest route, fastest route, and prohibit various routes. Based on the  
14 NRC's previous analysis of different routing options (NRC, 2005b), the NRC staff used HRCQ  
15 routing for the transportation impact assessment this EIS.  
16

17 **D.5.2 Shipping Container Characteristics**  
18

19 The characteristics of the shipping container are important in the assessment of both incident-  
20 free and accident impacts. The routine (incident-free) impact is determined by the direct  
21 radiation along the side of the shipping container and the length of the container. The accident  
22 impacts are determined by the release fraction for each accident severity class. Historically,  
23 NUREG-0170 (NRC, 1977) was developed to provide background material for a review by the  
24 NRC of regulations dealing with the transportation of radioactive materials. In 2002, DOE  
25 presented a review of the historical assessments, transportation models, and a compilation of  
26 supporting data parameters, including release fractions, and generally accepted assumptions  
27 (DOE, 2002). DOE also evaluated shipments of depleted UF<sub>6</sub> in Type 48Y containers  
28 (DOE, 1999b); however, the release fractions were about one quarter of the DOE (2002) values.  
29 For this assessment, the NRC staff chose to use the more conservative release fractions for  
30 Type A containers (DOE, 2002).  
31

32 **D.5.3 Source or Destination of Radioactive Material**  
33

34 The source or destination of the radioactive material can also affect the transportation impact  
35 analysis. For example, as discussed in Section D.4, it is not expected that all of the feed  
36 material would be received exclusively from Port Hope, Ontario, Canada, or from Metropolis,  
37 Illinois. It is a reasonable assumption that feed could come from multiple sources. Therefore,  
38 the impact from transportation of feed material would range between the impacts evaluated for  
39 Port Hope and Metropolis. The same rationale applies to other types of shipments.  
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**APPENDIX E**  
**DOSE METHODOLOGY AND IMPACTS**



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## APPENDIX E DOSE METHODOLOGY AND IMPACTS

### E.1 Introduction

This appendix discusses the methodology, data, and results for the analysis of the impacts on workers (construction workers, nonradiological workers, and radiation workers) and members of the general public that could result from routine operations at the AREVA Enrichment Services, LLC (AES) proposed Eagle Rock Enrichment Facility (EREF).

The consideration of radiation impacts on EREF construction workers covers the period of time when the proposed EREF is operational but not yet at full capacity. These workers would be present and could possibly be exposed to radiation during normal operations at the proposed facility. They may be exposed to external gamma radiation from stored depleted uranium cylinders, low-enriched uranium (LEU) product cylinders, natural feed cylinders, and empty cylinders. In addition, these workers would be exposed to radiation associated with the atmospheric release of uranium during normal operations.

The consideration of radiation impacts on EREF radiation workers covers internal exposures that may be associated with uranium enrichment operations, external exposures to depleted uranium and LEU product cylinders, and external exposures associated with process operations. Radiation dosimetry results associated with similar operational facilities will be used to assess worker doses at the proposed EREF.

Radiation impacts on members of the general public may result from the atmospheric release of uranium from normal operations as well as gamma radiation associated with stored depleted uranium cylinders.

### E.2 Pathway Assessment Methodology

The CAP88-PC Version 3.0 computer code was used to assess the impacts on nonradiological workers and members of the general public from the atmospheric release of uranium compounds associated with normal operations (Rosnick, 2007). The CAP88-PC code estimates the total effective dose, which is the 50-year committed effective dose from internal emitters plus the effective dose from external exposure.

#### E.2.1 Members of the General Public

Radiological impacts on members of the general public were estimated for the following:

- collective population living within 80 kilometers (50 miles) of the proposed EREF
- nearest resident
- persons located outside the fenced boundary of the proposed EREF



1 The consideration of radiological impacts on the collective population and nearest resident  
2 covers the following pathways:

- 3
- 4 • external gamma radiation due to plume submersion
- 5
- 6 • external gamma radiation due to deposition
- 7
- 8 • inhalation of uranium compounds due to plume passage
- 9
- 10 • inhalation of uranium compounds due to resuspension
- 11
- 12 • ingestion of plant foods grown within 80 kilometers (50 miles) of the proposed EREF
- 13
- 14 • ingestion of meat products raised within 80 kilometers (50 miles) of the proposed EREF
- 15
- 16 • ingestion of milk produced within 80 kilometers (50 miles) of the proposed EREF
- 17

18 Since the area including and surrounding the proposed EREF is zoned for commercial use, for  
19 assessment purposes, the receptors were modeled as nonradiological workers that spend  
20 2000 hours per year next to the outer boundary of the proposed EREF. The consideration of  
21 radiological impacts on persons working next to the outer fence line of the proposed EREF  
22 covers the following pathways:

- 23
- 24 • external radiation due to stored depleted uranium tail, LEU product, natural feed, and empty  
25 cylinders
- 26
- 27 • external gamma radiation due to plume submersion
- 28
- 29 • external gamma radiation due to deposition
- 30
- 31 • inhalation of uranium compounds due to plume passage
- 32
- 33 • inhalation of uranium compounds due to resuspension
- 34

### 35 **E.2.2 Construction Workers**

36

37 The consideration of radiological impacts on construction workers associated with continued  
38 construction operations while the proposed EREF is operational covers the following pathways:

- 39
- 40 • external radiation due to stored depleted uranium tail, LEU product, natural feed, and empty  
41 cylinders
- 42
- 43 • external gamma radiation due to plume submersion
- 44
- 45 • external gamma radiation due to deposition
- 46
- 47 • inhalation of uranium compounds due to plume passage
- 48

- 1 • inhalation of uranium compounds due to resuspension

2  
3 These receptors were evaluated separately from persons working near the outer boundary  
4 because of their proximity to radiation sources such as the LEU, product, depleted uranium tail,  
5 natural feed, and empty cylinders.  
6

### 7 **E.2.3 Nonradiological Workers**

8  
9 The consideration of radiological impacts on nonradiological workers (i.e., general office staff) is  
10 also considered. These workers are not actively working in the uranium processing areas but  
11 rather are general office staff (administrative/secretarial support, etc.). The potential pathways  
12 would include:  
13

- 14 • external radiation due to stored depleted uranium tail, LEU product, natural feed, and empty  
15 cylinders
- 16
- 17 • external gamma radiation due to plume submersion
- 18
- 19 • external gamma radiation due to deposition
- 20
- 21 • inhalation of uranium compounds due to plume passage
- 22
- 23 • inhalation of uranium compounds due to resuspension
- 24

25 The impacts associated with these workers are assessed using dosimetry records from similar  
26 operating enrichment facilities (AES, 2010).  
27

### 28 **E.2.4 EREF Radiation Workers**

29  
30 Radiological impacts on the EREF radiation workers were estimated on the basis of dosimetry  
31 records of historical operations at similar facilities. The EREF radiation workers would be under  
32 a radiation dosimetry program that measures both external and internal radiation doses.  
33

### 34 **E.2.5 Environmental Transport Methodology**

35  
36 The CAP88-PC Version 3 computer code was used to estimate the radiological impacts  
37 associated with the atmospheric transport of uranium compounds during normal operations  
38 (Rosnick, 2007). CAP88-PC estimates the total effective dose associated with the external  
39 inhalation and ingestion pathways. Version 3 of the computer code has incorporated dose  
40 conversion and risk factors from Federal Guidance Report Number 13 (FGR 13) (EPA, 1999),  
41 which used dose conversion factors from the International Commission on Radiological  
42 Protection Publication 72 (ICRP 72) (ICRP, 1996).  
43

44 The CAP88-PC computer code incorporates a modified version of the AIRDOS-EPA program to  
45 calculate the environmental transport of radionuclides. Relevant sections of the CAP88-PC  
46 Version 3 users guide are reproduced in this section as referenced.  
47

1 At the center of the atmospheric transport model is the Gaussian plume model of Pasquill, as  
 2 modified by Gifford:  
 3

$$4 \quad \chi = \frac{Q}{2\pi\sigma_y\sigma_z\mu} \exp\left[-\frac{1}{2}\left(\frac{y}{\sigma_y}\right)^2\right] \left( \exp\left[-\frac{1}{2}\left(\frac{z-H}{\sigma_z}\right)^2\right] + \exp\left[-\frac{1}{2}\left(\frac{z+H}{\sigma_z}\right)^2\right] \right), \quad (1)$$

5  
 6 where

- 7
- 8  $\chi$  = concentration in air (chi) at x meters downwind, y meters crosswind, and
- 9 z meters above ground (Ci/m<sup>3</sup>)
- 10 Q = release rate from stack (Ci/s)
- 11  $\mu$  = wind speed (m/s)
- 12  $\sigma_y$  = horizontal dispersion coefficient (m)
- 13  $\sigma_z$  = vertical dispersion coefficient (m)
- 14 H = effective stack height (m)
- 15 y = crosswind distance (m)
- 16 z = vertical distance (m)
- 17

18 The effective release height used in equation 1 considers buoyant plume rise due to compounds  
 19 being released above ambient temperatures. For the proposed EREF, any released uranium  
 20 compounds would be at ambient temperatures; therefore, the effective stack height is simply the  
 21 height of the release point.  
 22

23 Annual average meteorological data sets usually include frequencies for several wind-speed  
 24 categories for each wind direction and the Pasquill atmospheric stability category. CAP88-PC  
 25 uses reciprocal-averaged wind speeds in the atmospheric dispersion equations, which permit a  
 26 single calculation for each wind speed category. Equation 1 is applied to ground-level  
 27 concentrations in air at the plume centerline by setting y and z to zero, which results in  
 28

$$29 \quad \chi = \frac{Q}{2\pi\sigma_y\sigma_z\mu} \exp\left[-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2\right]. \quad (2)$$

30  
 31 The average ground-level concentration in air over a sector of 22.5 degrees can be  
 32 approximated by  
 33

$$34 \quad \chi_{avg} = \frac{\int_0^{\infty} \exp\left[-\left(\frac{0.5}{\sigma_y}\right)y^2\right] dy}{x \tan(11.25^\circ)} * \frac{Q}{2\pi\sigma_y\sigma_z\mu} \exp\left[-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2\right], \quad (3)$$

35  
 36 which can be reduced further to  
 37

$$\chi_{avg} = \frac{Q}{0.15871 \pi x \sigma_z \mu} \exp \left[ -\frac{1}{2} \left( \frac{H}{\sigma_z} \right)^2 \right]. \quad (4)$$

The CAP88-PC code considers both dry and wet deposition as well as radioactive decay. Plume depletion is accounted for by substituting a reduced release rate  $Q'$  for the original release rate for each downwind distance  $x$  (Slade, 1968). The ratio of the reduced release rate to the original is the depletion fraction. The overall depletion fraction used in CAP88-PC is the product of the depletion fractions for precipitation, dry deposition, and radioactive decay.

Ground surface soil concentrations are calculated on an annual basis. Ingrowth and decay of progeny radionuclides are calculated by using Bateman's equations for the entire decay chain. Radionuclide concentrations in meat, milk, and vegetables are calculated by using elemental transfer factors from Report 123 of the National Council on Radiation Protection and Measurements (NCRP, 1996). The concentration in soil for each isotope is multiplied by the appropriate elemental transfer factor to generate a concentration in each ingestion pathway medium for that isotope in that sector.

### E.3 Radiological Impact Assessment Input

The data and results of the radiological impacts are provided below for the following groups:

- collective population
- nearest resident
- member of the public adjacent to the outer boundary of the proposed EREF
- construction workers associated with the continued construction operations while the proposed EREF is operational
- construction worker at uranium hexafluoride (UF<sub>6</sub>) cylinder pad
- EREF workers

#### E.3.1 Radionuclide Releases

The release of uranium compounds during normal operations was modeled by using the activity data provided in Table E-1. The radiological impacts were modeled by using releases from a 1.5-million-separative work unit (SWU) plant described in NUREG-1484 (NRC, 1994) linearly scaled up to a 6.6-million-SWU facility. For the 6.6-million-SWU facility, it was assumed that 19.5 megabecquerels (530 microcuries) of uranium was released. For conservatism, this same quantity of uranium was assumed to be released during the combined construction and operational phase in order to estimate the maximum potential dose that construction workers could incur.

Release points for airborne emissions were assumed to take place at an elevation of 40 m (132 ft). However, the CAP88-PC computer code does not account for building wake effects.

**Table E-1 Source Term Used for the Radiological Impact Assessment for Normal Operations<sup>a</sup>**

Radionuclide	Wt%	Activity MBq (μCi)
Uranium-234	$5.5 \times 10^{-3}$	9.5 (260)
Uranium-235	0.71	0.5 (10)
Uranium-238	99.3	9.5 (260)
Total		19.5 (530)

<sup>a</sup> Members of the general public, 6.6-million-SWU facility. Annual uranium released: 760 grams, 19.5 MBq (530 μCi).  
Source: Derived from AES, 2010.

1  
2 Therefore, doses were assessed based on a combination of ground-level releases and 40-m  
3 stack releases. For conservatism, the maximum dose calculated for the same individuals or  
4 collective population from either a 40-m release or a ground-level release was used for the dose  
5 assessment.

6  
7 **E.3.2 Population Distributions**

8  
9 The general population distribution for the radiological impact assessment was made by  
10 projecting the population of the 12 counties in Idaho (Bannock, Bingham, Blaine, Bonneville,  
11 Butte, Caribou, Clark, Fremont, Jefferson, Lemhi, Madison, and Power) that fall within the  
12 80-kilometer (50-mile) radius of the proposed EREF. Population estimates were made by using  
13 the SECPOP 2000 computer code to year 2050 (NRC, 2003). A total of 267,256 persons was  
14 considered for estimating the collective population dose. Table E-2 provides the population  
15 distribution data used for the assessment.

16  
17 The worker population distributions were derived on the basis of those workers who are  
18 involved in the continued build-out of the adjoining Separation Building Modules (SBMs), the  
19 UF<sub>6</sub> handling areas, and the storage areas for the full tails, full feed, and empty cylinders. In  
20 total, approximately 400 construction-related persons were evaluated for the radiological dose  
21 assessment. Table E-3 provides a breakdown of the individuals by labor craft and location.

22  
23 **E.3.3 Exposure Time Fractions and Receptor Locations**

24  
25 The CAP88-PC computer code assumes that an individual spends an entire year at the  
26 locations provided. This assumption is overly conservative with regard to evaluating either the  
27 construction worker collective population dose or the dose received by a hypothetical worker at  
28 the site boundary because, on average, a worker is assumed to spend 2000 hours per year at a  
29 job site. In order to account for this limitation, the collective construction worker doses and the  
30 doses received by a hypothetical worker at the site boundary were scaled down by a factor of  
31 4.38 (24 multiplied by 365.25/2000).



**Table E-2 Extrapolated Data on Population within 80-kilometer (50-mile) Radius of Proposed EREF in 2050**  
 (distance from proposed EREF in kilometers [top line] and miles [bottom line])

<b>Direction</b>	<b>0-1.6 (0-1)</b>	<b>1.6-3.2 (1-2)</b>	<b>3.2-4.8 (2-3)</b>	<b>4.8-6.4 (3-4)</b>	<b>6.4-8.0 (4-5)</b>	<b>8.0-16 (5-10)</b>	<b>16-32 (10-20)</b>	<b>32-48 (20-30)</b>	<b>48-64 (30-40)</b>	<b>64-80 (40-50)</b>
S	0	0	0	0	0	0	169	20,589	3835	61,264
SSW	0	0	0	0	0	0	49	757	1172	3477
SW	0	0	0	0	0	0	49	55	5	38
WSW	0	0	0	0	0	0	0	33	9	6
W	0	0	0	0	0	0	0	0	10	2142
WNW	0	0	0	0	0	0	0	56	220	562
NW	0	0	0	0	0	0	0	0	0	84
NNW	0	0	0	0	0	0	53	299	58	18
N	0	0	0	0	0	0	921	223	146	70
NNE	0	0	0	0	0	0	290	559	157	831
NE	0	0	0	0	0	3	193	8	1365	4882
ENE	0	0	0	0	0	3	1561	9655	29,946	4229
E	0	0	0	0	0	17	1004	13,654	3436	37
ESE	0	0	0	0	0	14	12,744	68,188	421	0
SE	0	0	0	0	0	0	741	10,303	21	2
SSE	0	0	0	0	0	75	142	6214	78	114

**Table E-3 Worker Population Distribution during  
Build-Out/Operational Phase**

<b>Labor Craft</b>	<b>Plant Area</b>	<b>Craft Hours per Year</b>	<b>Persons</b>
Civil/structural	UF <sub>6</sub> Handling	109,174	54
	SBM	269,296	134
	Cylinder Pad	24,729	12
Mechanical	UF <sub>6</sub> Handling	65,504	32
	SBM	161,577	80
	Cylinder Pad	14,837	7
Electrical	UF <sub>6</sub> Handling	43,669	22
	SBM	107,718	53
	Cylinder Pad	9891	5
Totals	UF <sub>6</sub> Handling	218,348	108
	SBM	538,592	267
	Cylinder Pad	49,459	24.5

Source: AES, 2009.

1  
2 The hypothetical site boundary receptor was chosen so that a person would receive the dose;  
3 therefore, this individual can be considered a maximally exposed individual. Since Bonneville  
4 County zoning laws prohibit the land area adjacent to the proposed EREF to be zoned other  
5 than for industrial use, the receptor was modeled as a worker that spends 2000 hours per year  
6 at the proposed site boundary. On the basis of the release point and meteorological conditions  
7 present at the proposed site, the receptor was assumed to be located 1.1 kilometers (0.7 mile)  
8 north of the proposed site.  
9

10 Table E-4 provides a listing of the receptor locations and the time fractions used to estimate the  
11 radiological impacts on the nearest resident and the hypothetical worker at the proposed site  
12 boundary.  
13

### 14 **E.3.4 Agricultural Productivity**

15  
16 The ingestion of vegetables, meat, and milk was considered in the radiological impact  
17 assessment. The U.S. Environmental Protection Agency (EPA) rural food source scenario  
18 option within CAP88-PC was selected for the assessment. On the basis of regional food  
19 production, estimates were derived for the beef cattle density, milk cattle density, and land  
20 fraction cultivated by vegetables. Table E-5 provides a list of the agricultural parameters used  
21 in CAP88-PC for the radiological impact assessment.  
22

### 23 **E.3.5 Radionuclide-Specific Input**

24  
25 The radiological impacts were estimated by using the CAP88-PC Version 3.0 computer code.  
26 This computer code uses the newer FGR-13/ICRP-72-based dose conversion factors. Uranium

**Table E-4 Receptor Locations for Radiological Impact Assessment**

Receptor	Direction from Source to Proposed Site Boundary	Distance from Source to Proposed Site Boundary in km (mi)	Time Spent at Location (h)
Nearest resident	North	8.0 (5.0)	8761
Member of the public at proposed site boundary:			
Cylinder pad	North	0.76 (0.47)	2000
Atmospheric release	North	1.1 (0.7)	NA <sup>a</sup>

<sup>a</sup> NA = Not applicable.

1

**Table E-5 Agricultural Input Parameters Used in the Radiological Impact Assessment**

	Vegetable	Meat	Milk	Scenario
Fraction from assessed area	0.7	0.4	0.442	Collective population dose
Fraction home produced	0.3	0.6	0.558	Nearest resident
Cattle density (no./km <sup>2</sup> )		11	1.78	Collective population/nearest resident
Cultivated land fraction	0.036			Collective population/nearest resident

Source: Derived from AES, 2010.

2

3 compounds released from the proposed EREF were assumed to be in the form of uranyl  
4 fluoride (UO<sub>2</sub>F<sub>2</sub>), which would be more soluble than other forms of uranium, such as uranium  
5 oxide. To properly capture this chemical phenomenon, “medium” lung clearance classes were  
6 assigned to each uranium isotope.

7

8 Radionuclide transfer factors are used to model the uptake of radionuclides by plants and  
9 animals. The transfer factors are element-dependent rather than radionuclide-dependent. The  
10 default values for uranium found in the CAP88-PC Version 3.0 computer code were used for the  
11 radiological impact assessment. A list of the element- and radionuclide-specific factors used for  
12 all radiological impact modeling is provided in Table E-6.

13

#### 14 **E.4 Results of the Radiological Impact Analyses**

15

16 This section provides the results of the radiological impact analyses. Radiological impacts were  
17 estimated for the following:

18

- 19 • collective population
- 20 • nearest resident
- 21 • member of the public adjacent to the outer boundary of the proposed EREF

22

23

24

**Table E-6 Radionuclide-Specific Input Used in the Radiological Impact Assessment**

Parameter Name	Radionuclide			Element
	Uranium-234	Uranium-235	Uranium-238	Uranium
Lung clearance class	M	M	M	
Inhalation dose conversion factor (mrem/pCi)	$1.29 \times 10^{-2}$	$1.14 \times 10^{-2}$	$1.06 \times 10^{-2}$	
Ingestion dose conversion factor (mrem/pCi)	$1.83 \times 10^{-4}$	$1.73 \times 10^{-4}$	$1.65 \times 10^{-4}$	
Immersion dose conversion factor (mrem m <sup>3</sup> /μCi-yr)	$7.14 \times 10^5$	$7.55 \times 10^8$	$2.92 \times 10^5$	
Ground surface dose conversion factor (mrem m <sup>2</sup> /μCi-yr)	$6.82 \times 10^2$	$1.63 \times 10^5$	$4.94 \times 10^2$	
Deposition velocity (m/s)	$1.8 \times 10^{-3}$	$1.8 \times 10^{-3}$	$1.8 \times 10^{-3}$	
Particle size (μm)	1	1	1	
Milk transfer factor				$4 \times 10^{-4}$
Meat transfer factor				$8 \times 10^{-4}$
Forage uptake factor (pCi/kg of dry forage/dry soil)				0.1
Edible update factor (pCi/kg of wet soil/dry soil)				0.02

Source: Rosnick, 2007; EPA, 1999.

- 1
- 2 • construction workers associated with the continued construction operations while the
- 3 proposed EREF is operational
- 4
- 5 • construction worker at uranium hexafluoride (UF<sub>6</sub>) cylinder pad
- 6
- 7 • EREF workers
- 8

#### 9 **E.4.1 Collective Population**

10  
11 Radiological impacts on members of the general population were estimated to be  
12  $1.74 \times 10^{-3}$  person-rem/yr ( $1.74 \times 10^{-5}$  person-Sv/yr). The breakdown by radionuclide follows  
13 below:

- 14
- 15 •  $9.3 \times 10^{-4}$  person-rem/yr (54 percent) uranium-234
- 16
- 17 •  $3.8 \times 10^{-5}$  person-rem/yr (2 percent) uranium-235
- 18
- 19 •  $7.7 \times 10^{-4}$  person-rem/yr (44 percent) uranium-238
- 20

1 The inhalation pathway was the most dominant, accounting for approximately 88 percent of the  
2 total dose. The ingestion pathway contributed to approximately 11 percent of the total dose.  
3

#### 4 **E.4.2 Individual Public Doses**

5  
6 Radiological impacts were evaluated for the nearest resident and a member of the public next to  
7 the proposed EREF site boundary. As shown in Table E-4, the nearest resident is located  
8 8 kilometers (5 miles) to the north of the proposed EREF and is assumed to spend the entire  
9 year at that one location. The dose to this individual was estimated to be  $2.12 \times 10^{-4}$  millirem  
10 per year. The dominant pathway for this dose is inhalation, which makes up almost 94 percent  
11 of the total dose.  
12

13 Radiological impacts on the hypothetical member of the public next to the proposed site  
14 boundary would be composed of both an external dose due to the stored UF<sub>6</sub> cylinders and an  
15 inhalation dose due to the release of uranium under normal operations. The total annual dose  
16 to this individual was estimated at 1.4 millirem per year; the external dose associated with the  
17 stored cylinders would account for more than 99.86 percent of the total. Since the vast majority  
18 of the dose is from external radiation associated with the UF<sub>6</sub> cylinders, it is more appropriate to  
19 compare this dose to the dose associated with the regulations found in Title 10 of the U.S. *Code*  
20 *of Federal Regulations* (10 CFR 20.1301). In comparison, this dose to the member of the public  
21 at the site boundary is more than 70 times lower than the 100-mrem/yr dose limit for members  
22 of the public as codified in 10 CFR 20.1301.  
23

#### 24 **E.4.3 Worker Doses**

25  
26 Radiological impacts on construction workers were evaluated for the period when the proposed  
27 EREF would be operational but construction would continue on the SBM and the Cylinder  
28 Storage Pad. For this assessment, it was assumed that the cylinder pad would be constructed  
29 in 20-percent increments. For conservatism, radiological impacts were evaluated for the time  
30 when the last of the segments would be constructed. This scenario would yield the largest  
31 external dose to the workers because of the quantity of cylinders on the pad. The impacts  
32 would be dominated by the external dose associated with stored UF<sub>6</sub> cylinders on the pad. The  
33 MCNP Version 5 computer code was used to estimate doses when the last 20 percent of the  
34 pad would be under construction (X5 Monte Carlo Team, 2003).  
35

36 The total annual collective worker dose to construction workers associated with continued  
37 construction of the remainder of the proposed EREF while a portion of the proposed facility is  
38 under construction was estimated to be 37.6 person-rem. More than 99 percent of the total  
39 dose is associated with external exposures from the depleted uranium, LEU product, natural  
40 feed, and empty cylinders. Likewise, approximately 64 percent of the collective worker dose is  
41 associated with the workers constructing the storage pad. Table E-7 provides the collective  
42 doses for both members of the general public living within 80 kilometers (50 miles) of the  
43 proposed EREF and the construction workers associated with the build-out of the existing  
44 facility.  
45

46 The radiological impact on a construction worker completing the last section of the UF<sub>6</sub> storage  
47 pad was estimated at 196 millirem per year, with essentially the entire dose attributable to the  
48 depleted uranium, LEU product, natural feed, and empty cylinders on the storage pad. This



**Table E-7 Collective Doses for Members of the General Public and Construction Workers during Proposed EREF Build-Out**

Receptor	Collective Dose (person-rem/yr)	% Attributable to Cylinders on Pad
General public	$1.74 \times 10^{-3}$	~0
Construction workers:		
SBM and UF <sub>6</sub> handling area	13.6	99.99
Storage pad	24.0	99.99
Total	37.6	99.99

1

**Table E-8 Summary of Individual Doses for Workers and Members of the Public**

Receptor	Dose (mrem/yr)	Major Pathway
Nearest receptor	$2.12 \times 10^{-4}$	Inhalation
Hypothetical member of the public at the proposed site boundary	1.4	External
Construction pad worker	196 <sup>a</sup>	External

<sup>a</sup> This dose exceeds the dose limit in 10 CFR 20.1301 by a factor of 1.96. The construction pad workers should therefore be part of a radiation dosimetry program and reclassified as radiation workers.

2

3 dose is almost two times the annual dose limit to members of the general public; therefore,  
 4 these workers should be part of a radiation dosimetry program and classified as radiation  
 5 workers. Table E-8 provides a summary of the individual doses evaluated in the radiological  
 6 impact assessment.

7

8 Annual whole-body dose equivalents accrued by workers at an operating uranium enrichment  
 9 plant are typically low; they ranged from 0.22 to 0.44 millisievert in URENCO (2003, 2004, 2005,  
 10 2006, 2007). In general, annual doses to workers are expected to range from 0.50 millisievert  
 11 per year (5 millirem per year) for general office staff to 3 millisieverts per year (300 millirem per  
 12 year) for cylinder handlers. The proposed EREF has proposed an administrative limit of  
 13 0.01 sievert per year (1 rem per year) to any radiation worker. This limit is 20 percent of the  
 14 regulatory limit provided in 10 CFR 20.1201. Table E-9 provides estimates of annual doses to  
 15 representative workers within the proposed EREF. Table E-10 provides estimated dose rates at  
 16 several areas at the proposed EREF.

17

**Table E-9 Estimated Annual Exposures for Various Occupations at the Proposed EREF**

Position	Annual Dose Equivalent (mrem)
General office staff (nonradiological workers)	<5.0
Typical operations and maintenance technician	100
Typical cylinder handler	300

Source: AES, 2010.

1

**Table E-10 Estimated Dose Rates at Various Locations within the Proposed EREF**

Position	Dose Rate (mrem/h)
Plant general area	0.01
Separation building – Cascade Halls	0.05
Separation building	0.1
Empty used UF <sub>6</sub> shipping cylinder	
On contact	10
At 1 meter (3.3 feet)	1
Full UF <sub>6</sub> shipping cylinder	
On contact	5
At 1 meter (3.3 feet)	0.2

Source: AES, 2010.

2

3 **E.5 References**

4

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**APPENDIX F**  
**SOCIOECONOMIC ANALYSIS METHODS**





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## APPENDIX F SOCIOECONOMIC ANALYSIS METHODS

This appendix describes the methods used to estimate the socioeconomic impacts of preconstruction and construction activities and facility operations of the proposed Eagle Rock Enrichment Facility (EREF). Impacts are evaluated for a two-county region of influence (ROI) consisting of Bingham and Bonneville Counties, Idaho. The ROI is the area in which the majority of the proposed EREF permanent employees would live and spend their wages and which is expected to be the primary source of labor for each phase of the proposed EREF (AES, 2010).

The socioeconomic analysis was divided into four main steps: (1) expenditure and employment data during construction and operations were used to estimate direct and indirect economic impacts; (2) the impact on direct State and local tax revenues were estimated; (3) the number of in-migrating workers required to fill onsite job positions during each project phase, and associated family members, was estimated based on information gathered from local economic development agencies; and (4) the resulting housing and local community service employment impacts were estimated.

### **F.1 Employment, Income, and Tax Impacts**

Employment and income impacts include both direct and indirect employment and income associated with the various phases of the proposed EREF development. Direct employment and income are created by onsite activities at the facility itself, while indirect employment and income are created in the ROI as workers directly employed by the proposed EREF spend their salaries and as jobs are created with the purchase of materials, equipment, services, and other non-payroll expenditures. Direct employment and income created during each stage of the proposed project were estimated on the basis of anticipated labor inputs and salaries for the various engineering and construction activities associated with each phase of the proposed project. The indirect impacts of the proposed EREF on regional employment and income were estimated using regional economic multipliers. Multipliers capture the indirect (offsite) effects of onsite activities associated with construction and operation.

The multipliers used in this analysis were taken from the RIMS-II Input-Output Model developed by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA, 2010). The multipliers take into account the flow of commodities to industries from producers and institutional consumers in the various sectors of the economy of the ROI. Input-output accounts also show consumption activities by workers, owners of capital, and imports from outside the region. The RIMS II model contains 528 sectors representing the industries of agriculture, mining, construction, manufacturing, wholesale and retail trade, utilities, finance, insurance and real estate, and consumer and business services. For each sector, the model also includes information on employee compensation; proprietary and property income; personal consumption expenditures; Federal, State, and local expenditures; inventory and capital formation; and imports and exports.

The RIMS-II multipliers measure the total (direct plus indirect) impact of direct facility employment on ROI output, income, and employment. Multipliers associated with each major expenditure category (for example, separator equipment, process building and offices, utilities,

1 spare parts, and construction payroll) taken from the RIMS-II model are multiplied by the  
2 relevant direct employment number, with the resulting total impacts in each category  
3 aggregated to produce the overall impact of each phase of the proposed facility.  
4

5 State income tax revenue impacts were estimated by applying State income tax rates to  
6 projected EREF project-related construction and operations earnings. State and local sales tax  
7 revenues were estimated by applying appropriate State and local sales tax rates (see  
8 Section 3.12.4) to after-tax income generated by construction and operations employees that  
9 was spent within the ROI.

## 10 11 **F.2 Impacts on Population**

12  
13 A number of workers, families, and children would migrate into the ROI, either temporarily or  
14 permanently, with construction and operation of the proposed EREF. The capacity of regional  
15 labor markets to provide sufficient numbers of workers in the appropriate occupations required  
16 for facility construction and operation is closely related to the occupational profile of the ROI and  
17 its occupational unemployment rates. Although Bingham and Bonneville Counties are expected  
18 to be the primary sources of labor for the proposed EREF, some in-migration of workers,  
19 families, and children into the ROI, either temporarily or permanently, is expected during each  
20 phase of the proposed EREF. The capacity of regional labor markets to produce sufficient  
21 numbers of workers in the appropriate occupations required for facility construction and  
22 operation is closely related to the occupational profile of the ROI and occupational  
23 unemployment rates. The number of in-migrating workers used in the analysis was assumed to  
24 be small, with the majority of craft skills being available in the ROI. Sixty-five percent of  
25 in-migrating workers were assumed to be accompanied by their families, which would consist of  
26 an additional adult and one school-age child (AES, 2010), based on the national average  
27 household size (U.S. Census Bureau, 2009).  
28

## 29 **F.3 Impacts on Local Housing Markets**

30  
31 The in-migration of workers during preconstruction, construction, and operation would have the  
32 potential to substantially affect the housing market in the ROI. The analysis evaluated the  
33 potential impacts resulting from the in-migration of both direct and indirect workers into the ROI  
34 by estimating the increase in demand for rental housing, the type of housing most likely to be  
35 occupied by construction workers, in the peak year of construction, and the increase in demand  
36 for owner-occupied housing, the housing type most likely to be chosen by operations workers, in  
37 the first year of operation. The relative impact on existing housing in the ROI was estimated by  
38 calculating the impact of the proposed EREF-related housing demand on the forecasted number  
39 of vacant rental housing units in the peak year of construction and the number of vacant owner-  
40 occupied units in the first year of operations using data from the U.S. Census Bureau  
41 (U.S. Census Bureau, 2009).  
42

## 43 **F.4 Impacts on Community Services**

44  
45 Impacts of proposed EREF in-migration on community service employment were estimated for  
46 the two ROI counties in which most of the new workers would reside. The projected numbers of  
47 in-migrating workers and families were used to calculate the numbers of new sworn police  
48 officers, firefighters, and general government employees required to maintain the existing levels

1 of service for each community service. Calculations were based on the existing number of  
2 employees per 1000 population for each community service. The analysis of the impacts on  
3 educational employment estimated the number of teachers required for each school district to  
4 maintain existing teacher–student ratios across all student age groups. Information on existing  
5 employment and levels of service was collected from the individual jurisdictions providing each  
6 service.

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## 8 **F.5 References**

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10 (AES, 2010) AREVA Enrichment Services, LLC. “Eagle Rock Enrichment Facility  
11 Environmental Report, Rev. 2.” Bethesda, Maryland. April.

12

13 (BEA, 2010) Bureau of Economic Analysis. “Regional Economic Accounts: RIMS II Multipliers.”  
14 <<https://www.bea.gov/regional/rims/rimsii/>> (Accessed April 19, 2010).

15

16 (U.S. Census Bureau, 2009) U.S. Census Bureau. “American Fact Finder.”  
17 <<http://factfinder.census.gov/>> (Accessed October 4, 2009).



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**APPENDIX G**  
**ENVIRONMENTAL JUSTICE ANALYSIS DATA**





**APPENDIX G  
ENVIRONMENTAL JUSTICE ANALYSIS DATA**

This appendix provides the data used in the assessment of the potential for disproportionately high and adverse human health or environmental effects on minority and/or low-income populations resulting from the preconstruction, construction, operation, and decommissioning of the proposed Eagle Rock Enrichment Facility (EREF).

Tables G-1 through G-4 present detailed Census data for the environmental justice analysis at the State, county, and Census block group levels for 2000 (U.S. Census Bureau, 2010). Minority and low-income populations are defined in Sections 3.13.1 and 3.13.2 of this Environmental Impact Statement (EIS). ArcView® geographic information system software was used to determine minority and low-income characteristics by block group. Minority and low-income data are shown for all block groups that lay partially or completely within the area 6.4 kilometers (4 miles) from the proposed EREF.

**Table G-1 State and County Minority Population Totals, 2000**

Location	Total Population	Minority Population	Percent Minority
Idaho	1,293,953	116,649	9.0
Bingham County	41,735	7332	17.6
Bonneville County	82,522	5948	7.2
Jefferson County	19,155	1749	9.1

Source: U.S. Census Bureau, 2010.

**Table G-2 Census Block Group Minority Population Totals, 2000**

Location	County	Total Population	Minority Population	Percent Minority
Census Tract 9503, Census Block Group 1	Bingham	1438	234	16.3
Census Tract 9715, Census Block Group 1	Bonneville	790	170	21.5
Census Tract 9715, Census Block Group 2	Bonneville	987	74	7.5
Census Tract 9601, Census Block Group 1	Jefferson	957	202	21.1

Source: U.S. Census Bureau, 2010.

**Table G-3 State and County Low-Income  
Population Totals, 1999**

Location	Total Population <sup>a</sup>	Low-Income Population	Percent Minority
Idaho	1,263,205	148,732	11.8
Bingham County	41,342	5137	12.4
Bonneville County	81,532	8260	10.1
Jefferson County	19,155	1984	10.4

<sup>a</sup> Total population for which poverty status has been determined.

Source: U.S. Census Bureau, 2010.

1

**Table G-4 Census Block Group Low-Income Population Totals, 1999**

Location	County	Total Population <sup>a</sup>	Low-Income Population	Percent Low-Income
Census Tract 9503, Census Block Group 1	Bingham	1384	162	11.7
Census Tract 9715, Census Block Group 1	Bonneville	692	109	15.8
Census Tract 9715, Census Block Group 2	Bonneville	1053	69	6.6
Census Tract 9601, Census Block Group 1	Jefferson	957	223	23.3

<sup>a</sup> Total population for which poverty status has been determined.

Source: U.S. Census Bureau, 2010.

2

3 **G.1 References**

4

5 (CEQ, 1997) Council on Environmental Quality. "Environmental Justice: Guidance under the  
6 National Environmental Policy Act." December 10.

7

8 (U.S. Census Bureau, 2010) U.S. Census Bureau. "American Fact Finder."

9 <<http://factfinder.census.gov>> (Accessed March 17, 2010).

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**APPENDIX H**  
**BENEFIT-COST ANALYSIS OF PROPRIETARY DATA**

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**The text in this appendix is being withheld under 10 CFR 2.390.**



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**APPENDIX I  
PUBLIC PARTICIPATION AND  
NRC RESPONSE TO COMMENTS  
ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT**



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**APPENDIX I  
PUBLIC PARTICIPATION AND  
NRC RESPONSE TO COMMENTS  
ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT**

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**I.1 Introduction**

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This appendix summarizes the public participation process conducted by the U.S. Nuclear Regulatory Commission (NRC) staff for the environmental review and preparation of the Environmental Impact Statement (EIS) in support of the NRC's decision on issuing a license to AREVA Enrichment Services LLC (AES) to construct, operate, and decommission a proposed uranium enrichment facility. This facility is the proposed Eagle Rock Enrichment Facility (EREF) near Idaho Falls in Bonneville County, Idaho. In particular, this appendix also presents all of the comments received by the NRC on the Draft EIS and the staff's response to those comments. The NRC staff has considered and addressed the approximately 1150 individual comments that were received from approximately 220 government officials and agencies, nongovernmental organizations, and members of the general public.

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**I.2 Public Participation**

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Public participation is an essential part of the environmental review process under the *National Environmental Policy Act of 1969*, as amended (NEPA). This section discusses the process for public participation during the NRC staff's development of the EIS for the proposed EREF. As indicated in the discussions below, the NRC conducted an open, public EIS development process consistent with NEPA and the NRC's regulations under Title 10 of the U.S. *Code of Federal Regulations* (10 CFR) Part 51.

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**I.2.1 Initial Notification and Notice of Formal Proceeding**

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Upon receipt of AES's license application for the proposed EREF and completion of an initial acceptance review, the NRC published a notice in the *Federal Register* on July 30, 2009 (74 FR 38052) of receipt and availability of the application and notice of hearing. The NRC's environmental review began following acceptance and docketing of the application, which included a Safety Analysis Report and an Environmental Report. The NRC conducted its reviews pursuant to the requirements of 10 CFR 70.65 and 10 CFR 51.60, respectively.

**I.2.2 Public Scoping**

The NRC is required under 10 CFR 51.20(b)(10) to prepare an EIS, and under 10 CFR 51.26 to issue a Notice of Intent (NOI) to prepare the EIS and conduct a scoping process for the EIS. The NRC's public scoping process for the EIS for the proposed EREF began on May 4, 2009, with the publication in the *Federal Register* of the NOI (74 FR 20508). This NOI established a 45-day scoping period, ending on June 19, 2009, during which the public could submit written comments on the appropriate scope of issues to be considered in the EIS. The NOI also provided a brief description of the proposed EREF project and information on alternatives to be evaluated and environmental impact areas to be analyzed in the EIS; summarized the NEPA process for the proposed project; identified where information on the proposed project could be accessed; announced a public scoping meeting to be held in Idaho Falls, Idaho, during the



1 scoping period, on June 4, 2009; and provided information on how to submit written comments  
2 to the NRC.

3  
4 At the public scoping meeting, the NRC staff provided a description of the NRC's role,  
5 responsibilities, and mission; gave a brief overview of its environmental and safety review  
6 processes; discussed how the public could effectively participate in the environmental review  
7 process; and solicited comments from the public on environmental issues and concerns related  
8 to the proposed project. Approximately 40 individuals provided oral comments at the meeting.  
9 In addition, seven individuals provided written comments via regular postal mail and another  
10 95 individuals provided comments via email during the scoping period. Scoping comments  
11 were provided by government officials and agencies, nongovernmental organizations, and the  
12 general public.

13  
14 The oral and written scoping comments received by the NRC were summarized by the staff in  
15 the *Scoping Summary Report*, issued on September 11, 2009. This report, which is included in  
16 this EIS in Appendix A, also contains additional information on the scoping process and  
17 identifies the issues that would be addressed in the EIS based on the public scoping comments.  
18

### 19 **I.2.3 Draft EIS Development and Availability for Public Comment**

20  
21 Once the NRC staff completed the scoping process, defined the proposed action and  
22 alternatives, and determined the scope of the EIS, the staff prepared the Draft EIS. During  
23 development of the Draft EIS, the NRC staff sought input from a number of sources, including  
24 Federal, State and local government agencies, Tribal governments, and individuals.

25  
26 Pursuant to 10 CFR 51.74, on July 21, 2010, the NRC staff published a Notice of Availability  
27 (NOA) for the Draft EIS in the *Federal Register* (75 FR 42466), announcing the issuance of the  
28 Draft EIS for public comment, in accordance with 10 CFR 51.73, 51.74, and 51.117. The NOA  
29 contained a summary of the contents and preliminary findings of the Draft EIS; the NRC staff's  
30 preliminary recommendation regarding issuance of the proposed license to AES; information on  
31 the public comment meeting to be held in Idaho Falls, Idaho; information on how to submit  
32 written comments at the public comment meeting, electronically, or by mail; and information on  
33 how to access the Draft EIS and other documents related to the proposed EREF project.  
34 Additionally, pursuant to 10 CFR 51.74, the NRC distributed the Draft EIS to approximately  
35 135 individuals including Federal, Tribal, State, and local government officials and other  
36 interested parties. Copies of the Draft EIS were also sent by the NRC staff to a public library in  
37 Idaho Falls, to maintain in an information repository on the environmental review for the  
38 proposed EREF project.

39  
40 Also in the July 21, 2010, *Federal Register* notice, the NRC staff established a 45-day public  
41 comment period on the Draft EIS, consistent with the cited NRC regulations. The official public  
42 comment period began with publication in the *Federal Register* on July 23, 2010, of the Notice  
43 of Availability of the Draft EIS (75 FR 43160). The public comment period ended on September  
44 13, 2010.

45  
46 Pursuant to 10 CFR 51.74, the NRC distributed the Draft EIS to approximately 135 individuals,  
47 including Federal, Tribal, State, and local government officials and other interested parties.  
48 Copies of the Draft EIS were also sent by the NRC staff to the Idaho Falls Public Library. The  
49 staff had sent other information on the project to this library over the course of Draft EIS  
50 development, including the AES Environmental Report and revisions (AES, 2010a). At the

1 request of the NRC staff, the library maintains an information repository on the proposed EREF  
2 project.

#### 3 4 **I.2.4 Draft EIS Public Comment Meetings**

5  
6 The NRC staff conducted public meetings to receive oral and written comments on the Draft EIS  
7 from members of the public. These meetings were held on August 9, 2010, in Boise, Idaho, and  
8 on August 12, 2010, in Idaho Falls, Idaho. At these meetings, the NRC staff provided a  
9 description of the NRC's role, responsibilities, and mission; gave a brief overview of its licensing  
10 and environmental review processes; summarized the content and preliminary findings and  
11 recommendations of the Draft EIS; provided information on how the Draft EIS could be  
12 accessed or obtained and how to provide comments on the document; and solicited comments  
13 from the public on the Draft EIS. Oral comments were provided by 50 individuals during the  
14 Boise meeting and by 46 individuals during the Idaho Falls meeting. In addition, written  
15 comments were provided to the NRC staff by 12 individuals at the Boise meeting and by  
16 19 individuals at the Idaho Falls meeting. Court reporters recorded both meetings and prepared  
17 a written transcript for each.

#### 18 19 **I.2.5 Additional Public Comments Received on the Draft EIS**

20  
21 In addition to the written comments submitted at the two public meetings, the NRC received  
22 7 letters, 43 postcards, and 81 emails containing comments on the Draft EIS during the Draft  
23 EIS public comment period.

### 24 25 **I.3 Draft EIS Public Comment Compilation, Identification, Organization, Review, and** 26 **Response**

#### 27 28 **I.3.1 Comment Compilation**

29  
30 The NRC staff made the public comment meeting transcripts part of the public record, contained  
31 in the NRC's Agencywide Documents Access and Management System (ADAMS). The  
32 meeting transcripts are also available in the NRC's public website for the proposed EREF  
33 project, at <http://www.nrc.gov/materials/fuel-cycle-fac/arevanc.html#3>. Other comment  
34 documents were added to ADAMS as they were received by the NRC.

35  
36 Members of the public can access ADAMS at <http://www.nrc.gov/reading-rm/adams.html>. From  
37 this website, the transcripts and other comment documents can be accessed by entering their  
38 ADAMS Accession Numbers (or ML numbers). The ADAMS Accession Numbers for the  
39 comment documents in which commenter's comments appear are identified in Table I-1.  
40 See Section I.3.2 below for a complete description of the contents of Table I-1.

#### 41 42 **I.3.2 Commenter and Comment Identification**

43  
44 The NRC staff reviewed the public meeting transcripts, letters, postcards, and emails to identify  
45 and extract the individual comments on the Draft EIS from these documents. These comments  
46 are presented in Section I.5 of this appendix.

47  
48 The NRC staff identified commenters from the meeting transcripts and comments submitted in  
49 writing and assigned a unique identification number to each commenter, to aid the readers of

1 this appendix in locating comments submitted by individual commenters and the NRC staff's  
2 corresponding responses to those comments. Table I-1 below lists all of the commenters on the  
3 Draft EIS alphabetically by last name, their associated commenter number, the ADAMS  
4 Accession Number(s) of the comment document(s) in which each commenter's comments  
5 appear, and the subsection(s) of Section I.5 that contain their comments and the NRC  
6 responses to those comments.

7  
8 The NRC staff also assigned a unique comment number to each individual comment. The  
9 public meeting transcripts contain multiple comments, and each written comment document  
10 received contains one or more comments. The comment identification numbers consist of two  
11 parts. The first part identifies the commenter (i.e., is the commenter identification number  
12 discussed above). The second part identifies the specific comment within one of the transcripts  
13 or submitted written comment documents, incrementing sequentially through each transcript  
14 and document.

### 16 **I.3.3 NRC Comment Organization, Review, and Response**

17  
18 From the meeting transcripts and other comment documents, the NRC staff has reviewed,  
19 considered, and addressed the approximately 1150 individual comments that were received.  
20 Comments relating to similar issues and topics have been grouped together, as permitted by  
21 NRC regulations in 10 CFR 51.91. This grouping is also consistent with the Council on  
22 Environmental Quality's NEPA regulations at 40 CFR 1503.4(b).

23  
24 Section I.5 presents all of the comments received, including groups of similar comments, along  
25 with the NRC staff's corresponding responses to these comments or groups of similar  
26 comments. The NRC staff has categorized comments in subsections of Section I.5 according to  
27 their relation to chapters and sections of this EIS and other issues. Section I.5 contains  
28 29 subsections, or topics, under which the public comments have been categorized. Within  
29 these subsections, the comments are further categorized, or grouped, by subtopics that the  
30 comments have in common, and there are one or more such groupings of comments within  
31 each Section I.5 subsection.

32  
33 Each comment or group of similar comments in Section I.5 is introduced with a brief summary  
34 by the NRC staff of the subject of the comment or comments. The text of the comment(s) is  
35 then presented, preceded by the comment identification number(s) and commenter name(s).  
36 This is then followed by the NRC response. For cases in which comments have resulted in a  
37 modification to the Draft EIS, those changes are noted in the staff's response and are included  
38 in this Final EIS. In cases for which the comments do not call for a detailed response, the NRC  
39 staff explains why no further response is necessary.

### 41 **I.3.4 Major Comment Issues and Topics**

42  
43 The majority of the comments received specifically address the scope of the environmental  
44 review, analysis, and issues contained in the Draft EIS, including the NEPA process, purpose  
45 and need, alternatives to the proposed action, existing conditions, potential environmental  
46 impacts, proposed mitigation, environmental measurements and monitoring, and benefit-cost  
47 analysis. However, other comments address topics and issues that were not part of the NEPA  
48 review process for the proposed action. Those comments include questions about the NRC's  
49 safety evaluation of the proposed EREF, security concerns, general statements of support of, or

1 opposition to, the proposed EREF project, and observations regarding past AES activities  
2 (e.g., environmental and safety practices, financial activities) outside the United States.  
3

### 4 **I.3.5 Comments on Out-of-Scope Issues and Topics**

5  
6 The scope of the EIS analysis is defined in 10 CFR 51.71(c), NUREG-1748, “Environmental  
7 Review Guidance for Licensing Actions Associated with NMSS Programs” (NRC, 2003), and the  
8 *Scoping Summary Report* in Appendix A of this EIS. Several commenters raised issues that are  
9 not related to – i.e., not within the scope of – the NRC staff’s environmental review of AES’s  
10 application to construct, operate, and decommission the proposed EREF. These include the  
11 comments regarding general opposition to, and support for, the proposed project, without  
12 reference to EIS content, presented in Sections I.5.1 and I.5.2, respectively. Most of the other  
13 comments on out-of scope issues and topics are identified in Section I.5.5 (Scope of the  
14 Analysis). Because these comments do not directly relate to the content of the Draft EIS and  
15 are outside the scope of the NEPA review of the proposed EREF, the NRC staff did not prepare  
16 detailed responses to these comments.  
17

### 18 **I.4 Mandatory Hearing**

19  
20 By law, a license to construct, operate, and decommission the proposed EREF cannot be  
21 issued until completion of a hearing before the NRC’s Atomic Safety and Licensing Board Panel  
22 (ASLBP). The ASLBP is an adjudicatory body independent from the NRC staff. Among its  
23 responsibilities, the ASLBP appoints judges to preside over NRC licensing cases in which a  
24 hearing request has been submitted, or where a hearing is required under the *Atomic Energy*  
25 *Act* of 1954 (AEA). Although the NRC did not receive any hearing request in connection with  
26 the EREF application, the AEA requires a hearing with regard to the licensing of the  
27 construction and operation of a uranium enrichment facility such as the proposed EREF. On  
28 March 26, 2010, the Chief Judge of the ASLBP established a three-judge Board to preside over  
29 this mandatory hearing. The purpose of the mandatory hearing is twofold: the Board must  
30 determine whether the EREF application meets applicable safety requirements in NRC  
31 regulations, and it must also determine whether the requirements of NEPA and the NRC’s  
32 NEPA-implementing regulations have been satisfied.  
33

34 On May 19, 2010, the ASLBP provided notice in the *Federal Register* of its adoption of a  
35 bifurcated schedule for the mandatory hearing, such that separate safety and environmental  
36 evidentiary hearings would be conducted. The safety hearing would be held first after issuance  
37 of the staff’s Final Safety Evaluation Report (SER). The environmental hearing would be held  
38 later, following issuance of the Final EIS. The SER, NUREG-1951 (NRC, 2010b), was issued in  
39 September 2010, and the safety hearing was held January 25, 2011. Following completion of  
40 the safety and environmental hearings, the ASLBP will issue written findings on whether the  
41 requested license should be issued to AES. The Board’s findings will be subject to review by  
42 the Commission. Evidence submitted during the hearings and January 25th only decisions of  
43 the ASLBP and Commission are made publically available, except to the extent that they  
44 contain proprietary or sensitive security information. This evidence, along with all adjudicatory  
45 issuances and submittals, may be viewed by accessing the Electronic Hearing Docket  
46 maintained by the NRC’s Office of the Secretary at <http://ehd1.nrc.gov/EHD/>.  
47

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Aarti, Reham	Member of the Public	001	ML102310563	I.5.1, I.5.4
Allgood, Lane	Partnership for Science and Technology	002	ML102310563	I.5.3
Anderson, Philip A	Idaho Academy of Science	003	ML102530073	I.5.2
Anonymous	Member of the Public	004	ML102390243	I.5.21
Anonymous	Member of the Public	005	ML102280389	I.5.2
Anonymous	Member of the Public	006	ML102280389	I.5.2, I.5.18
Ayers, Arnold	Member of the Public	007	ML102320123	I.5.2, I.5.13, I.5.16, I.5.18
Bacheider, Carol	Member of the Public	008	ML102310563 ML102320123	I.5.1, I.5.5, I.5.13, I.5.19, I.5.22
Barclay, Steve	Member of the Public	009	ML102650572	I.5.1, I.5.4
Barracough, Jack	Member of the Public	010	ML102320123	I.5.2, I.5.13
Baxter, Donald E	Member of the Public	011	ML102390284	I.5.3
Berndt, Janice	Member of the Public	012	ML102580064	I.5.18
Blackburn, Kit	Member of the Public	013	ML102650572	I.5.1, I.5.8
Blair, William	Member of the Public	014	ML102580071	I.5.1, I.5.4, I.5.12, I.5.13, I.5.18
Bond, Dina	Member of the Public	199	ML102630195	I.5.1, I.5.6
Brailsford, Beatrice	Snake River Alliance	015	ML102320123 ML102580089	I.5.1, I.5.4, I.5.5, I.5.6, I.5.8, I.5.13, I.5.14, I.5.18, I.5.21, I.5.22, I.5.23, I.5.25



**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Briggs, E. Manley	Member of the Public	016	ML102310563 ML102280275	I.5.12, I.5.17
Briggs, Sally	Member of the Public	017	ML102310563 ML102280511	I.5.1, I.5.13
Brown, Deb	Member of the Public	018	ML102650572	I.5.1, I.5.5
Buehler, George	Member of the Public	019	ML102580063	I.5.1, I.5.13, I.5.18
Busby, Tracey	Member of the Public	020	ML102390250	I.5.13
Campbell, Sean	Member of the Public	200	ML102630195	I.5.1, I.5.6
Campos, Giovanna	Member of the Public	201	ML102630195	I.5.1, I.5.6
Cannarozzo, Linda	Member of the Public	021	ML102650572	I.5.1, I.5.4
Carroll, Judy	Member of the Public	022	ML102530077	I.5.1, I.5.18
Casper, Rebecca	Member of the Public	023	ML102320123	I.5.2, I.5.13
Chalfant, Jana	Idaho Economic Development Association	024	ML102280389	I.5.2, I.5.3
Chew, Sue	Idaho State Representative, Boise District 17	025	ML102310563 ML102580070	I.5.1, I.5.4, I.5.5, I.5.13, I.5.16, I.5.28
Chiles, Robb	Greater Idaho Falls Chamber of Commerce	026	ML102310563 ML102320123	I.5.3, I.5.19
Cohn, Sara	Idaho Conservation League	027	ML102310563 ML102530075	I.5.3, I.5.5, I.5.9, I.5.11, I.5.13, I.5.14, I.5.16, I.5.17, I.5.18, I.5.21, I.5.25, I.5.27
Coney, David	Member of the Public	028	ML102310563	I.5.1, I.5.16

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Conner, Richard	Member of the Public	029	ML102650572	I.5.1, I.5.6
Cooke, Kerry	Member of the Public	030	ML102310563 ML102280511	I.5.4, I.5.5, I.5.13, I.5.18
Cooper, James	Member of the Public	031	ML102530074	I.5.1, I.5.4
Cottrell, Cindy	Member of the Public	032	ML102370760	I.5.1, I.5.4, I.5.5, I.5.13, I.5.17, I.5.18, I.5.19
Crapo, Mike	U.S. Senator – Idaho	033	ML102320123	I.5.2, I.5.3, I.5.4
Crockett, Greg <sup>a</sup>	Partnership for Science and Technology	034	ML102320123 ML102280389	I.5.2, I.5.3, I.5.4, I.5.19
Crowley, Stephen	Member of the Public	035	ML102310563 ML102580072	I.5.1, I.5.5
Cutler, Christina	The Shoshone-Bannock Tribes	036	ML102580061	I.5.8, I.5.9, I.5.13, I.5.14, I.5.17, I.5.18, I.5.21
Daly, Kathy	Member of the Public	037	ML102580056	I.5.1
Davidson, Brian	Member of the Public	038	ML102390248	I.5.2, I.5.19
Davis, Kreg	Electrical Wholesale Supply	039	ML102310563 ML103410527 ML103410530	I.5.2, I.5.19, I.5.28
Day, Collin	Member of the Public	040	ML102310563	I.5.4, I.5.5, I.5.13, I.5.28
de Weerd, Tammy	Mayor, City of Meridian, Idaho	041	ML102310563	I.5.2, I.5.19
Deal, John	Hyperion Power	042	ML102280389	I.5.2, I.5.3

<sup>a</sup> The comment document provided and signed by Greg Crockett was also signed by an additional 114 individuals in support of the statement in the document.

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Deschamps, Rocky	Member of the Public	043	ML102320123	I.5.2, I.5.19
Donnelly, Dennis	Member of the Public	044	ML102320123	I.5.5, I.5.6
Drake, Joan W.	Member of the Public	045	ML102530072	I.5.18, I.5.25
Dudley, Mr. and Mrs. David	Members of the Public	046	ML102580057	I.5.1
Duffin, Alison	Member of the Public	202	ML102630195	I.5.1, I.5.4
Dugge, Danielle	Member of the Public	203	ML102630195	I.5.1, I.5.6
Dunham, Mark	Idaho Associated General Contractors	047	ML102310563	I.5.19
Emerson, Genevieve	Member of the Public	048	ML102580081	I.5.1, I.5.5, I.5.13, I.5.18, I.5.21
Everett, Victoria	Member of the Public	049	ML102310563	I.5.16, I.5.21
Fauci, Joanie	Member of the Public	050	ML102430033	I.5.1, I.5.5, I.5.6, I.5.13, I.5.16, I.5.18, I.5.19, I.5.21, I.5.22
Filkins, Susan	Member of the Public	204	ML102630195	I.5.1, I.5.6
Flowers, Jackie	Member of the Public	051	ML102320123	I.5.2, I.5.3, I.5.4
Fuger, Rod	Member of the Public	052	ML102600333	I.5.2
Fuhrman, Jared	Mayor, City of Idaho Falls, Idaho	053	ML102310563 ML102320123 ML102280389	I.5.2, I.5.3
Fullmer, Paul	Member of the Public	054	ML102280389	I.5.19
Galaviz, Claudia	Member of the Public	055	ML102650572	I.5.1, I.5.5

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Galaviz, Mark	Member of the Public	056	ML102650572	I.5.1, I.5.5
Garman, Steven P.	Sun Valley Air, LLC	057	ML102530079	I.5.1
Gerber, Matt	Member of the Public	058	ML102280389	I.5.2
Giles, Lance	Member of the Public	059	ML102280511	I.5.2, I.5.3
Gianotto, Ericka	Idaho Falls Mayor's Youth Advisory Council	060	ML102320123	I.5.3
Greco, Nancy	Member of the Public	061	ML102580036	I.5.1, I.5.6, I.5.18
Grigg, Trevor	Member of the Public	062	ML102310563	I.5.19
Guerri, Andrea	Member of the Public	205	ML102630195	I.5.1, I.5.4
Haga, Martha	Member of the Public	063	ML102500566 ML102500567	I.5.1, I.5.5, I.5.6, I.5.8
Hally, Tom	City Council Member, City of Idaho Falls	064	ML102390267	I.5.2
Hanson, Pamela	Member of the Public	206	ML102630195	I.5.1, I.5.4
Hardcastle, Ida	City Council Member, City of Idaho Falls	065	ML102280389	I.5.2, I.5.3, I.5.19
Hardesty, Toni	Idaho Department of Environmental Quality	066	ML102580073	I.5.5, I.5.11, I.5.13, I.5.16, I.5.17, I.5.18, I.5.21, I.5.22, I.5.27
Harris, Drew	Member of the Public	207	ML102630195	I.5.1, I.5.6
Hart, Mike	Member of the Public	067	ML102310563 ML102320123	I.5.2, I.5.3, I.5.4, I.5.6, I.5.10, I.5.14, I.5.21, I.5.23, I.5.28

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Harvey, Emily	Member of the Public	208	ML102630195	I.5.1, I.5.6
Hausrath, Anne	Member of the Public	068	ML102310563 ML102600323	I.5.1, I.5.3, I.5.4, I.5.13, I.5.16, I.5.28
Hawke, Scott	Member of the Public	069	ML102390285	I.5.3
Hemingway, Virginia	Member of the Public	070	ML102310563	I.5.1, I.5.16, I.5.18, I.5.21
Hensel, David	Member of the Public	071	ML102320123	I.5.4, I.5.5, I.5.6, I.5.18
Herring, J. Stephen	Member of the Public	072	ML102320123 ML102280389	I.5.2, I.5.4
Hollar, Courtney	Member of the Public	209	ML102630195	I.5.1, I.5.4
Holzmer, Mark	Member of the Public	073	ML102390271	I.5.3, I.5.19
Hoovis, Tyler	Member of the Public	210	ML102630195	I.5.1, I.5.4
Howard, Don	Member of the Public	074	ML102310563	I.5.13, I.5.28
Huddleston, Leslie	On behalf of U.S. Senator Mike Crapo of Idaho	075	ML102320123	I.5.2, I.5.3, I.5.4
Huebner, Martin	Member of the Public	076	ML102320123	I.5.2, I.5.3
Hyatt, Larry	Member of the Public	077	ML102310563 ML102320123 ML102580055	I.5.3, I.5.18, I.5.25
Jaquet, Wendy	Idaho State Representative, District 25	078	ML102530080	I.5.1, I.5.5, I.5.13, I.5.16, I.5.18



**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Jensen, Kristen	Eastern Idaho Economic Development Partners	079	ML102280511 ML102280389	I.5.2, I.5.3
Joelson, Olivia	Member of the Public	211	ML102630195	I.5.1, I.5.4
Johnson, Don	Member of the Public	080	ML102320123	I.5.19
Johnson, Lea	Member of the Public	081	ML102650572	I.5.1, I.5.4
Johnson, Naomi	Member of the Public	212	ML102630195	I.5.1, I.5.4
Johnston, Michael P.	Member of the Public	082	ML102390241	I.5.2
Jones, Darvel	Member of the Public	213	ML102630195	I.5.1, I.5.6
Jones, Diane	Member of the Public	083	ML102310563	I.5.1, I.5.3, I.5.4, I.5.5, I.5.14, I.5.18, I.5.22
Jones, Michael R.	Member of the Public	084	ML102580034	I.5.1
Jonkouski, David	Member of the Public	085	ML102600323	I.5.1
Jull, Paula	Member of the Public	086	ML102580049	I.5.4, I.5.5, I.5.14, I.5.18, I.5.25
Kasnicki, Dennis	Member of the Public	087	ML102390270	I.5.5, I.5.13, I.5.19, I.5.21, I.5.27
Kay, Jim	AREVA Enrichment Services LLC	228	ML103410510	I.5.3, I.5.29
Kidwell, Stan	Member of the Public	088	ML102580060	I.5.4, I.5.5, I.5.6, I.5.8, I.5.14, I.5.18, I.5.21, I.5.28
Kiefer, Sharon W.	Idaho Department of Fish and Game	089	ML102580074	I.5.8, I.5.14, I.5.27

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Kjellander, Paul	On behalf of Idaho Governor Butch Otter	090	ML102310563	I.5.2, I.5.4, I.5.19
King, Jacob	Member of the Public	214	ML102630195	I.5.1, I.5.6
Kull, Arthur	Kull Food Technologies LLC	091	ML102390247	I.5.5
Lagergren, Ginna and Ken	Members of the Public	092	ML102510649	I.5.13
Landry, Louis	Member of the Public	093	ML102650572	I.5.1, I.5.8
Lange, Michael	Member of the Public	094	ML102320123	I.5.2, I.5.3, I.5.11
Larsen, Verlyn	Member of the Public	215	ML102630195	I.5.1, I.5.4
Lee, Beau	Member of the Public	216	ML102630195	I.5.1, I.5.6
Leeuwrik, Linda	Member of the Public	095	ML102530078	I.5.4, I.5.5, I.5.6, I.5.8, I.5.14, I.5.18, I.5.25, I.5.28
Makhijani, Arjun	Institute for Energy and Environmental Research	096	ML102320123 ML102280389	I.5.4, I.5.6, I.5.7, I.5.18
Martin, Bryan	Member of the Public	097	ML102310563	I.5.25
Martin, Linda	Grow Idaho Falls	098	ML102310563 ML102390240	I.5.2, I.5.3, I.5.4, I.5.6, I.5.11, I.5.16, I.5.19
Martin, Linda	On behalf of the Eastern Idaho Economic Development Partners	194	ML102310563 ML102320123	I.5.2, I.5.3
Martin, Linda	On behalf of the Eastern Idaho Economic Development Association	196	ML102320123	I.5.2, I.5.3
Mathieu, Brent	Member of the Public	099	ML102650572	I.5.1, I.5.6

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Matson, Wendy	Member of the Public	100	ML102310563 ML102650572	I.5.1, I.5.4, I.5.6, I.5.12, I.5.13, I.5.18, I.5.21
May-Chang, Jody	Member of the Public	101	ML102650572	I.5.1, I.5.5
Maynard, R.D.	Member of the Public	102	ML102310563	I.5.3, I.5.11, I.5.13
McCall, Karen	Member of the Public	103	ML102580087	I.5.1, I.5.4, I.5.5, I.5.6, I.5.13, I.5.17, I.5.18, I.5.19
McCollum, Carolyn	Member of the Public	104	ML102460018	I.5.4, I.5.18
McConaughy, Eve	Member of the Public	105	ML102260323	I.5.1, I.5.3, I.5.5, I.5.13, I.5.16, I.5.18
McConaughy, Ted	Member of the Public	106	ML102310563	I.5.1, I.5.5, I.5.19
McKay, Jean	Member of the Public	107	ML102320123 ML102280389	I.5.1
McKelvey, Jodie	Member of the Public	217	ML102630195	I.5.1, I.5.4
McMahon, John C.	Member of the Public	108	ML102580051	I.5.6
McVey, Eugene	Member of the Public	109	ML102650572	I.5.1, I.5.8
Medlin, John and Susan	Members of the Public	110	ML102390273	I.5.4, I.5.5, I.5.13, I.5.18
Meikle, Robert	Member of the Public	111	ML102310563	I.5.2, I.5.18
Menlove, Mark	Member of the Public	112	ML102580033	I.5.1, I.5.6
Miller, Ken	Member of the Public	113	ML102320123 ML102580037	I.5.1, I.5.4, I.5.5, I.5.23, I.5.25

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Minick, David	Member of the Public	218	ML102630195	I.5.1, I.5.6
Mitchell, Anne	Member of the Public	114	ML102600333	I.5.2
Miyaoka, Neil	Member of the Public	219	ML102630195	I.5.1, I.5.6
Molenaar, Nicholas	Member of the Public	115	ML102280511	I.5.3, I.5.4
Mondy, Richard	Member of the Public	116	ML102360687	I.5.2
Morgan, Richard	Member of the Public	117	ML102650572	I.5.1, I.5.5
Morris, Caroline	Member of the Public	118	ML102580069	I.5.1, I.5.4, I.5.5, I.5.8
Naftzger, Tim	Member of the Public	220	ML102630195	I.5.1, I.5.6
Neilson, Bob	Member of the Public	119	ML102310563	I.5.2
Nicholson, Frank	Member of the Public	120	ML102280511 ML102580048	I.5.1, I.5.3, I.5.4, I.5.5, I.5.8
Nordstrom, Jennifer	Member of the Public	121	ML102580039	I.5.1, I.5.8
O'Brien, Kathy	Member of the Public	122	ML102580086	I.5.1, I.5.4, I.5.5, I.5.8, I.5.13, I.5.14, I.5.18, I.5.21, I.5.25
Otter, Butch	Governor, State of Idaho	123	ML102310563 ML102320123 ML102600333	I.5.2, I.5.4, I.5.19
Packwood, Lane	Idaho Department of Commerce	124	ML102310563	I.5.3, I.5.19, I.5.25
Paquette, Holly	Member of the Public	125	ML102310563	I.5.1, I.5.18

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Pengilly, Susan	Idaho State Historical Society, State Historic Preservation Office	126	ML102150425	I.5.9
Perrington, Mike	Member of the Public	221	ML102630195	I.5.1, I.5.6
Pierce, Vanessa	Health Environment Alliance of Utah (HEAL Utah)	198	ML102600070	I.5.18
Plowman, Sheila	Member of the Public	127	ML102580059	I.5.1, I.5.4, I.5.8, I.5.21
Poyser, Bob	AREVA Enrichment Services, LLC	128	ML102310563	I.5.2, I.5.4, I.5.13, I.5.18, I.5.19, I.5.28
Preacher, Willie	The Shoshone-Bannock Tribes	129	ML102580061	I.5.9, I.5.16, I.5.21, I.5.22
Price, Park and Sharon	Members of the Public	130	ML102390269	I.5.3, I.5.4, I.5.28
Prisament, Morty	Member of the Public	131	ML102580091	I.5.3, I.5.4, I.5.5, I.5.6, I.5.7
Proksa, Margo and Dennis	Members of the Public	132	ML102320123 ML102280389	I.5.5
Provencher, Richard B.	Member of the Public	133	ML102390264	I.5.2, I.5.3, I.5.4, I.5.8, I.5.13, I.5.16, I.5.17, I.5.18, I.5.19
Quapp, William	Member of the Public	134	ML102320123	I.5.2
Radford, Dave	Bonneville County Commissioner	135	ML102320123	I.5.2, I.5.3, I.5.8, I.5.9, I.5.19
Raines, Hannah	Member of the Public	222	ML102630195	I.5.1, I.5.4
Rainey, Susan	Member of the Public	136	ML102600323	I.5.16, I.5.18
Reeves, Ralph	Member of the Public	137	ML102280389	I.5.2, I.5.19



**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Reichgott, Christine	U.S. Environmental Protection Agency, Region 10	138	ML102580090	I.5.3, I.5.9, I.5.10, I.5.11, I.5.13, I.5.14, I.5.19, I.5.25, I.5.27
Revier, John	On behalf of U.S. Congressman Mike Simpson of Idaho	139	ML102310563	I.5.2, I.5.4
Reynolds, Wendy	U.S. Department of the Interior, Bureau of Land Management, Upper Snake Field Office	140	ML102390288	I.5.8, I.5.10, I.5.14, I.5.23, I.5.25
Richens, Mason	Member of the Public	223	ML102630195	I.5.1, I.5.6
Rickards, Peter	Member of the Public	141	ML102580078	I.5.3, I.5.17, I.5.21, I.5.24
Rindlisbacher, Blake	Idaho Transportation Department	142	ML102580050	I.5.3, I.5.16
Risch, James	U.S. Senator – Idaho	143	ML102320123 ML102600333	I.5.2, I.5.3, I.5.4, I.5.13
Rodgers, Sara	Member of the Public	144	ML102580085	I.5.1, I.5.5
Rolsen, A.	Member of the Public	224	ML102630195	I.5.1, I.5.4
Rydalch, Ann	National Foundation for Women Legislators	145	ML102320123 ML102280389	I.5.2, I.5.3, I.5.4, I.5.19
Sayer, Doug	Premier Technology	146	ML102310563	I.5.2, I.5.19
Schueler, Joe	Member of the Public	147	ML102310563 ML102280511 ML102390244	I.5.1, I.5.3, I.5.4, I.5.5, I.5.6, I.5.7, I.5.9, I.5.13, I.5.14, I.5.16, I.5.17, I.5.18, I.5.19, I.5.22, I.5.28

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Schuler, Eric	Member of the Public	148	ML102310563	I.5.1, I.5.4, I.5.5, I.5.7, I.5.18, I.5.21
Secret, Wendi	Idaho Economic Development Association	149	ML102280389	I.5.2, I.5.3
Seevers, Katie	Member of the Public	150	ML102310563	I.5.1, I.5.4, I.5.12, I.5.13, I.5.18, I.5.19, I.5.25
Sellers, Beth	Member of the Public	151	ML102280389	I.5.2, I.5.3
Serr, Steven	Planning and Zoning Administrator, Bonneville County, Idaho	152	ML102310563 ML102320123	I.5.2, I.5.3, I.5.8, I.5.10, I.5.11, I.5.12, I.5.16, I.5.21
Shiple, Andrea	Member of the Public	153	ML102580047	I.5.1, I.5.4, I.5.5, I.5.8, I.5.9, I.5.10, I.5.13, I.5.14, I.5.16, I.5.18, I.5.23, I.5.25
Shiple, Andrea	On behalf of the Snake River Alliance	197	ML102320123	I.5.1, I.5.4, I.5.5, I.5.8, I.5.9, I.5.13, I.5.14, I.5.16, I.5.18, I.5.23, I.5.25
Shiple, Diana	Member of the Public	154	ML102580077	I.5.1, I.5.19, I.5.22
Shivly, Jerry	Member of the Public	155	ML102320123	I.5.2, I.5.19
Simison, Robert	On behalf of Mayor Tammy de Weerd, City of Meridian, Idaho	156	ML102310563	I.5.2, I.5.19
Simpson, Erik	Idaho State Representative, District 32	157	ML102310563 ML102320123	I.5.2, I.5.3, I.5.4, I.5.16, I.5.17, I.5.18, I.5.19, I.5.21, I.5.22
Simpson, Mike	U.S. Congressman, Idaho	158	ML102310563	I.5.2, I.5.4

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Skinner, Robert	Member of the Public	159	ML102320123	I.5.3
Smith, Jeff	Local 449, IBEW	160	ML102320123	I.5.2
Smith, Marisa	Member of the Public	161	ML102460017	I.5.1, I.5.4, I.5.6
Smith, Michael	Member of the Public	162	ML102390261	I.5.2
Smith-Putnam, Cindy	Grow Idaho Falls	163	ML102320123	I.5.2, I.5.3, I.5.4, I.5.19
Solomon, Timothy	Regional Development Alliance	164	ML102310563	I.5.19
Staker, Lee	Bonneville County Commissioner	165	ML102310563	I.5.19
Stears, Allen	Member of the Public	166	ML102390245	I.5.2
Stevenson, Andrew	Idaho Falls Mayor's Youth Advisory Council	167	ML102320123	I.5.2
Stewart, Lon	Member of the Public	168	ML102580062	I.5.1, I.5.4, I.5.5, I.5.6, I.5.13, I.5.17, I.5.18, I.5.19
Stewart, Margaret	Member of the Public	169	ML102320123	I.5.1, I.5.4, I.5.5, I.5.12, I.5.16, I.5.18, I.5.21
Stimpson, Lisa	Member of the Public	225	ML102630195	I.5.1, I.5.4
Strobel, David	Member of the Public	170	ML102390266	I.5.2
Tanner, John	Member of the Public	171	ML102320123	I.5.2, I.5.4, I.5.12, I.5.17, I.5.18
Taylor, Amy	On behalf of U.S. Senator Risch of Idaho	172	ML102320123	I.5.2, I.5.3, I.5.4, I.5.13
Taylor, David	Member of the Public	173	ML102390262	I.5.2, I.5.4

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Thomas, Christopher	Health Environment Alliance of Utah (HEAL Utah)	174	ML102600070	I.5.18
Thomas, Ellen	Member of the Public	175	ML102580058	I.5.1, I.5.4, I.5.5, I.5.6, I.5.8, I.5.14, I.5.18, I.5.25
Thompson, Jeff	Idaho House of Representatives	176	ML102320123 ML102280389	I.5.2, I.5.3, I.5.4, I.5.19
Thompson, Jeff	On behalf of Idaho Governor Butch Otter	195	ML102320123 ML102600333	I.5.2, I.5.4, I.5.19
Thomson, T.J.	City Council Member, City of Boise, Idaho	177	ML102580170	I.5.3, I.5.28
Toinga, Jessica	Member of the Public	226	ML102630195	I.5.1, I.5.6
Trane, Randy	Member of the Public	178	ML102390252	I.5.2, I.5.3, I.5.19
Turek, Jolie	Eastern Idaho Economic Development Partners	179	ML102280511 ML102280389	I.5.2, I.5.3
Turner, Kaye	Member of the Public	180	ML102580084	I.5.1, I.5.4, I.5.5, I.5.17, I.5.18, I.5.19
Turner, Roger	Member of the Public	181	ML102320123 ML102580075 ML102580080	I.5.1, I.5.3, I.5.4, I.5.5, I.5.6, I.5.7, I.5.13, I.5.16, I.5.17, I.5.18, I.5.19, I.5.21, I.5.25, I.5.28
Ursenbach, Brianna	Member of the Public	182	ML102310563	I.5.4, I.5.19, I.5.28
Vincent, James D.	Member of the Public	183	ML102320123 ML102280389	I.5.1, I.5.4, I.5.5, I.5.13, I.5.14, I.5.18, I.5.19

**Table I-1 Draft EIS Commenter Identification and Comment Response Locations (Cont.)**

<b>Commenter Name</b>	<b>Affiliation</b>	<b>Commenter Number</b>	<b>Comment Document(s) ADAMS Accession Number(s)</b>	<b>Subsection(s) Containing Comments and Responses</b>
Vincent, Kitty	Member of the Public	184	ML102390263 ML102390272	I.5.1, I.5.4, I.5.5, I.5.6, I.5.8, I.5.9, I.5.10, I.5.12, I.5.13, I.5.14, I.5.18, I.5.19, I.5.21, I.5.23, I.5.25
Virgin, Wade	Idaho Department of Labor	185	ML102320123	I.5.19
Voss, Joseph	Member of the Public	227	ML102630195	I.5.1, I.5.6
Walker, Lauren	Walker Land and Cattle Company	186	ML102320123	I.5.2
Weber, John	Member of the Public	187	ML102310563	I.5.1, I.5.4, I.5.18, I.5.19, I.5.22
Weber-Wells, Lana	Member of the Public	188	ML102430049	I.5.1, I.5.5
Weil, Josh	Member of the Public	189	ML102310563	I.5.19
Whaley, Dave	Idaho State AFL-CIO	190	ML102440327	I.5.19
Woodruff, Liz	Member of the Public	191	ML102320123 ML102580035	I.5.1, I.5.4, I.5.5, I.5.6, I.5.8, I.5.9, I.5.10, I.5.12, I.5.13, I.5.14, I.5.16, I.5.18, I.5.19, I.5.21, I.5.23, I.5.25
Woodruff, Liz	On behalf of the Snake River Alliance	193	ML102310563 ML102310570	I.5.1, I.5.4, I.5.5, I.5.6, I.5.8, I.5.9, I.5.10, I.5.14, I.5.17, I.5.18, I.5.21, I.5.25, I.5.28
Young, Lisa	Member of the Public	192	ML102310563	I.5.1, I.5.4, I.5.5, I.5.6, I.5.13, I.5.14, I.5.16, I.5.17, I.5.18, I.5.21, I.5.25



1 **I.5 Public Comments on the Draft EIS and NRC Responses**  
2

3 Following are all of the comments received by the NRC on the Draft EIS and the NRC staff's  
4 responses to those comments. As discussed in Section I.3.3, the comments are arranged by  
5 topic in the 29 subsections below, and multiple comments that address a similar issue/topic  
6 have been grouped together for a common response. In cases where one or more commenters  
7 had identical comments, those comments are shown only once preceded by the commenter  
8 numbers and names of all the commenters who provided those identical comments. Also,  
9 please note that some comments contain more than one issue/topic as presented below  
10 because the comment text with respect to each issue cannot be readily separated from the  
11 other issues. Such comments are necessarily included under more than one topic so that all of  
12 the issues can be addressed in the NRC responses.  
13

14 Note that comments taken from written comment documents (e.g., letters, emails) are  
15 reproduced below "as is"; i.e., those comments are reproduced exactly as they were provided,  
16 and the NRC staff has not attempted to correct spelling or grammatical errors in these  
17 comments. Also, due to possible transcription errors by the court reporters during the public  
18 comment meetings, the NRC regrets if the text of any oral comment does not exactly match  
19 what was said at a public meeting.  
20  
21

22 **I.5.1 General Opposition to the Project**  
23

24 The comments addressed in this subsection are those that are limited to expressing opposition  
25 in some manner to the proposed EREF project. However, comments that contain general  
26 opposition statements and also include topics that are relevant to issues addressed within the  
27 scope of the EIS are not included in this subsection, but are instead included and addressed  
28 elsewhere in Section I.5, in the subsections relevant to the specific topics discussed.  
29

30 **Comment:** The following comment expresses concern that AES has already signed contracts to  
31 sell the product of the proposed EREF when the proposed plant does not yet have an NRC  
32 license.  
33

34 **[015-04, Beatrice Brailsford]** AREVA has said U.S. companies have already signed contracts  
35 for half its projected production. Those contracts raise another question, though.  
36

37 I know the NRC has already heard concerns that it has a bias towards licensing. What about  
38 selling the product of a plant that doesn't even have a license yet? I'd say we've gone well  
39 beyond a learner's permit here.  
40

41 **Response:** *AES has submitted a license application to the NRC for the construction, operation,*  
42 *and decommissioning of the proposed EREF, to produce enriched uranium for commercial*  
43 *nuclear reactors. As part of its business plan, AES may wish to ascertain that there is a*  
44 *consumer for its product. AES appears to have done so by contracting future services to be*  
45 *provided by the proposed EREF. These actions were taken by AES at the risk of not receiving*  
46 *a license from the NRC, and such risks are borne solely by AES. These actions have no*  
47 *bearing on the NRC's decision to grant or deny AES's license application.*  
48

1 **Comment:** The following comment expresses concern about what resources provided by Idaho  
2 taxpayers will be used for the proposed EREF project.

3  
4 **[105-03, Eve McConaughey]** I am concerned about what resources e.g.  
5 land/water/energy/raw materials will be used (provided by Idaho taxpayers).

6  
7 **Response:** AES could contract with Idaho State or local government agencies, or apply for  
8 resources from those agencies, to the extent permitted under Idaho law.

9  
10  
11 **Comment:** The following comments deal with the current operating and construction trends for  
12 nuclear power plants in the U.S. and worldwide.

13  
14 **[015-02, Beatrice Brailsford]** Eight years later, there are no more nuclear reactors operating in  
15 the world, but as of June, URENCO, a German company, is enriching uranium in New Mexico.

16  
17 **[015-12, Beatrice Brailsford]** Furthermore, eight years after Mr. Magwood's letter\*, there are  
18 no more nuclear reactors operating in the US or in the world, but as of June, Urenco, a German  
19 company, is enriching uranium in New Mexico, which the draft NRC only sporadically  
20 acknowledges.

21 \* Note from NRC: This refers to a letter identified in comment 015-09 and archived in ADAMS under Accession  
22 Number ML022350130.

23  
24 **[180-09, Kay Turner]** Is it true there are less reactors operating now than there were eight  
25 years ago?

26  
27 **Response:** *Within the last 10 years, 32 new nuclear power plants have become operational in*  
28 *the world, 31 have shutdown, and construction began on 50 additional nuclear plants (IAEA,*  
29 *2010a, 2010b). One of the new plants under construction is in the United States. In addition, as*  
30 *of December 2010, the NRC is actively reviewing 12 applications for a total of 20 nuclear*  
31 *reactor units. The number of operating nuclear power plants in the world has risen from 416 in*  
32 *1990 to 435 in 2000 and 441 in 2010. The net electrical power generated by these facilities rose*  
33 *from 318,000 megawatts electric [MW(e)] in 1990 to 350,000 MW(e) in 2000 and 375,000*  
34 *MW(e) in 2010 (IAEA, 2010a, 2010b).*

35  
36 *URENCO USA, the uranium enrichment facility in New Mexico (formerly known as the National*  
37 *Enrichment Facility [NEF]) that began initial operations in June 2010, is still under construction*  
38 *and will continue to increase production as its remaining cascade halls are completed. This*  
39 *facility is operated by Louisiana Energy Services LLC (LES), a U.S. Delaware limited liability*  
40 *company.*

41  
42  
43 **Comment:** The following comments express general opposition to the proposed EREF project  
44 and request that the NRC deny the license application.

45  
46 **[014-04, William Blair]** I urge decision makers to disapprove this and any other radioactive  
47 processing.

1 **[008-08, Carol Bachelder]** I am in favor of the no action alternative.  
2  
3 **[017-02, Sally Briggs]** I am Sally Briggs, an air breathing, water and milk drinking native of  
4 Idaho...raised during a time when nuclear fallout drills consisted of sheltering under our desks  
5 at school. Sometime later, grown with my own children, I received a postcard addressed to  
6 "Dear neighbor" asking "Where were you between 1944 and 1972?" Informing me that I may  
7 have been exposed to radioactive material released into the air, water, and soil by the Hanford  
8 Nuclear Facility. Much later I learned in "secret" experiments. I have since become aware that in  
9 its 45 year history 1million curies of iodine 131 have been released! SUCH HUBRIS! Do we  
10 think the scientists employed by Areva are smarter or have a greater moral sense than those at  
11 Hanford? LESS HUBRIS?  
12  
13 **[019-03, George Buehler]** I see this scheme as ill-considered, unnecessary, exploitive and  
14 wrong. I am categorically opposed to the Areva Uranium Enrichment Plant.  
15  
16 **[046-01, Mr. and Mrs. David Dudley]** Just say NO to AREVA'S URANIUM FACTORY~  
17 NUREG 1945!  
18  
19 **[050-01, Joanie Fauci]** I would like it to be known that I support the No Action Alternative and  
20 wish for the NRC to adopt that alternative.  
21  
22 **[057-01, Steven Garman]** We do not need, do not want or will not tolerate an enrichment  
23 facility in Idaho. Please reconsider.  
24  
25 **[068-05, Anne Hausrath]** We believe the proposed facility is a bad idea. It is not necessary to  
26 meet Idaho's needs. It would pose a potential threat to the safety of our children, grandchildren,  
27 and future generations, and we strongly recommend you to adopt the "no action alternative."  
28  
29 **[084-01, Michael Jones]** The environmental impacts of nuclear waste will be an unwanted  
30 legacy. If you think the national debt will take forever to payoff, then you have no  
31 comprehension of the servitude that nuclear waste will have on our country and future countless  
32 generation. The enrichment facility is unnecessary for national defense, current domestic use.  
33 Before you increase the waste load get a solution established that is sound and long term.  
34  
35 **[085-01, David Jonkouski]** The horrors of Ballistic Uranium is not ...[ILLEGIBLE TEXT]... to  
36 electric generation by the atom. It is not necessary. The inventor of alternating current Tesla  
37 said rightly "we are in a sea of energy." Wars are caused by artificial scarcity. If an intelligent  
38 person who can do the math of electromagnetic theory of Maxwell and Heaviside can see pos  
39 and neg vectors in quaternion calculus. This is FREE ...[ILLEGIBLE TEXT]...energy beyond  
40 the trinomial of current easy to engineer math of Einstein, who knew that the universe was  
41 curved, but in a quaternion (4 part) math it is easy to see small spaces are curved also. This is  
42 the obvious proof of ambient energy. Free Science!  
43  
44 **[103-01, Karen McCall]** I am writing to express my opposition to Areva's gas centrifuge  
45 uranium enrichment plant proposed to be built in Eastern Idaho. There are many reasons why  
46 this plant is unnecessary:.. I am strongly opposed to Areva's proposal and want my comments  
47 to go on record.  
48  
49 **[120-06, Frank Nicholson]** This enrichment factory: ...should not be licensed.  
50

1 **[127-03, Sheila Plowman]** I oppose the building of the uranium enrichment plant.... Please Do  
2 Not approve the building of this dangerous plant.

3  
4 **[168-01, Lon Steward]** Areva should not be allowed to build a uranium enrichment plant in  
5 Eastern Idaho.... From a business perspective, a financial perspective, world peace, energy  
6 independence, environmental, global warming, and common sense perspectives, the Areva  
7 enrichment plant in Eastern Idaho does not make sense and therefore the Nuclear Regulatory  
8 Commission should not license the plant.

9  
10 **[175-01, Ellen Thomas]** I oppose the proposed new Areva uranium factory in Idaho, or  
11 anywhere else.

12  
13 **[181-09, Roger Turner]** The State of Idaho should say no to this project and the NRC should  
14 revise the final EIS to a no action alternative.

15  
16 **[184-03, Kitty Vincent]** Human Folly: While we spend billions of dollars searching for water in  
17 outer space on various planets, we are hard at work on Earth poisoning our own water supplies,  
18 not to mention the air as well. Not only does this enrichment plant appear to unnecessary, it  
19 seems to represent human folly at its best.

20  
21 **[193-01, Liz Woodruff, on behalf of the Snake River Alliance]** And it's the proposition of the  
22 Snake River Alliance that the NRC should not license the AREVA facility. First, uranium  
23 enrichment should not occur in Idaho for use in power reactors, and secondly, the draft EIS is  
24 inadequate.

25  
26 ***Response:** The NRC staff acknowledges these comments and appreciates the public*  
27 *participation. However, these comments are outside the scope of the EIS analysis because*  
28 *they do not directly relate to the content of the Draft EIS.*

29  
30  
31 **Comment:** The following comments note that there is no need to rush through the process of  
32 licensing the proposed EREF and to make sure that all risks have been addressed. Some of  
33 these comments also express opposition to the proposed EREF project.

34  
35 **[008-05, Carol Bachelder]** I appreciate the fact that AREVA put in an application in 2008, and  
36 that was two years ago, and the Environmental Impact Statement was released two weeks ago,  
37 and here we're having a hearing on it. It does seem like it's on the fast track, and we'd like to put  
38 it on the slow track. I would like to derail it completely.

39  
40 **[017-01, Sally Briggs]** I urge you, as regulators, to apply a healthy dose of skepticism to these  
41 plans. Do we really need domestic production? Have all the risks been addressed? Please  
42 demonstrate courage in protecting our children, grandchildren, and all those who follow.

43  
44 **[025-01, Hon. Sue Chew]** So, you know, I'm looking at the issues that we're looking at in terms  
45 of your EIS, and I do want to make sure that we aren't fast-tracking anything, that there aren't  
46 any corners being cut, and that things aren't moving along too fast, because, really, just like in  
47 the practice of medicine, when you make a mistake like this, you can't undo it. This is about life.

1 **[070-05, Virginia Hemingway]** For these, and many other reasons, I adamantly am opposed  
2 to this plant being built and to the Idaho taxpayers' money paying for an off-ramp to nowhere,  
3 except sagebrush. These few facts prove that once again, Idaho's leaders, and the NRC, have  
4 shown they do not consider the long-term consequences of decisions made in haste, without  
5 appropriate research. As a fourth generation Idahoan, I do not need, nor do I want, this kind of  
6 danger in my state.

7  
8 **[148-01, Eric Schuler]** Taken as a whole, the EIS suggests that this facility will have a  
9 relatively low impact on the environment. Of course several aspects of this, of the—have been  
10 overlooked in making this conclusion. For instance, as others have already noted, it does not  
11 consider the impact of the exempted preconstruction activities, the high risk of wildfires in the  
12 area, or the lack of an appropriate disposal pathway for depleted uranium. Accordingly, the true  
13 impact of this facility is certainly larger than the DEIS suggests.

14  
15 **[147-14, Joey Schueler]** 10. Why is this plant being pushed through so quickly? The EIS is still  
16 in the assessment phase, yet many steps have already been taken that affect Idaho's budget. If  
17 this decision so critical, it should be carefully considered and brought to the Idaho public before  
18 money is expended on its behalf.

19  
20 **[191-03, Liz Woodruff]** I don't think there's any reason to expedite any aspect of this process.

21  
22 **Response:** *Consistent with the requirements of NEPA and the NRC's NEPA implementing*  
23 *regulations under 10 CFR Part 51, the NRC staff evaluated and compared the environmental*  
24 *impacts of the proposed action and its alternatives. The Draft EIS described the proposed*  
25 *action (Chapters 1 and 2), the purpose and need for the proposed action (Chapter 1),*  
26 *alternatives to the proposed action (Chapter 2), the potentially affected environment*  
27 *(Chapter 3), the environmental impacts of the proposed action and proposed mitigation*  
28 *(Chapters 4 and 5), the cumulative impacts of the proposed action (Chapter 4), and the benefits*  
29 *and costs of the proposed action (Chapter 7). The analysis contained in the Draft EIS fully*  
30 *considered the environmental impacts of the proposed action and alternatives. The NRC will*  
31 *not make a final decision on whether to grant a license for the proposed EREF until after the*  
32 *NRC's ASLBP conducts public hearings on the safety and environmental reviews. (The hearing*  
33 *process is discussed in Section I.4 of this appendix).*

34  
35  
36 **Comment:** The following comments request that the NRC take AREVA's reputation, foreign  
37 ownership, past and present business practices, and past and anticipated environmental and  
38 safety record into account when considering whether to license the proposed EREF. Some of  
39 these comments also express general opposition to the proposed EREF project.

40  
41 **[031-01, James Cooper]** I am OPPOSED to the Areva project. As an Idaho taxpayer and voter  
42 I feel this state does NOT NEED a foreign company to build any facility on our soil - much less  
43 one which is subject to accidents and one whose profits go to another country.

44  
45 **[032-04, Cindy Cottrell]** I'm against a foreign country making the profit from this plant and  
46 leaving the contamination in our Country. Not just the by-product of waste will we have to store,  
47 but Areva has a history of contamination in their own Country's waterways.



1 **[037-01, Katherine Daly]** The Areva uranium enrichment proposal is very disturbing to both of  
2 us. Please don't sell us down the road. Areva does not meet with the approval of many  
3 Idahoans who would like to preserve the natural integrity of our incredible state. PLEASE...just  
4 say no to Areva.  
5

6 **[048-03, Genevieve Emerson]** I am concerned that Areva has no true vested interest in the  
7 overall health and well being of the land or the people of Idaho, other than economic gain, and  
8 this poses a direct threat to present and future generations of all life in this area.  
9

10 **[061-03, Nancy Greco]** It amazes me that, in a state which argues against federal involvement  
11 in state affairs, even when that involvement benefits Idaho citizens, the same state would  
12 welcome and encourage a harmful company which is almost entirely funded by the French  
13 government. Please be very cautious in giving Areva the necessary pathway to this destructive  
14 plant.  
15

16 **[107-01, Jean McKay]** But I ask you, the Nuclear Regulatory Commission, to include in your  
17 study of the potential environmental impacts the record of AREVA in France, and elsewhere.  
18 And to delay any exemption or approval until after such a study has been completed and  
19 revealed to the public.  
20

21 You've already heard about situations that have occurred in France. The Nuclear Safety  
22 Authority of France, the ASN, cited a series of frauds and human negligence fraud, and ordered  
23 the closure of an AREVA subsidiary. Possible legal action was also being considered because  
24 of repeated leaks during 2007, 2008 in the site's waste water evacuation system.  
25

26 In California, or in South Carolina, sorry, a mixed oxide fuel assembly was removed from the  
27 plant of Duke Energy/AREVA at Catawba facility because of potentially hazardous physical  
28 changes. In addition, AREVA's plans in the United States to build an evolutionary power  
29 reactor, an EPR, at various sites, including Idaho, have created controversy. In France, as of  
30 August 2008, the construction of an evolutionary power reactor by AREVA has been delayed  
31 because of technical and quality control problems. So, I urge you, the NRC, to include, to  
32 broaden your study, evaluate these reported problems.  
33

34 **[107-02, Jean McKay]** I ask the Nuclear Regulatory Commission to include in the report of  
35 potential environmental impacts the record of Areva in France and elsewhere, and to delay any  
36 exemption or approval until after such a study has been completed and revealed to the public.  
37

38 #1 In July 18, 2008, a Paris newspaper revealed: The Ecology Minister of France announced a  
39 2nd leak in a subsidiary of Areva due to a broken pipe. The 1st leak occurred on July 7, 2008,  
40 and residents of the area were told not to drink the water, or to swim in, to irrigate crops with the  
41 waters of nearby rivers.  
42

43 The Nuclear Safety Authority (ASN) of France cited a series of "frauds and human negligence"  
44 and ordered the closure of the Areva subsidiary. Possible legal action was being considered  
45 because of "repeated leaks" during 2007 in the site's waste water evacuation system.  
46

47 #2 In South Carolina, reported August 2008, an experimental mixed-oxide fuel assembly was  
48 removed from the plant of Duke Energy/Areva Catawaba facility because of "potentially  
49 hazardous physical changes."  
50

1 In addition, Areva's plans in the U.S. to build EPR (Evolutionary Power Reactors) at various  
2 sites including Idaho - have created controversy. In France, as of August 2008, the construction  
3 of these Evolutionary Power Reactors by Areva have been delayed by technical and quality-  
4 control problems.

5  
6 Again, I urge the NRC to include a study and evaluation of these reported problems in its EIS,  
7 and to report them to the public before any exemption or approval is considered.

8  
9 **[118-05, Caroline Morris]** Additionally, Areva's palm-greasing tactics to persuade officials to  
10 welcome the EREF, as the Mayor of Idaho City testified at the August Boise hearing, are pure  
11 bribery. Likely many other Idaho officials and citizens received other valuable favors from Areva,  
12 not publicly announced. Please refer to my letter to the editor published in the Idaho Stateman.  
13 (I am traveling and cannot access its late August or early September printing date.)

14  
15 **[120-04, Frank Nicholson]** This enrichment factory:...

16  
17 • Poses a risk to Idaho's natural resources and people. If something were to happen and when  
18 the plant is shutdown a foreign company does NOT have the incentive to do what is right. They  
19 can leave and we have no recourse. BP is a great example. Also, importing and exporting the  
20 nuclear fuel will not only put ourselves at risk but many others along the path.

21  
22 **[122-02, Kathy O'Brien]** Areva also has a bad track record in France.

23  
24 **[147-09, Joey Schueler]** 5. Areva's financial stability and history of ethics is unclear. Varied  
25 opinions range from sound to on the verge of bankrupt and no clear agreements have been  
26 made ensuring that they will do right by Idaho if this project fails (reference the BP oil spill for a  
27 comparative potential scenario).

28  
29 **[154-01, Diana Shipley]** Before backing a project such as AREVA proposes we need to  
30 consider more than the jobs it would create. Before backing a project such as AREVA proposes  
31 we need to consider more that the wining and dining that is taking place. In this tough economy  
32 it would be easy to welcome AREVA when they are being so generous with catered trips and  
33 lots of flourish.

34  
35 The truth of the matter is this:

36  
37 AREVA dumps at least one million gallons of radioactive waste into the English Channel a year,  
38 contaminating water all the way up to the Arctic Circle. How are their environmental policies  
39 going to take shape in Idaho? Will they be thoughtful that they are located near the aquifer  
40 which provides drinking water to many Idahoans? I can't imagine they will give it a second  
41 thought.

42  
43 They have contaminated towns all around an open pit mine in Niger. Are they worried about the  
44 people of those towns? How are they helping to recover the area back to an environmentally  
45 safe one?

46  
47 Their track record seems to be less than stellar when it comes to environmental issues. They  
48 withheld information from the regulatory commission in France to secure a loan in their own  
49 backyard.

1 **[169-01, Margaret Stewart]** And aside from AREVA's greed, grim, and very, very devastating  
2 global environmental and human rights record around the world, particularly in Africa, I  
3 vehemently oppose the NRC licensing of this facility on grounds that the facility has not been  
4 proven necessary, a huge amount of dangerous radioactive waste that would be created has no  
5 disposal place, the nuclear reactors that the EIS says will need AREVA's product more than  
6 likely will never be built.

7  
8 **[168-04, Lon Stewart]** Areva is processing and handling some of the most dangerous material  
9 on earth. Unfortunately they do not have an exemplary environmental or safety record that  
10 would be expected of a company handling such types of materials. Areva dumps radioactive  
11 waste into the English Channel and there have been a couple of accidents at their plants in the  
12 last few years while they were touting to be a safe company. Accidents will happen. Even if you  
13 think you have enough redundancy built into the system, mechanical things will fail and people  
14 will do stupid things no matter how much training and experience they have. The BP Gulf oil  
15 spill is a case in point. This does not sound good to me.

16  
17 **[181-07, Roger Turner]** It would be opposed because the AREVA company has a poor  
18 environmental record, especially with respect to the radioactive waste handling. It would be  
19 opposed by Idahoans because the AREVA company is in poor financial shape, a condition that  
20 often results in shortcuts in worker safety, worker benefits, and environmental protection.... It  
21 would be opposed because the company is dependent on taxpayers for front-end costs,  
22 because of its own poor financial status.

23  
24 **[180-04, Kaye Turner]** Is it true Areva pumps one million gallons of nuclear waste into the  
25 English Channel every year? Is it true Areva pumps ANY nuclear waste into the English  
26 Channel?

27  
28 **[184-02, Kitty Vincent]** What matters is Areva's history of leaks and pollution overseas as well  
29 as the fact that this plant would sit atop this magnificent aquifer.

30  
31 **[183-03, James Vincent]** I live downwind and downstream of the proposed AREVA plant, and I  
32 have concerns about my safety. As a reference, in July 2008, AREVA had two accidents in  
33 France. One was a burst pipe at a plant at the Romans-sur-Isere, southeastern France, an  
34 AREVA subsidiary. The pipe had been broken for several years. Jean-Pierre Gros of AREVA's  
35 Head of Combustion said between 120 and 750 grams of enriched uranium had leaked.

36  
37 Another accident happened also July of 2008 at the Tricastin site near the historic southeast city  
38 of Avignon; 7,925 gallons of a liquid containing traces of unenriched uranium leaked from a  
39 factory run by AREVA subsidiary, SOCTRI. I can't pronounce it, S-O-C-T-R-I, spilling from a  
40 reservoir that overflowed. The leak flowed into the ground and into the two rivers, Gaffiere and  
41 Lauzon.

42  
43 French authorities banned the consumption of well water and watering of crops, as well as  
44 swimming, fishing, and water sports. There's preliminary evidence of higher incidents of  
45 pancreatic cancer in women in the Tricastin area. France's Nuclear Safety Authority classified  
46 the Tricastin accident as one on a scale of zero to seven. However, there were 86 level one  
47 incidents in France in 2007, and 114 in 2006.

1 **[183-10, James Vincent]** I have a photograph from page 17 of public Areva document  
2 “Nunavut Mining Symposium Iqaluit April 2009 by Peter Wollenberg ARC” about one of their  
3 operations in Canada. Even though this is a color photograph, I printed this with a black and  
4 white printer. I would like to submit this to the commission. I believe the conclusions are  
5 obvious, if this is supposed to be a secure Areva facility for radioactive core storage. My 5 year  
6 old grandson could scale this six foot cyclone fence.  
7

8 **[187-02, John Weber]** How can AREVA’s statement, in section 9.2, about protecting people  
9 and the environment from radiation be taken seriously, knowing AREVA’s dismal track record in  
10 Africa, and other parts of the world, for protecting people and the environment?  
11

12 **Response:** *These comments raise issues that are outside the scope of the EIS. As discussed*  
13 *in Section 1.4.5 of this EIS, the reputation of the applicant is an issue that is not within the scope*  
14 *of the EIS. The proposed EREF would be fully subject to the NRC regulations for uranium*  
15 *enrichment facilities, and to other applicable Federal, State, and local laws and regulations. The*  
16 *NRC evaluates the submitted license application based on its own merits and performs an*  
17 *independent verification of the proposal put forth in the applicant’s application. Further,*  
18 *pursuant to 10 CFR Part 70 and 10 CFR Part 2, respectively, the NRC will implement oversight*  
19 *(inspection) and enforcement programs during construction, operation, and decommissioning of*  
20 *the proposed EREF to assure safe functions and compliance with NRC requirements.*  
21

22  
23 **Comment:** The following comments raise the issue of AREVA’s financial stability and/or the  
24 availability of funds to ensure that the proposed EREF site is cleaned up properly.  
25

26 **[008-04, Carol Bachelder]** And they say, oh, well, AREVA will be, you know, totally  
27 responsible for the expenses. But this is based on projected earnings, like so many businesses  
28 do. You know, you plan to pay your loans out of how much money you make. There aren’t any  
29 guarantees for this, are there? The economic times, and being what they are. I just don’t see  
30 that even the promise of jobs is enough to sell me on the feasibility of this plant.  
31

32 **[028-02, David Coney]** Because the risk is so high, I’m going to ask AREVA to front the  
33 money, prove it to us that you’re sincere. Invest in Idaho. Back your play with money. If I go  
34 down to the bank, they’re going to say, where’s your money, buddy? I would ask AREVA to do  
35 it, and if I can do it with five bucks to get a loan, they can do it with 5 billion, or 5 trillion, if they’re  
36 sincere about what they’re bringing to the table. Now I would also ask them to prove to us that  
37 they can be the best steward, and invest in Idaho, before they ask anything of us.  
38

39 **[050-12, Joanie Fauci]** The NRC and the license agreement, if it occurs, should have specific  
40 requirements for Areva, its owners, its stockholders, and the government under which it falls,  
41 with regards to financial responsibility. This should cover all expenses, above and beyond. It  
42 should cover all legal possibilities should the Areva corporation dissolve or go bankrupt before  
43 all waste is removed from the Idaho site.  
44

45 **[070-01, Virginia Hemingway]** On to Areva, because I have such a limited amount of time,  
46 that company had 6.2 billion euros in net debt at the end of 2009, and as recently as June 4 of  
47 2010, it has been downgraded by Standard & Poor’s to a debt rating of BBB plus, due to its  
48 weakened profitability.  
49

1 **[078-01, Hon. Wendy Jaquet]** As a member of the legislature at the time that the tax  
2 exemptions were being considered (and I voted “no”) I had concerns about the financial viability  
3 of the company.  
4

5 **[083-05, Diane Jones]** How can we expect the company to -- whose financial future is  
6 uncertain, to be able to guarantee that they will bear the cost of treating all that waste and  
7 disposing of all that waste, when the process for disposing of the waste is not even known?  
8 This seems highly reckless to me, and not a very sound economical calculation.  
9

10 **[106-02, Ted McConaughey]** So, once again, I don’t want to come down, either for or against  
11 the facility under consideration here, but I would like to say that the EIS itself ought to address  
12 the possibility of failure at all stages, and have backup plans for funding whatever kind of  
13 cleanup and disposal might be necessary, and that should be part of the environmental costs. I  
14 mean, this is a very big environmental issue, if one of these facilities fail, as many of our nuclear  
15 facilities have.  
16

17 **[147-09, Joey Schueler]** 5. Areva’s financial stability and history of ethics is unclear. Varied  
18 opinions range from sound to on the verge of bankrupt and no clear agreements have been  
19 made ensuring that they will do right by Idaho if this project fails (reference the BP oil spill for a  
20 comparative potential scenario).  
21

22 **[154-02, Diana Shipley]** They are asking for loan guarantees from the United States  
23 government and I wonder who will be left to clean up the waste and pay the bills if they bail out?  
24 The answer is fairly obvious. We will be left holding the very unpleasant bag of troubles and if  
25 you haven’t heard, AREVA is experiencing financial difficulties. We do not need to be the ones  
26 to bail them out even though they are promising jobs, and wining and dining Idahoans in an  
27 attempt to blind those Idahoans to the simple fact that they will not be doing us any favors in the  
28 long run by contaminating our desert and leaving our communities with one toxic bill to pay.  
29

30 **[180-03, Kaye Turner]** Is it true this French company is being heavily subsidized by the French  
31 government and is otherwise in serious financial trouble? Is it true if the French and the  
32 U.S. governments stopped propping up Areva financially it would go under?  
33

34 **Response:** *NRC regulations in 10 CFR Part 70 require license applicants to be financially*  
35 *qualified to safely construct, operate, and decommission their proposed facilities. These*  
36 *regulations apply to AES’s application for the proposed EREF. However, the financial*  
37 *verification process is outside the scope of this EIS and is conducted by the NRC in conjunction*  
38 *with the safety review.*  
39

40  
41 **Comment:** The following comments express the concern that construction and operation of the  
42 proposed EREF may be too risky and dangerous. Some of these comments also express  
43 general opposition to the proposed EREF project.  
44

45 **[001-01, Reham Aarti]** I think the risks are absolutely ridiculous, considering what the benefits  
46 are going to be. I know people are worried about jobs, and they want more jobs in Idaho, and  
47 everything. But I’m sorry, it’s not worth it, it’s not worth, you know, our children being in danger. I  
48 mean, accidents happen all the time. Fires happen all the time. It’s not worth it, in the least bit,



1 and I know you guys do your job and everything's supposed to be really safe, but that doesn't  
2 mitigate, you know, human error and everything else.

3  
4 **[009-01, Steve Barclay; 013-01, Kit Blackburn; 018-01, Deb Brown; 021-01, Linda**  
5 **Cannarozzo; 029-01, Richard Conner; 035-01, Stephen Crowley; 055-01, Claudia Galaviz;**  
6 **056-01, Mark Galaviz; 063-01, Martha Haga; 081-01, Lea Johnson; 093-01, Louis Landry;**  
7 **099-01, Brent Mathieu; 100-06, Wendy Matson; 101-01, Jody May-Chang; 109-01, Eugene**  
8 **McVey; 117-01, Richard Morgan; 121-01, Jennifer Nordstrom; 161-01, Marisa Smith;**  
9 **188-01, Lana Weber-Wells; 199-01, Dina Bond; 200-01, Sean Campbell; 201-01, Giovanna**  
10 **Campos; 202-01, Alison Duffin; 203-01, Danielle Dugge; 204-01, Susan Filkins; 205-01,**  
11 **Andrea Guerri; 206-01, Pamela Hanson; 207-01, Drew Harris; 208-01, Emily Harvey;**  
12 **209-01, Courtney Hollar; 210-01, Tyler Hoovis; 211-01, Olivia Joelson; 212-01, Naomi**  
13 **Johnson; 213-01, Darvel Jones; 214-01, Jacob King; 215-01, Verlyn Larsen; 216-01,**  
14 **Beau Lee; 217-01, Jodie Mckelvey; 218-01, David Minick; 219-01, Neil Miyaoka; 220-01,**  
15 **Tim Naftzger; 221-01, Mike Perrington; 222-01, Hannah Raines; 223-01, Mason Richens;**  
16 **224-01, A. Rolsen; 225-01, Lisa Stimpson; 226-01, Jessica Toinga; 227-01, Joseph Voss]**

17 This enrichment factory:

- 18
- 19 • Is unnecessary
- 20 • Poses a risk to Idaho's natural resources and people
- 21 • Should not be licensed
- 22

23 **[022-01, Judy Carroll]** I am strongly opposed to Areva's plan to build a plant here because I do  
24 not believe that the radioactive waste will be handled appropriately and taken out of Idaho.  
25 Areva is taking advantage of Idaho in the fact that the unemployed and poor need jobs. What  
26 they don't say is that Areva will also be bringing sickness and death to Idaho. We may seem like  
27 a simple people but we do know in this state how important clean water and land are to our way  
28 of life. Idahoans are the ones who are able to enjoy beautiful wilderness, rivers and wildlife. If  
29 Areva needs uranium enriched, let them enrich it in France!

30  
31 **[106-01, Ted McConaughy]** And I think that the point of all this is that things aren't going very  
32 well. Our best-laid plans are "gang aft agley," I guess is the word, and because our record on  
33 completing our project, our nuclear projects, is rather poor, and we don't have a very good way  
34 of demonstrating that we actually can carry out these projects for the entire lifetime of the  
35 project, including the nuclear fuel, the waste reprocessing, or waste disposal, I think that to  
36 suggest that a 30 year lifetime of the plant is very optimistic, and that the nuclear fuel cycle itself  
37 is - we make all kinds of optimistic projections here, which are very hard to ensure.

38  
39 **[112-01, Mark Menlove]** I am writing to express my strong concern with the draft  
40 Environmental Impact Statement for the Eagle Rock Enrichment Facility proposed in eastern  
41 Idaho (NUREG-1945 draft).

42  
43 In my view the enrichment factory poses a risk to the people and natural resources of Idaho, is  
44 unnecessary, and should not be licensed.

45  
46 **[113-09, Ken Miller]** So there is no reason for Idaho, of all places, to be sacrificed for a fuel  
47 production factory for a generation resource that Idaho and our region do not need.

48

1 **[118-01, Caroline Morris]** The EREF is unnecessary, presents risks to Idaho's natural  
2 resources and people, and should not be licensed. I oppose the EREF's licensing.... Please  
3 consider my concerns and adjust the draft EIS, or deny the license.  
4

5 **[120-04, Frank Nicholson]** This enrichment factory:...

6  
7 • Poses a risk to Idaho's natural resources and people. If something were to happen and when  
8 the plant is shutdown a foreign company does NOT have the incentive to do what is right. They  
9 can leave and we have no recourse. BP is a great example. Also, importing and exporting the  
10 nuclear fuel will not only put ourselves at risk but many others along the path.  
11

12 **[125-02, Holly Paquette]** And so the main thing that I want to tell you is that most of the people  
13 who have come in here today, and have supported AREVA, and said that Idaho needs AREVA,  
14 have been talking about money, and that seems to be the underlying basis for why they're  
15 supporting AREVA. And having introduced myself and my background, I want to tell you --  
16 sorry, I'm a little emotional about this -- no amount of money is worth risking the environment or  
17 the safety of the people of Idaho, and that includes the next generation of Idahoans.  
18

19 **[144-01, Sara Rodgers]** This letter is in opposition to the licensing of the Eagle Rock  
20 Enrichment Facility and to suggest that the draft EIS for the EREF is inadequate. Current lives  
21 and many future lives are at risk and at stake in the licensing for one corporation. I urge you to  
22 not license the Eagle Rock Enrichment Facility nor adopt the draft EIS.  
23

24 **[150-09, Katie SeEVERS]** The potentially devastating health, environmental, and economic  
25 effects to Idaho, that the licensing of the AREVA facility presents make me say that the rejection  
26 of the licensing of this facility is in the best interest of our state and its citizens.  
27

28 **[153-01, Andrea Shipley; 197-01, Andrea Shipley, on behalf of the Snake River Alliance]**  
29 AREVA's proposed uranium enrichment factory will store radioactive waste above the sole  
30 source aquifer for nearly 300,000 people, impact sensitive species, support transport of  
31 radioactive materials into and out of Idaho, impact the Hell's Half Acre national monument,  
32 support destruction of the John Leopard Homestead, which has been recommended for the  
33 National Register of Historical Places, enjoy billions in state and federal largesse, and utilize  
34 farmland that is potentially protected by the federal government. The Alliance is here to say it's  
35 not worth the risk  
36

37 **[184-06, Kitty Vincent]** The idea that this will boost the economy of Idaho is short sighted.

38  
39 Affected could be the lives of the future citizens in Idaho and the West.

40  
41 I strongly suggest that the Areva enrichment plant be denied a license. Idaho Falls needs to  
42 develop other avenues to enhance its economy, in ways that do not threaten the people who  
43 live there for hundreds of years to come as well as a major water source of the western United  
44 States.  
45

46 **[184-07, Kitty Vincent]** Areva's proposed Eagle Rock Enrichment Facility (EREF) will store  
47 radioactive waste above the sole source aquifer for nearly 300,000 people; impact sensitive  
48 species; require the transport of radioactive materials; impair the Hell's Half Acre National

1 Monument; support destruction of the John Leopard homestead, which has been recommended  
2 for the National Register of Historic Places; devour billions of dollars in state and federal  
3 largess; and obliterate farmland that is potentially protected by the federal government. The  
4 Alliance is here to say it is not worth the risk.

5  
6 **[192-01, Lisa Young]** As a member of the scientific community, and as a member and leader of  
7 many organizations on campus and in the community, I can say that this proposal is irrational,  
8 unnecessary, and a threat to the health, safety, environment, and tax dollars of all Idahoans.

9  
10 **[192-07, Lisa Young]** Therefore, as a member of the scientific community, and as a member  
11 and leader of many organizations on campus and in the community, I can say that this proposal  
12 is irrational, unnecessary, and a threat to the health, safety, environment, and tax dollars of all  
13 Idahoans. I urge you to select the “no action” alternative when evaluating AREVA’s license  
14 application.

15  
16 **Response:** *The proposed EREF would be licensed only if the Commission finds that public*  
17 *health and safety and the environment would be adequately protected. In reviewing all of the*  
18 *comments received on the Draft EIS, the NRC staff has determined that no information has*  
19 *been provided in these comments that would change the findings and conclusions regarding*  
20 *environmental impacts in the Draft EIS. Safety issues are not within the scope of the EIS and*  
21 *are addressed in the NRC’s SER (NRC, 2010b).*

## 22 23 24 **I.5.2 General Support for the Project**

25  
26 The comments addressed in this subsection are those that are limited to expressing support in  
27 some manner for the proposed EREF project. However, comments that contain general support  
28 statements and also include topics that are relevant to issues addressed within the scope of the  
29 EIS are not included in this subsection, but are instead included and addressed elsewhere in  
30 Section I.5, in the subsections relevant to the specific topics discussed.

31  
32 **Comment:** The following comment supports the construction of transmission lines.

33  
34 **[171-02, John Tanner]** As far as transmission lines are concerned, if we couldn’t build  
35 transmission lines because of environmental impacts, we certainly couldn’t have wind farms,  
36 because they need transmission lines in spades.

37  
38 **Response:** *The NRC appreciates this comment and the public participation.*

39  
40  
41 **Comment:** The following comments express general support for the proposed EREF project.

42  
43 **[005-01, Anonymous]** I support the EIS.

44  
45 **[006-01, Anonymous]** I am supportive of the AREVA project but would like to have heard more  
46 from the NRC on how waste from the process will be stored and ultimately disposed of.

1 **[007-004, Arnold Ayers]** And for those things, we ought to be considering, and building this  
2 facility as fast as we can build it.  
3

4 **[024-01, Jana Chalfant; 149-01, Wendi Secrist; 196-01, Linda Martin, on behalf of the**  
5 **Idaho Economic Development Association]** The Idaho Economic Development Association  
6 is grateful for the opportunity to show our support for the AREVA Project. IEDA represents over  
7 seventy-five economic development professionals throughout the State. We have supported the  
8 AREVA project from its beginning during the site selection phase with the Department of  
9 Commerce, in several areas across the state.  
10

11 We supported the legislation which positioned Idaho to ultimately become the site chosen for  
12 the project. This was healthy economic legislation which provided for earned benefits for  
13 performance, not only for the AREVA project, but *any* company that would present similar  
14 investments in Idaho.  
15

16 **[052-01, Rod Fuger]** Idaho wants and needs this project.  
17

18 **[059-02, Lance Giles]** Official comment - Support licensing of facility.  
19

20 **[058-01, Matt Gerber]** We need this for the country. Areva is good for us all.  
21

22 **[065-03, Hon. Ida Hardcastle]** I appreciate being able to voice the support of myself and the  
23 many residents, who I believe are the most pro-nuclear community in the country, that AREVA  
24 be issued a license to begin construction and move forward with this very important facility to  
25 this area as well as the entire nation.  
26

27 **[079-01, Kristen Jensen; 179-01, Jolie Turek; 194-01, Linda Martin, on behalf of the**  
28 **Eastern Idaho Economic Development Partners]** On behalf of the Eastern Idaho Economic  
29 Development Partners (EIEDP) we wish to express support for the AREVA project. The EIEDP  
30 represents a 13-county area surrounding the Eagle Rock Enrichment plant location, which is in  
31 the effective immediate impact area for the project. We have issued previous letters of support  
32 for the project.  
33

34 **[090-01, Paul Kjellander, on behalf of Hon. Butch Otter; 123-01, Hon. Jeff Thompson, on**  
35 **behalf of Hon. Butch Otter]** As such, the governor wants to state his support for the proposed  
36 AREVA facility, Eagle Rock, which will be built and operated outside of Idaho Falls.  
37

38 In conclusion, the Governor would strongly encourage the Nuclear Regulatory Commission to  
39 move forward expeditiously in the review and granting of a license to AREVA so that this  
40 important facility can begin construction next year.  
41

42 **[137-05, Ralph Reeves]** I urge that this uranium low enrichment plant be approved  
43

44 **[143-04, Hon. James Risch; 172-04, Amy Taylor, on behalf of Hon. James Risch]** In  
45 closing, I support AREVA's application for the Eagle Rock Enrichment Facility, and recognize  
46 the enormous positive impact they will have for our country, state, and local citizens.  
47

1 **[145-05, Ann Rydalch]** I encourage you to follow the preliminary recommendation that AREVA  
2 be issued a license to construct and operate the Eagle Rock Enrichment Facility here in  
3 Bonneville County, Idaho Falls, Idaho, formerly called Eagle Rock, Idaho  
4

5 **[158-01, Hon. Mike Simpson; 139-01, John Revier, on behalf of Hon. Mike Simpson]** I'm  
6 writing today to express my strong support for AREVA's license application to construct and  
7 operate the Eagle Rock facility. I'm sorry I cannot join you at the public hearings in Idaho Falls and  
8 Boise, but I'd like to welcome the NRC to Idaho, and express my appreciation for the NRC's work  
9 on this important matter.

10  
11 **[160-01, Jeff Smith]** We fully support the need and the purpose of this EIS. I represent some  
12 600 members and their families. We not only feel this is good for Local 449, but Idaho, but for  
13 America and its future.  
14

15 **[167-02, Andrew Stevenson]** Because of the effort made by both the NRC and AREVA, we  
16 would like to, as a Council, voice our approval of the Environmental Impact Statement in its current  
17 form, and urge the NRC to continue on to the next step in the process of getting this project a  
18 reality.  
19

20 **[166-01, Allen Stears]** I am writing in regards to the Areva EIS. It is my opinion that enough  
21 safety procedures will be in place to protect the environment. Therefore I am in favor of granting of  
22 a permit.  
23

24 **[170-01, David Strobel]** I support Areva building an Enrichment Plant west of Idaho Falls, ID.  
25 The benefit will far outweigh the risk.  
26

27 **[176-05, Hon. Jeff Thompson]** I am pleased to give my support to AREVA, and agree with the  
28 NRC recommendation to issue a license to AREVA to construct and operate the Eagle Rock  
29 Enrichment Facility.  
30

31 **Response:** *The NRC staff acknowledges these comments and appreciates the public*  
32 *participation. However, these comments are not within the scope of the EIS analysis because*  
33 *they do not relate to the content of the Draft EIS.*  
34  
35

36 **Comment:** The following comments express concern regarding possible misinformation that  
37 has been put forth by various parties about the proposed EREF project and about the nuclear  
38 power industry in general.  
39

40 **[076-02, Martin Huebner]** If it's true, as we previously stated in Boise, that the Snake River  
41 Alliance now is a research organization, that implies that maybe the Snake River Alliance has  
42 dumped the precautionary principle, and now embraced the facts-based scientific principle. If  
43 that is not the case, I sincerely hope that Snake River Alliance objectively looks at the facts, and  
44 comes to the conclusion that most of us here already have, that safe, reliable, economical,  
45 carbon-free nuclear power must be, and will be a vital part of America's future.  
46



1 **[082-02, Michael Johnston]** There are a couple of groups here in the area, Snake River  
2 Alliance and (?) Keep Yellowstone Nuclear Free, that try to misrepresent and distort the truth. I  
3 have seen where they represent a small but very vocal group and generally turn out larger  
4 groups of anti-nuclear people. I along with a lot of others here are normally very low key, quiet,  
5 supportive of the INL and nuclear power, and sorry to say do not go to these meetings. This  
6 morning I had breakfast with about 18 of these people and do not believe any of them will be at  
7 the meeting to show their support. I think they assume you will know the true facts regarding  
8 environmental and safety factors to discount what these antinuclear groups represent and/or  
9 distort. How can one believe with a INL workforce here there is not great support for the nuclear  
10 industry.

11  
12 **[157-11, Hon. Erik Simpson]** Risk. At the Boise hearing, those opposed asked the NRC panel  
13 if they could guarantee there would be no mishaps at the Eagle Rock Enrichment Facility. I  
14 came to the conclusion that even if the NRC could ensure the public there would be no  
15 problems at the facility, those who are opposed to this project would still be opposed. After all,  
16 it's nuclear.

17  
18 **[173-01, David Taylor]** ...I am strongly in favor of the construction and maintenance of the  
19 Areva complex and hope the rest of the DOE INL site can be used for productive nuclear  
20 research and generating capacity....

21  
22 We cannot supplant the energy from fossil fuels to the electric grid without vast improvements to  
23 the grid itself and to generating capacity. Nuclear is the only viable alternative and the only one  
24 that is "eco friendly" to the environment. Fear mongers and professional detractors "Snake River  
25 Alliance" use disgraceful tactics and words in attempting to keep their little source of revenue  
26 alive.

27  
28 We possess the technology (Gen IV reactors) and now need the common sense to use these  
29 resources to help sustain a vibrant economy and standard of living that we have all come to  
30 expect. The next generation will not have these opportunities if we squander and make feeble  
31 attempts to make nuclear energy production a reality now.

32  
33 I support Areva and the ideas that surround using nuclear technology as a great national effort.  
34 It must be for national security and for economic security. We must have a federal government  
35 that will establish certain protocols and reactor templates that if complied with will move to a fast  
36 track for licensing and construction. From there the government must run interference against  
37 all the special interest that come to bear only for the reason of capital extraction. Thanks for  
38 allowing us to be part of this potentially wonderful venture that will not only bless the lives of  
39 those who live and work here but for the whole nation.

40  
41 **Response:** *In the EIS, the NRC staff provides an objective analysis of the potential*  
42 *environmental impacts in all resource areas, based on NEPA and the NRC regulations for*  
43 *implementing NEPA in 10 CFR Part 51. The NRC staff has followed these requirements and*  
44 *has independently evaluated the information used for, and presented in, the EIS.*

45  
46  
47 **Comment:** The following comments support the development of the proposed EREF and point  
48 out that Idaho is the proper location for such a facility and that the proposed facility can be

1 operated safely, based on the technical capability and experience of the workforce in the project  
2 area and on local environmental and legal/regulatory factors. Some of these comments also  
3 express general support for the project.  
4

5 **[003-01, Philip Anderson]** This is to express *support* for the proposed Eagle Rock Enrichment  
6 Facility near Idaho Falls, Idaho.  
7

8 In addition, I want to draw your attention to the population demographics of eastern Idaho which  
9 show that one of the highest concentrations of scientists and engineers in the nation already live  
10 in this relatively lightly populated region. Therefore, public support of the project and its  
11 technology would be among the most positive in the nation.  
12

13 Specifically, because a substantial fraction of this population has the educational and  
14 professional advantage of *understanding* nuclear technologies, organized opposition to the  
15 project should be less than in other regions. One would expect the superstitious fears of and  
16 opposition to “everything nuclear” to be less than in other regions, and any that might be  
17 expressed in eastern Idaho can be answered or explained locally.  
18

19 **[038-03, Brian Davidson]** Eastern Idaho’s long history with nuclear research and its current  
20 safety-minded workforce are a strong reason to support Areva’s plant in our area. We have  
21 proved time and again that not only can we operate such technology safely, but we also have  
22 the commitment to ensure generated wastes are dealt with safely.  
23

24 **[043-01, Rocky Deschamps]** I am going to speak just a little bit, and I won’t take much time.  
25 I’m going to talk a little bit about, I spent six years on the Bingham County Planning and Zoning  
26 Commission, the last two years as chairman of that Commission, and there’s one area here on  
27 the Environmental Impact Statement that I’d just like to maybe touch just a little bit of base on,  
28 and it talks about, it’s anticipated the number of workers moving into the area during each phase  
29 of the proposed project they call them migration workers, that might have some impact on the  
30 schools, health care, law enforcement, availability, cost of public utilities, such as electric, water,  
31 sanitary, road, number of migrating workers expected during the construction and operations  
32 might impact the housing.  
33

34 My time on the Bingham County Planning and Zoning, we encourage businesses because our  
35 schools are crying out, we need more students. We’re actually declining in our number of youth  
36 in our schools. Our roads are very adequate. Our schools are adequate. We have an  
37 infrastructure here in southeast Idaho because we are so used to having INL, we have the  
38 colleges here that can train the workers. We have the high schools that are there that are ready  
39 to accept anything new that we might have in this area in the schools. We have multiple,  
40 multiple infrastructure in place because of the INL, and the experience we have with the INL out  
41 there.  
42

43 Also, I’ve been involved with the supply side. We have contractors in this area that are so  
44 familiar with the requirements to build a facility like this, that it’s just -- you don’t find that in a lot  
45 of areas. We also have suppliers that are used to supplying the specifications, the ASTM  
46 specifications that are required on a nuclear facility to do that, so we are very able to take on a  
47 facility like this, and take care of it, and do what we need to do.  
48

1 **[065-02, Hon. Ida Hardcastle]** I spend a large amount of time in the city among the residents  
2 and it is exciting to feel the enthusiasm most have for this project coming to Idaho Falls. Of  
3 course the main interest is the economic impact it will have on the area, in other words - jobs.  
4 Also the community supports the fact that there will be a very small environmental impact from  
5 this facility. We thank the NRC again for their efforts in this particular concern. We have a top  
6 notch workforce here which was recognized by AREVA in the beginning. The community as a  
7 whole supports energy being produced by nuclear power. We simply have to address our  
8 independence on foreign oil.

9  
10 **[094-03, Michael Lange]** One of the things that they don't cover in NEPA is the biggest single  
11 issue of safety, of building any plant in this country, whether you like coal, or nuclear, whatever,  
12 and that's the quality of the people that build the plant. It's the skill level of the people that build  
13 the plant. It's the safety training of the people that build the plant. And I can say that in Idaho,  
14 the times I've worked here, and the people I worked with, you have very highly-trained people,  
15 very safe people, very professional people that work hard. And I can tell you from working in  
16 those facilities under those rules, and the NRC Commissioners would be the first to tell you, if  
17 you've ever worked in a hot mockup on a nuclear plant, you've got 3 R next to you about a few  
18 feet away, you better be doing it right.

19  
20 **[111-02, Robert Meikle]** And Idaho Falls is one of the places that has 40 years of experience  
21 doing this sort of thing. And I've been there for 40 years. My first construction company put the  
22 seven big tanks in at CPP, at the Idaho Nuclear Engineering Laboratory, and I was still in  
23 business 40 years later, and we took those same tanks out.

24  
25 **[133-02, Richard Provencher]** Relative to the potential environmental impacts, this is a perfect  
26 fit nuclear facility to locate in Idaho. ... Overall, this appears to be a facility that affords much  
27 benefit to the country and Idaho Falls that far outweighs the low risk and low potential for  
28 environmental impact and I am fully supportive of NRC granting a license to construct and  
29 operate.

30  
31 **[135-04, Hon. Dave Radford]** Being a political subdivision of the State of Idaho, Bonneville  
32 County adopted a comprehensive plan that included located nuclear growth west of -- on the  
33 western side of -- Bonneville County, so we think that will help expedite the process. We, as the  
34 commission, agree with the Environmental Impact Statement's conclusion.

35  
36 Historically, I serve on the Heritage Commission. I think history is important, that homestead, I  
37 think, could be mitigated out there. Historically, Bonneville County, my predecessors at the  
38 County Commission, took very limited resources in terms of property tax dollars and invested  
39 them in improved roads to get out to the site 60 years ago. So, historically, we've been a  
40 nuclear-friendly county, and I believe that it will continue. And we applaud your work, we respect  
41 your work, and we hope for a great outcome for an expedited license for AREVA.

42  
43 **[151-03, Beth Sellers]** The fact that Areva Enrichment *Services* selected Idaho Falls as the  
44 location to construct and operate this enrichment facility speaks to the comfort level this  
45 community has with all things nuclear. There are over 6 decades of nuclear energy R&D&D  
46 experience at the INL. Locating a commercial capability next door makes logical sense, as the  
47 synergy that will co-exist in the professional arena will be a natural outcome and provide benefit  
48 to all involved.

1 **[152-01, Steven Serr]** I am also responsible for code compliance conformance for building  
2 code, fire code, mechanical code, flood plain rules and regulations. And I have had an  
3 opportunity to work with NRC staff. They've been in my office asking questions as to what we  
4 figure impacts are, how we plan on addressing issues, if we have concerns on implementation  
5 of this project. We've worked extensively with AREVA, and their staff, to make sure everything  
6 that they are doing would be in compliance with NRC guidelines, with local rules and  
7 regulations, and they've made every attempt to make adjustments to their plan, to make sure  
8 that we have a safe facility.

9  
10 **[152-03, Steven Serr]** As far as compliance with zoning rules and regulations, that area was  
11 designed specifically for this type of facility. It's not designed to have other uses out there that  
12 could be impacted by those uses.

13  
14 **[152-07, Steven Serr]** One of the issues we were concerned, we talked specifically about, was  
15 the storage facilities on site, to make sure that those are contained. We feel that the plan that  
16 they have implemented for on-site retention containment, lined ponds, monitoring would  
17 adequately protect the community. As far as code enforcement officers, that one of my major  
18 charges, is any facility we have come in, that we do see that they are fully code compliant and  
19 protect the public health, safety, and welfare of the community.

20  
21 **[152-09, Steven Serr]** I wanted to address the issue as to the suitability of this property for  
22 development of that site. Again, as the Commissioner mentioned earlier, this area has been  
23 zoned and designated for this type of use. It's been planned that it could accommodate this type  
24 of operation since 1960. So, it's been a long-designated piece of property, tract of land out there  
25 for this type of use.

26  
27 I approach this as an enforcement site for any facility that's built in the county. Our concern in  
28 the county is making sure that things are built to code, built complaint, built safe, protect public  
29 health, safety, and welfare. My office, we are responsible for enforcement of the building code,  
30 the fire code, mechanical code, flood plain rules and regulations, and we have addressed most  
31 of these issues with AREVA. We've made modifications for some of their design issues on what  
32 they contemplate doing to try to mitigate, and make sure that the operation that they're  
33 proposing out there will be a safe compliant operation.

34  
35 **Response:** *The NRC staff acknowledges these comments and appreciates the public*  
36 *participation. However, these comments are outside the scope of the EIS analysis because*  
37 *they do not relate to the content of the Draft EIS.*

38  
39  
40 **Comment:** The following comments express support for the proposed EREF and state that the  
41 operations at the EREF are expected to be safe and environmentally responsible because  
42 operations would be based on a proven technology. Some of these comments cite the safety of  
43 the nuclear industry as a whole.

44  
45 **[039-02, Kreg Davis]** First. The project is environmentally responsible. It is tested. It is proven  
46 technology. I think most people agree that we need safe, clean, secure, and abundant base  
47 power, baseload power. This baseload power argument has not been discussed as much as I  
48 think it should be tonight.

1 My business is very grateful for the business we get from wind and solar, and would continue to  
2 hope those sectors expand, and at a rapid rate.

3  
4 However, neither one of those provide baseload power. Nuclear can. In my opinion, AREVA's  
5 project complements these important energy goals. I also believe that serious thinkers on this  
6 issue agree -- nuclear power is the only technology able to deliver on all of these dimensions. I  
7 acknowledge that there are reasonable people who have safety concerns, but most of those I  
8 have spoken with, that oppose nuclear power, believe nuclear safety is possible. However,  
9 there are those that let anxieties rule. Their doubts lead to fight against any implementation of  
10 nuclear power. I personally believe that we are better to focus on growing a safe, clean, secure,  
11 and abundant nuclear industry.

12  
13 **[039-05, Kreg Davis]** First, this project is environmentally responsible. It is tested. It is proven  
14 technology. I think most people agree that we need safe, clean, secure, and abundant base-  
15 load power. In my opinion, Areva's project complements these important energy goals. I also  
16 believe that serious thinkers on this issue agree nuclear power is the only technology able to  
17 deliver on all of these dimensions. I acknowledge that there are reasonable people who have  
18 safety concerns, but most of those I have spoken with that oppose nuclear power believe  
19 nuclear safety is possible. However, there are those that let anxieties rule. Their doubts lead to  
20 fight against any implementation of nuclear power. I personally believe that we are all better to  
21 focus on growing a safe, clean, secure and abundant nuclear industry.

22  
23 **[043-02, Rocky Deschamps]** The last thing that I was -- I'll just touch base on, and I'll touch it  
24 very briefly, and that is, is that it's too bad that in this day and age that we treat nuclear power  
25 the way we do. And I've gone through the Environmental Impact Statement, I didn't see  
26 anything that touched on this. And the only figures that I have with it, on my note here, in 2006, I  
27 don't have it. In 2006, there was 46 miners killed in coal mining accidents. If that would happen  
28 in the nuclear industry, it would be shut down so fast, but coal is just left kind of as it is. So, I  
29 think that we need to look at that a little bit and say geez, where -- I think that 2006 is probably a  
30 pretty good year. If we looked at 2009, or 2008, it would even be worse, so I think we need to  
31 take in a little bit of perspective, and look at that.

32  
33 **[098-04, Linda Martin]** As far as technical impacts, the centrifuge technology is proven and  
34 safe as based on other facilities across the world, and while there conceivably is a significant  
35 gap in the supply-demand equation for enriched uranium to provide our current and future green  
36 energy needs, we can address that with the EREF.

37  
38 **[098-11, Linda Martin]** The company's use of centrifuge technology is a proven, safe method  
39 of enriching uranium. This technology is more energy efficient, more environmentally friendly  
40 and less expensive to operate than the other accepted uranium enrichment process called  
41 gaseous diffusion.

42  
43 **[116-01, Richard Mondy]** I am in full support of the proposed Eagle Rock enrichment facility.

44  
45 I submit that nuclear power is as safe, if not safer, than petroleum based power. Opponents to  
46 the facility neglect to admit the hazards of alternative sources, hazards such as the recent Gulf  
47 oil spill.



1 It is easy for those with other agendas to be opposed when they can take a narrow view and  
2 just 'cry wolf' without having to offer and substantiate a realistic alternative.

3  
4 **[123-02, Hon. Butch Otter; 090-02, Paul Kjellander, on behalf of Hon. Butch Otter; 195-02,**  
5 **Hon. Jeff Thompson, on behalf of Hon. Butch Otter]** AREVA is proposing to build a state-of  
6 the-art, technologically-proven, modern facility to enrich uranium needed to operate the existing  
7 U.S. fleet of 104 power reactors. AREVA's plant will incorporate many unique features which  
8 have been developed over three decades of experience with centrifuge enrichment technology.  
9 AREVA's vast experience and use of the technology will result in minimizing and, where  
10 possible, eliminating any impacts on the surrounding environment and regional communities,  
11 but there will remain, however, many significant beneficial impacts....

12  
13 Safety, integrity, professionalism, and sustainability are demonstrated attributes that AREVA  
14 embraces in all of its projects and operations, and the Governor believes they'll bring no less to  
15 Idaho Falls. AREVA has been easy to work with, and they are as excited about coming to Idaho  
16 as we are to have them locate their facility here.

17  
18 As we look across the country today, there are not many, if any, states or regions that can claim  
19 proposed major energy construction projects or facilities like the Eagle Rock Enrichment  
20 Facility. While large projects are usually accompanied by some environmental impacts,  
21 Governor Otter believes the end result of this facility will be very positive for Idaho and the  
22 country. Eagle Rock will provide much needed domestic production of enriched uranium for our  
23 existing U.S. nuclear power fleet, which will help enable U.S. utilities to move away from  
24 importing nearly 90 percent of this important fuel product.

25  
26 **[137-02, Ralph Reeves]** 2. The nuclear industry has a great safety record. Then there is oil  
27 drilling, coal mining, etc.

28  
29 **[143-03, Hon. James Risch; 172-03, Amy Taylor, on behalf of Hon. James Risch]** I also  
30 note the centrifuge technology is proven, reliable, and efficient. The process will use 50 times  
31 less electricity than a gaseous diffusion plant, and the amount of water used by the plant is less  
32 than the current irrigation appropriation.

33  
34 **[128-02, Bob Poyser]** In addition, the Eagle Rock enrichment facility will provide safe and  
35 secure domestic enrichment services that American utilities need to generate carbon-free  
36 energy.

37  
38 **[163-04, Cindy Smith-Putnam]** Over the past five years, approximately a million and a half  
39 Americans have died from smoking, automobile accidents, and alcohol-related incidents.  
40 Obesity has claimed another million and a half lives over the same time period. And according  
41 to the Institute of Medicine's landmark report titled, "To Err is Human," my own industry, health  
42 care, is estimated to be responsible for the annual death of nearly 100,000 people through  
43 medical errors. By contrast, according to the Director of the Carlsbad Environmental Monitoring  
44 and Research Center, in that same period of time, the past five years, the nuclear industry has  
45 produced zero deaths, and a relative danger index of 0.0.

1 **Response:** *The NRC staff acknowledges these comments and appreciates the public*  
2 *participation. However, these comments are outside the scope of the EIS analysis because*  
3 *they do not relate to the content of the Draft EIS.*

4  
5  
6 **Comment:** The following comments express support for the role of the proposed EREF as part  
7 of the nuclear fuel cycle and/or support for nuclear power in general.

8  
9 **[010-01, Jack Barraclough]** So, when a project like this comes in my study of nuclear needs,  
10 it's just so obvious that this is what we need. You can look at all these things, and talk about the  
11 aquifer, but this is trivial compared to the needs of this country.

12  
13 ... and we don't need negativism, naysayers, we need positive support of this excellent project  
14 that would help the world, and help the country, and I strongly support this.

15  
16 **[033-01, Hon. Mike Crapo; 075-01, Leslie Huddleston, on behalf of Hon. Mike Crapo]** Now,  
17 more than ever, it is critical to develop secure, economically feasible, and clean supplies of  
18 domestic energy. EREF will supply America's existing operation fleet of nuclear power reactors,  
19 and further augment the anticipated growth of new commercial nuclear power generation here  
20 in the U.S.

21  
22 **[034-01, Greg Crockett]** While I understand this is not a debate on nuclear energy policy, the  
23 context in which decisions of this nature are made must be considered and cannot be ignored.  
24 Daily headlines demonstrate the devastating environmental consequences of our heavy  
25 dependence on petroleum fuels. Fires in Russia, floods in China and Pakistan, and oppressive  
26 heat currently being experienced within the continental United States remind us continuously of  
27 the ever-increasing consequences of climate change.

28  
29 It is time for the U.S. to change directions in the interest of our energy future and our national  
30 interest. It is time for the United States to reassume a leadership role worldwide in nuclear  
31 energy. Our national security interests require that we have enrichment and fuel development  
32 capabilities within our borders. I support the Draft Environmental Impact Statement, which  
33 likewise recognizes those demands.

34  
35 Demand for nuclear fuel is, and will dramatically increase in the future, and I think that's  
36 demonstrated by the number of pending NRC license applications. To suggest that the Eagle  
37 Rock Enrichment Facility's production is not or will not be necessary is pure folly. To meet our  
38 current demand for enriched uranium, much of it is imported, and we need robust domestic  
39 suppliers who can provide this service in an environmentally compatible manner.

40  
41 We trust AREVA. We trust that the proposed Eagle Rock facility will provide this valuable  
42 service to our nation. I support the Draft Environmental Impact Statement, and recommend that  
43 it be accepted, and that the license process proceed.

44  
45 **[038-02, Brian Davidson]** As we look to secure our nation's energy future, nuclear power has  
46 got to be a part of it. Having Areva's uranium enrichment capacity in Idaho and the  
47 United States will help nuclear power become an even more viable energy alternative.

1 **[039-04 and 039-07, Kreg Davis]** In the long run, this project will augment our base-load  
2 electrical needs. Nuclear energy is a significant part of the answer to our energy needs. I  
3 worked for Philips Semiconductors during the years when the semiconductor industry started  
4 moving jobs from the United States overseas. Countries with empty fields, cheap and abundant  
5 power, clean and plentiful water, an education program fully developed complete with a steady  
6 stream of graduates, and low taxes. These countries provided all this and an invitation to come.

7  
8 If America and Idaho are going to compete in this world, we too need to provide clean water,  
9 quality education, and reasonable taxes. But we also need to provide energy — abundant  
10 power — predictable base-load energy. I personally believe that nuclear energy should be a  
11 significant part of that base. Areva's project helps us to achieve success. This project is good  
12 for our planet and it is good for our economy. Thank you for giving me this time.

13  
14 **[041-01, Hon. Tammy de Weerd; 156-01, Robert Simison, on behalf of Hon. Tammy de**  
15 **Weerd]** I am speaking tonight on behalf of Mayor Tammy de Weerd of the City of Meridian,  
16 which is the third largest city in Idaho, located here in the Treasure Valley, in support of the  
17 purpose and need for the proposed Eagle Rock facility, as outlined in the EIS.

18  
19 We believe that the proposed facility will help support our nation's nuclear power industry and  
20 emphasize the importance of having a reliable source of enriched uranium for national energy  
21 security, as is described in the EIS....

22  
23 I think this could be a good partnership for the area. With that, I will go ahead and conclude my  
24 comments, and say, as a nation, we need a generation of safe nuclear energy power plants and  
25 we encourage you to move the EIS for the Eagle Rock facility forward, and know that it will  
26 directly and indirectly benefit thousands of Idahoans.

27  
28 **[042-01, John Deal]** We believe the Eagle Rock Facility is an important and necessary addition  
29 to the fuel cycle in America and will depend on the Eagle Rock facility for fuel enrichment.

30  
31 **[051-02, Jackie Flowers]** Something else this community is concerned about and cares about  
32 is energy. As this country grapples with visions for a sustainable energy future, and energy  
33 independence, we have to take action and stop the rhetoric. Nuclear energy provides  
34 20 percent of the nation's electricity. We've already heard that tonight. Importantly, we've also  
35 heard it provides more than 69 percent of emission-free electricity that keep the lights on in this  
36 country. Let me stress, base load emission-free energy. With less than 15 percent of the nuclear  
37 fuel supply necessary for the existing nuclear energy fleet coming from a single source inside  
38 this country's border, we have an energy security problem that I believe rallies that of our  
39 dependence on foreign oil. And this is an important step towards building that independence.

40  
41 Nuclear energy is ready now to be a central part of a balanced common-sense approach to  
42 clean energy diversity. I agree with the NRC staff's statement that this facility will contribute to  
43 the attainment of national energy security policy objectives by providing an additional reliable  
44 and economical domestic source of fuel for these important nuclear energy facilities.

45  
46 **[064-01, Hon. Tom Hally]** I support the facility as it is part of a long term solution to our energy  
47 needs. A nation we have failed to come up with a comprehensive energy policy. We all seem to  
48 agree that we need to down size coal. In my opinion nuclear is part of the solution and I feel is

1 green. We need to move forward. Idaho Falls supports the facility and as a member of the Idaho  
2 Falls city council I support the facility.

3  
4 **[065-02, Hon. Ida Hardcastle]** The community as a whole supports energy being produced by  
5 nuclear power. We simply have to address our independence on foreign oil.

6  
7 **[067-03, Mike Hart]** With respect to the need, I, looking at global warming, I know there are  
8 obviously impacts of nuclear energy, but the reality is, seven generations from now I think they  
9 won't be worrying as much about depleted uranium as they will be about depleted glaciers,  
10 depleted ice caps, and nuclear energy has a significant benefit. It's not without its warts, it's not  
11 without its impacts, but there is "no free lunch" when it comes to energy.

12  
13 You can conserve, but we do use energy. It is used globally, whether this is a French company,  
14 whether it's used locally, or nationally, the reality is its carbon-free, and that carbon-free  
15 resource is something that is very precious, and until we have alternative technologies that can  
16 produce significant usable quantities of electricity, nuclear is a very positive step in between  
17 now and a carbon-free future.

18  
19 **[067-06, Mike Hart]** Also, they took exception with the cause and need for action. I think there's  
20 most definitely a need for this, because there's a need for carbon-free energy. Throughout the  
21 world, I think we've seen that global warming is a significant problem that we need to be paying  
22 attention to, and there's also a demand for growth in nuclear energy. There's a couple of facts I  
23 want to point out why we need nuclear energy, why we need this particular enrichment plant.

24  
25 Carbon dioxide reflects, or absorbs, infrared energy that does not go back out to space. It  
26 makes the planet warmer. That's simply a fact. Carbon dioxide is a greenhouse gas. Levels of  
27 carbon dioxide have gone from 288 parts per million in 1850 to 369 parts per million in the year  
28 2000. It doesn't matter where it comes from. That is a greenhouse gas that is increasing in  
29 concentration. But I'll give you a hint as to where it's coming from: fossil energy. In 1990s, we  
30 annually contribute 6.3 gigatons of carbon dioxide into the atmosphere through fossil  
31 combustion. That's annual, 6.3 gigatons. The concern about 300,000 metric tons, 300,000 tons  
32 of total waste versus 6.3 gigatons in a single year, I view the problem with carbon as much more  
33 significant than the problem with depleted uranium.

34  
35 So, what is a gigaton? Why is that a concern? Well, 2.3 gigatons is one part per million of  
36 carbon dioxide in the atmosphere. So, every year we are steadily increasing carbon dioxide. So,  
37 yes, global warming is occurring. Yes, it's our fault. Yes, carbon puts more of that in the  
38 atmosphere, and I think nuclear energy is a stopgap that will – is worth pursuing. So, yes, there  
39 is a need.

40  
41 Energy demands are increasing worldwide. Currently, the population of the planet is about  
42 4.5 billion. By 2050, that will double, and people are not less energy consumptive. Populations  
43 like China and India used to be in the Third World. They have bought the second world, and  
44 they've placed a firm down payment on the first one. So, energy consumption will go up as the  
45 population goes up, so even if nuclear energy just holds its own at 15 percent, there will be a  
46 need for more nuclear plants, and that means there will be a need for more enriched uranium.

1 **[072-01, Stephen Herring]** Good evening, my name is Steve Herring. I am a nuclear engineer  
2 and have lived here in Idaho since earning my doctorate 31 years ago. During that time I have  
3 seen the NRC carefully exercise its duty in protecting the public health through their diligent  
4 review of proposed facilities. I would like to speak in favor of the AREVA license application for  
5 the Eagle Rock Enrichment Facility.  
6

7 This facility will be an important part of the nuclear fuel cycle and a key step in providing for  
8 future electricity. In building this facility, AREVA will replace 60-year old technology for uranium  
9 enrichment with new gas centrifuge technology that is more proliferation resistance, cleaner and  
10 a factor of twenty to fifty times more efficient.  
11

12 The 104 reactors in the US provide about 20% of total US electricity and 69% of the emission-  
13 free electricity. However, today, the US has only one operating gas centrifuge plant and the last  
14 gaseous diffusion plants are being decommissioned. The one gas centrifuge plant which began  
15 operation in New Mexico in June 2010, will be capable of producing 3 *MSWU/yr*, about 25% of  
16 the US need for enrichment. So the US is dependent on imported enrichment for 75% of its  
17 commercial fuel needs.  
18

19 We have seen the construction of many wind turbines in the hills east of Idaho Falls and through  
20 the west in the last five years. I applaud the contribution that these turbines can make, though I  
21 have yet to see any comparable contribution in Jackson or Sun Valley. But it is important to  
22 remember that turbines in the best wind sites have capacity factors of only 30-35%. The nuclear  
23 reactors fueled by means of the Eagle Rock Enrichment Facility will provide power with a  
24 capacity factor above 90%, that is, they provide more than 90% of their maximum capacity  
25 when averaged 24-7, year around. The US needs reliable, sustainable energy for decades to  
26 come, and not just when the wind is blowing.  
27

28 Thank you for the opportunity to comment.  
29

30 **[082-01, Michael Johnston]** I would like to submit my support for the proposed AREVA  
31 Enrichment Service's proposed gas centrifuge uranium enrichment plant to be built in Eagle  
32 Rock, Idaho, report number, "NUREG- 1945 draft."  
33

34 We need nuclear power and the facilities to support them. I feel this facility will be a safe asset  
35 to the overall program. I started working at the Idaho National Laboratory (INL) in 1976 and  
36 retired in 2000, I always felt safe there. One of my biggest complaints was the general US  
37 population was never provided with enough truthful educational information to know how safe  
38 Nuclear Power was and what a good source of safe power it was. I know just a little about the  
39 planning, review process, and construction overview that goes into building nuclear facilities  
40 after working at the INL and am supportive of this project.  
41

42 **[098-13, Linda Martin]** Conceivably there is a significant gap in the supply/demand equation  
43 for enriched uranium to provide for our current and future green energy needs. The uncertainty  
44 of the future supply of energy could evolve into a national security issue. The Eagle Rock  
45 Enrichment Facility would be a principal supplier for this valuable and needed material.  
46

47 **[111-01, Robert Meikle]** The issue of risk is the risk of what we don't do if we don't adopt  
48 nuclear. What are our options if we don't adopt nuclear? And so if we don't do nuclear, ten



1 years from now we'll still be doing coal. And what are the risks of coal, if we're doing coal ten  
2 years--as opposed to doing nuclear?

3  
4 And so I think you have to weigh the risks. You have to weigh them, carefully, and you have to  
5 look at all of the science, and you have to look at all of the economics. But I don't think  
6 economics should be the driver here.

7  
8 Boone Pickens made one other really great point, and I've lived in Wyoming the last few years. I  
9 understand Wyoming's economy, with coal and natural gas. But we need to go to natural gas,  
10 and if we don't go to natural gas, we're going to be in trouble.

11  
12 It's going to take all of these things. But Mr. Davis brought out what I think is the most important  
13 point that's been made in this entire hearing, and that is we have to have a baseload. We have  
14 to have a baseload that's reliable.

15  
16 I was in the ski business in 1976-77, and in that year, we did not see one storm come through  
17 from September clear through till January, and in that year wind wasn't going to do it, solar  
18 wasn't going to do it for Idaho, nor was hydro. And so we've got -- we've got to look at the "big  
19 picture" with our energy policy, and I think you're doing the right thing, although I totally agree,  
20 there are risks. But the risks, when you look at the risks and weigh them against the rewards,  
21 and our other alternatives, then we've got to move in this direction.

22  
23 **[114-01, Anne Mitchell]** Thank you for granting Areva a license to help create a clean, efficient  
24 energy source so direly needed in this country. They, of course, are a proven entity with a  
25 sterling history for safety, economy in their enrichment facilities. Our country needs this forward  
26 thinking element of clean energy and nuclear energy (so long over-looked by this country) is  
27 direly needed. I strongly appreciate the NRC's approval of Areva's license and embrace this not  
28 only for Idaho Falls, but also for my country which I love.

29  
30 **[119-01, Bob Neilson]** One of the things that's very important in this country to be looking at in  
31 these days and ages is carbon management, and because of carbon management and the  
32 issues associated with it, I'm a strong supporter of renewable energy, including biomass,  
33 geothermal, hydropower, solar and wind.

34  
35 However, for the same reason, I'm also a supporter of nuclear energy. And because I'm a  
36 supporter of nuclear energy, if you're going to have nuclear energy you have to have  
37 enrichment plants. There's no way around that.

38  
39 Now we've all talked about environmental impacts. It's an interesting, a little fact, that if you talk  
40 about life cycle analysis for a variety of energy sources, and I'm talking about from the time that  
41 you're talking about mining, through transportation, through conversion, through manufacturing,  
42 through operation, through decommissioning. That if you look at nuclear energy in terms of  
43 carbon management, it produces the same, or less, carbon dioxide on a life cycle basis than  
44 wind energy does.

45  
46 Now that doesn't say that nuclear is better or worse, or wind is better or worse. What it does  
47 say, though, is that no matter what kind of energy generation technology you're talking about,  
48 there are impacts, impacts to all of them, and those impacts need to be carefully considered, so

1 that we, as the citizens of Idaho, can make the decisions that are important to our livelihoods  
2 and the state.

3  
4 Now nuclear energy produces about 20 percent of the electrical energy in this country today. I  
5 would maintain that because nuclear is one of the few sources that's baseload compared to  
6 renewable energy for which most renewable energy is not baseload, we need to have nuclear  
7 energy, and if we need to have nuclear energy we need to have enrichment, and I'm afraid that,  
8 unfortunately, it's an important source among all the others. There's no "silver bullet." We need  
9 a mix. Nuclear is a part of that mix.

10  
11 **[123-04, Hon. Butch Otter; 090-04, Paul Kjellander, on behalf of Hon. Butch Otter; 195-04,**  
12 **Hon. Jeff Thompson, on behalf of Hon. Butch Otter]** Third, Eagle Rock will help rebuild the  
13 nation's nuclear infrastructure, and enhance energy security for all those who depend on  
14 nuclear power for their health and welfare right here from Idaho.

15  
16 **[128-01, Bob Poyser]** We welcome this opportunity to provide factual information about our  
17 project to Boise and the surrounding communities. Assuming we are granted a license next  
18 year, those in Boise, who make the trip to Idaho Falls by way of Highway 20, will see the  
19 beginning of an important step towards our nation's energy independence, the development of a  
20 significant investment in Idaho, and construction of an American facility which will provide jobs  
21 to American workers, and strength to the local economy.

22  
23 **[133-01, Richard Provencher]** I fully support the NRC's proposed preferred alternative to build  
24 a uranium enrichment plant west of Idaho Falls, Idaho. The facility being pursued by AREVA will  
25 provide an additional reliable and economical domestic source of low enriched uranium to be  
26 used in commercial nuclear power plants. Having more capability for enrichment in this country  
27 helps reduce the risk related to importation of this type of material from foreign sources. The  
28 AREVA facilities planned capacity can provide 40% of the current and planned demand for  
29 enriched uranium. AREVA's business plan fits well within the country's plan to reduce  
30 dependency on foreign oil, improve the climate, and make nuclear energy a larger contributor to  
31 the domestic energy supply. This creates a clear mandate for the capability which is critically  
32 important to beginning the review of environmental impacts related to its operation.

33  
34 **[134-01, William Quapp]** First of all, I commend the staff's preliminary conclusions, and hope  
35 that they retain those conclusions on the favorable benefit cost assessment. My only  
36 disagreement with the NRC's impact statements may be one of semantics. I believe that the  
37 risks or impacts identified shouldn't be attributed to low and moderate, but the word should be  
38 trivial. I believe those impacts are trivial compared to the impacts associated with a societal  
39 continued importation of foreign oil. I believe, furthermore, that nuclear power can provide the  
40 indigenous energy supply while employing Americans in the USA. And, in fact, I believe there is  
41 no bigger impact than sending our soldiers to support energy policy in countries of foreign, or  
42 the Middle East. So, I support the Draft EIS conclusions for the reasons that have been stated  
43 therein, but for many more societal benefits, as I see it, in use of safe and sensible use of  
44 nuclear power.

45  
46 **[135-03, Hon. Dave Radford]** And, to me, when we develop nuclear in this country, and yet we  
47 only arrive at 20 percent of our power, with French getting 80 percent of their power from  
48 nuclear, and we have an opportunity to learn some things about getting this energy on the grid,

1 so I'm optimistic that it can eventually translate to more electricity, cheaper power, a better  
2 quality of life.

3  
4 **[143-01, Hon. James Risch; 172-01, Amy Taylor, on behalf of Hon. James Risch]** As a  
5 U.S. Senator from Idaho, I have the privilege of serving as the Ranking Member of the  
6 Subcommittee on Energy. From that position, I have seen firsthand the efforts this country is  
7 making to formulate a forward-looking energy policy. Supporting nuclear power, and its  
8 associated technologies, such as enrichment, is one way to make our country more energy  
9 secure.

10  
11 Years of broken energy policy have led us to become dependent on foreign sources of energy.  
12 We've also lost our competitive edge in the nuclear field, a field where the United States and  
13 Idaho once led. This community knows what it takes to regain that competitive edge, and once  
14 again place Idaho and this nation at the pinnacle of the nuclear industry.

15  
16 There is a growing recognition that nuclear power is the most viable option to meet the clean  
17 energy demands of the future. Demand for enriched uranium is increasing in the United States  
18 and across the world to fuel clean nuclear power. This proposed facility will allow that need to  
19 be met from domestic sources, while providing a much needed economic boost to the entire  
20 region.

21  
22 **[146-01, Doug Sayer]** You know, what happens to my grandson happens to me. We're both  
23 Idahoans. But more importantly, we're both Americans. And we have to have that baseload  
24 energy. And until we have an alternative, nuclear is the answer. Decisions I made about my  
25 grandson's future are important. I realize that the decisions that we make, and the projects that  
26 we undertake are going to be his legacy to deal with....

27  
28 We encourage you to pursue this license and approve it, so that we can get back to work and  
29 build these nuclear projects like our country needs them.

30  
31 **[151-01, Beth Sellers]** The purpose of the facility has been made clear in the draft EIS. It is in  
32 the best interest of the citizens of the United States that we continue to support and increase the  
33 percentage of electricity generated by commercial nuclear power. It is a proven mission-free  
34 source of electricity. Furthermore, its increased use will enhance our national energy security.  
35 The sooner we become self-sufficient in fulfilling our energy needs, the more secure our nation  
36 will remain in these turbulent times.

37  
38 **[152-08, Steven Serr]** And my planning hat side. We are encouraging development and  
39 expansion. As mentioned, we are promoting alternate energy resource facilities. We have  
40 160 megawatts of wind power under construction at this time. For promoting the nuclear side  
41 with this, we've been promoting the nuclear research on the INL site, and we're also currently  
42 producing, or hope to be producing a cogeneration facility with a four county region, with a  
43 cogeneration facility for waste burning that also generates electricity.

44  
45 So we are promoting all sources of energy. we feel this is also a safe one, that meets the needs  
46 of the community, meets our rules and regulations.

1 **[155-01, Jerry Shivly]** First of all, it was going to help our nation, because we need the nuclear  
2 energy.  
3

4 **[163-02, Cindy Smith-Putnam]** The bigger picture is this project's significance to our regional  
5 and national energy future, and it is the national energy future that fundamentally and absolutely  
6 requires a significant reset from the status quo.  
7

8 Currently, under the E in Energy, Grow Idaho Falls has taken an active role in supporting the  
9 development and expansion of green renewable sources of energy. We can, we should, we  
10 have, and we will continue to support the diversification of the energy portfolio of our region and  
11 nation, to include harnessing the power of wind, water, heat, and light, to reduce the harmful  
12 effects to the environment of carbon emitting sources, and to promote our national security by  
13 becoming less reliant on foreign oil.  
14

15 Increasing renewables, promoting conservation, decreasing use of fossil fuels, all very  
16 important, we can, and we should do all of those things. And, yet, even taken together, none of  
17 that is enough, not nearly enough to meet our growing energy demands. Nuclear energy stands  
18 alone as the best way to produce the energy we need, while at the same time minimizing  
19 harmful environmental and geopolitical consequences. It gives us the opportunity to turn away  
20 from the practices of the past toward a more stable and sustainable energy future.  
21

22 Therefore, just as we need to be independent of unstable and unpredictable sources of oil, we  
23 also need to be independent of unstable and unpredictable sources of enriched uranium. Simply  
24 put, the Eagle Rock Enrichment Facility beautifully addresses that need.  
25

26 **[173-01, David Taylor]** ...I am strongly in favor of the construction and maintenance of the  
27 Areva complex and hope the rest of the DOE INL site can be used for productive nuclear  
28 research and generating capacity...  
29

30 We cannot supplant the energy from fossil fuels to the electric grid without vast improvements to  
31 the grid itself and to generating capacity. Nuclear is the only viable alternative and the only one  
32 that is "eco friendly" to the environment. Fear mongers and professional detractors "Snake River  
33 Alliance" use disgraceful tactics and words in attempting to keep their little source of revenue  
34 alive.  
35

36 We possess the technology (Gen IV reactors) and now need the common sense to use these  
37 resources to help sustain a vibrant economy and standard of living that we have all come to  
38 expect. The next generation will not have these opportunities if we squander and make feeble  
39 attempts to make nuclear energy production a reality now.  
40

41 I support Areva and the ideas that surround using nuclear technology as a great national effort.  
42 It must be for national security and for economic security. We must have a federal government  
43 that will establish certain protocols and reactor templates that if complied with will move to a fast  
44 track for licensing and construction. From there the government must run interference against  
45 all the special interest that come to bear only for the reason of capital extraction. Thanks for  
46 allowing us to be part of this potentially wonderful venture that will not only bless the lives of  
47 those who live and work here but for the whole nation.  
48

1 **[176-02, Hon. Jeff Thompson]** As an eastern Idahoan and Representative, I'm excited to hear  
2 that we are looking for sustainable energy solutions for our future, such as those provided by  
3 AREVA. The demand for electricity is becoming greater, and with this demand we're beginning  
4 to see prices soar. Nuclear energy offers a solution to our need for reliable energy sources now  
5 and in the future.  
6

7 **[178-02, Randy Trane]** This is a project that will serve two purposes. It will allow nuclear power  
8 to serve the world and it will help the economy in the Eastern Idaho area with much needed  
9 employment. I have several friends who are experts in the nuclear power industry and they are  
10 telling me that this project will not have any negative impact on the environment in this area.  
11

12 **[186-01, Lauren Walker]** We are supportive of the nuclear industry. Though we are, ourselves,  
13 not employed by the industry, we feel that the experience that we've had is absolutely  
14 compatible with the things that we do in our industry.  
15

16 We're supportive of bringing back manufacturing to the United States. We've become a service-  
17 oriented country. We need to start manufacturing for ourselves. Our dependence on foreign  
18 energy has taught us by sad experience that it's time to bring our independence home. It's a win  
19 for Idaho; it's a win for the United States of America.  
20

21 **Response:** *The NRC staff acknowledges these comments and appreciates the public*  
22 *participation. However, these comments are outside the scope of the EIS analysis because*  
23 *they do not relate to the content of the Draft EIS.*  
24

25  
26 **Comment:** The following comments express confidence in AES's capabilities and/or in the  
27 proposed EREF.  
28

29 **[023-01, Rebecca Casper]** I am pleased as a community member with AREVA's arrival in our  
30 community. They began giving back almost immediately upon their arrival, and corporate  
31 citizenship like that is nothing to be taken lightly. To me, it's a sign of responsible management  
32 and conscientious management, but that's just an observation.  
33

34 **[033-02, Hon. Mike Crapo; 075-02, Leslie Huddleston, on behalf of Hon. Mike Crapo]** I am  
35 confident EREF will meet the strong environmental and safety standards enforced by the NRC,  
36 and other federal, state, and local entities.  
37

38 **[034-04, Greg Crockett]** We trust AREVA.  
39

40 **[053-02, Hon. Jared Fuhriman]** You know, it was just a year ago, March, that I had the  
41 opportunity, along with two high school teachers and 20 high school students, to travel back to  
42 Tricastin, France, and there we were able to go through the George Besse Plant, which the  
43 Eagle Rock facility is modeled after. And I've got to tell you, it was very impressive as we were  
44 on the site, be able to witness the production of that.  
45

46 I had a chance to talk to elected officials there, as well as citizens of Tricastin, and they're very  
47 proud of the George Besse plant, and they're with AREVA, that they're their neighbor, and also  
48 the partnership in energy.  
49



1 One of the things that I noted when I was back there. All the plants were built right next to cities.  
2 And we had the opportunity to talk to many of the citizens, and there was absolutely no residual  
3 problems, that they could ever detect. I had the opportunity to meet with many AREVA  
4 executives and staff, both in France and the United States, and I have total confidence that the  
5 Eagle Rock enrichment facility will be operated safely and efficiently.  
6

7 **[053-03, Hon. Jared Fuhriman]** As Mayor of Idaho Falls, and as members of the City Council,  
8 we're elected to represent the best interests that our city has to the best of our ability, so when a  
9 proposed project like AREVA comes along, it's imperative that we do everything we can to  
10 exercise our due diligence in ferreting out the project, itself, and making sure that it's the best fit  
11 for our city and our communities.  
12

13 It is my opinion that we have tried to turn over every stone possible, as we looked into AREVA,  
14 and if it would be a benefit to our community. We have met with several mayors in eastern  
15 Idaho, and received their endorsement on this project. Myself, along with several other  
16 community leaders have personally met with representatives from AREVA numerous times, not  
17 only here in Idaho Falls, but at the headquarters in Bethesda, Maryland, in addition to a  
18 personal visit to Paris, France to the corporate office just to seek direction and information from  
19 them.  
20

21 One of the best pieces of evidence that I've obtained through my personal research regarding  
22 the potential environmental impacts was when I, along with 24 other members of our  
23 community, 20 of those being youth in our community, traveled back to Pierrelatte, France,  
24 population of 13,000. Pierrelatte is next door to the Tricastin Georges Besse plant, which has  
25 been operational for several years. I had the opportunity to personally visit with many of the city  
26 and the community leaders, as well as speaking with many of the citizens, themselves, in  
27 regards to the Tricastin plant, and if there was any residual issues that they have seen as a  
28 result of having lived right next door to that plant.  
29

30 I was able to see firsthand AREVA's sustainable development philosophy of protecting the  
31 environment. Through this visit, I found no evidence of any negative environmental impact on  
32 their community. What I saw, instead, was a vibrant and beautiful city and community.  
33

34 **[098-12, Linda Martin]** In its application, AREVA has proven itself to be technically capable of  
35 addressing and satisfying any NRC criteria or requirements, as well as addressing any waste  
36 issues per DOE and NRC guidelines, which may be necessary for the full and successful  
37 operation of this plant.  
38

39 **[114-01, Anne Mitchell]** Thank you for granting Areva a license to help create a clean, efficient  
40 energy source so direly needed in this country. They, of course, are a proven entity with a  
41 sterling history for safety, economy in their enrichment facilities. Our country needs this forward  
42 thinking element of clean energy and nuclear energy (so long over-looked by this country) is  
43 direly needed. I strongly appreciate the NRC's approval of Areva's license and embrace this not  
44 only for Idaho Falls, but also for my country which I love.  
45

46 **[123-02, Hon. Butch Otter; 090-02, Paul Kjellander, on behalf of Hon. Butch Otter; 195-02,**  
47 **Hon. Jeff Thompson, on behalf of Hon. Butch Otter]** AREVA is proposing to build a state-of  
48 the-art, technologically-proven, modern facility to enrich uranium needed to operate the existing

1 U.S. fleet of 104 power reactors. AREVA's plant will incorporate many unique features which  
2 have been developed over three decades of experience with centrifuge enrichment technology.  
3 AREVA's vast experience and use of the technology will result in minimizing and, where  
4 possible, eliminating any impacts on the surrounding environment and regional communities,  
5 but there will remain, however, many significant beneficial impacts....  
6

7 Safety, integrity, professionalism, and sustainability are demonstrated attributes that AREVA  
8 embraces in all of its projects and operations, and the Governor believes they'll bring no less to  
9 Idaho Falls. AREVA has been easy to work with, and they are as excited about coming to Idaho  
10 as we are to have them locate their facility here.  
11

12 As we look across the country today, there are not many, if any, states or regions that can claim  
13 proposed major energy construction projects or facilities like the Eagle Rock Enrichment  
14 Facility. While large projects are usually accompanied by some environmental impacts,  
15 Governor Otter believes the end result of this facility will be very positive for Idaho and the  
16 country. Eagle Rock will provide much needed domestic production of enriched uranium for our  
17 existing U.S. nuclear power fleet, which will help enable U.S. utilities to move away from  
18 importing nearly 90 percent of this important fuel product.  
19

20 **[135-01, Hon. Dave Radford]** The people I've met at AREVA have been wonderful. They  
21 already have 7,000 employees in the United States, so we're real comfortable with their way of  
22 doing business here in eastern Idaho.  
23

24 **[145-03, Ann Rydalch]** Our country is open to legal immigrants that come here for the  
25 American dream. Our country is open to legal foreign companies that want to do business in the  
26 United States. AREVA is a very experienced and credible company that wants to do business in  
27 the U.S.  
28

29 **[157-12, Hon. Erik Simpson]** I have great trust in those who have proposed this facility, and  
30 have considered a multitude of emergency situations, and have a plan for mitigation. With that, I  
31 am in support of the Draft EIS, and encourage the NRC to grant the license.  
32

33 **[158-03, Hon. Mike Simpson; 139-03, John Revier, on behalf of Hon. Mike Simpson]** Areva  
34 has a strong record of corporate safety and achievement, and the technology that Eagle Rock  
35 will use have been well-proven in the United Kingdom, mainland Europe, and now in the United  
36 States. I have the utmost confidence in the quality, safety, and security of their facilities.  
37

38 **[162-01, Michael Smith]** It is my opinion that AREVA should in fact be granted the license and  
39 permit to build the uranium enrichment facility located near Idaho Falls. I am a local citizen both  
40 born and raised in Idaho, I as most Idahoans care a great deal about the environment and the  
41 quality of life here in this area. I believe AREVA has gone beyond required measures to ensure  
42 the process used in the proposed facility will protect the environment and the citizens of this  
43 state.  
44

45 While there are still clean up measures on going at the INL we as a nation and the organizations  
46 working in the nuclear industry have learned a great deal in how to safely manage the relatively  
47 small amounts of waste generated. I fully support the NRC for its decision to allow the  
48 construction and operation of the new Eagle Rock Enrichment Facility.  
49

1 I also applaud AREVA for their decision to trust Idaho and its citizens enough to desire joining  
2 our neighborhood.

3  
4 **[167-01, Andrew Stevenson]** We weren't without our concerns originally on this project. As  
5 Erica mentioned, the facility is obviously going to have a significant impact on our community,  
6 and we were concerned that some of these impacts could, potentially, be negative, and so we  
7 wanted to find out more about that. But in March of 2009, AREVA took us to go see the  
8 Georges Besse II facility in France, which is, essentially, the same thing they would be building  
9 here, and while we were there, Erica actually raised some of those concerns.

10  
11 She touched briefly on the myriad recreational activities that are available here, just because of  
12 the pristine condition of our countryside, and our desire to see those areas preserved. There  
13 was also some concern about pollution, particularly in the water supply due to accidental  
14 pollution, but when we raised those questions, AREVA showed us some of the measures that  
15 they'd implemented to prevent such spillage and pollution. And we have to say, we were  
16 extremely impressed with it, even in cases of flood and earthquake, and crazy natural disasters  
17 that are never going to happen. It was extremely unlikely that any waste was going to be spilled  
18 into the surrounding area. An even greater reassurance came when we visited with residents of  
19 Pierrelatte, a French town in the area around the Tricastin site. They all live relatively normal  
20 lives, and there were no real noticeable effects from having that site on their borders. Most of  
21 them actually said that they felt that having the site there improved their general lifestyles, so we  
22 were very comforted by that. Also notable is the fact that the Tricastin site sits right on a river,  
23 and yet in all the time that that facility has been there, there have really never been any major  
24 issues with water contamination there, and that also eased our mind.

25  
26 **Response:** *The NRC staff acknowledges these comments and appreciates the public*  
27 *participation. However, these comments are outside the scope of the EIS analysis because*  
28 *they do not relate to the content of the Draft EIS.*

### 29 30 31 **I.5.3 NEPA Process**

32  
33 **Comment:** The following comment requests that the PowerPoint presentations and speaker's  
34 notes from the public meetings be made public on the NRC's website.

35  
36 **[115-01, Nicholas Molenaar]** Could the Power Point presentations be made public on your  
37 Web site? Also speaker's notes please.

38  
39 **Response:** *The NRC staff's PowerPoint presentations from the August 9 and August 12, 2010,*  
40 *public meetings in Boise and Idaho Falls, Idaho, respectively, can be found on the NRC's public*  
41 *website for the proposed EREF project, at [http://www.nrc.gov/materials/fuel-cycle-](http://www.nrc.gov/materials/fuel-cycle-fac/arevanc.html#3)*  
42 *fac/arevanc.html#3 (click on "Meeting Slides" links). The PowerPoint presentation given by Liz*  
43 *Woodruff of the Snake River Alliance during the August 9, 2010, public meeting in Boise, Idaho,*  
44 *can also be found on the NRC's website for the proposed EREF project, at*  
45 *<http://www.nrc.gov/materials/fuel-cycle-fac/arevanc.html#3> (click on "Meeting Transcript and*  
46 *Other Meeting Information" link, and then on the "Slides from Public Meeting Between the*  
47 *Nuclear Regulatory Commission and the Snake River Alliance" link).*

1 *There are no speakers' notes available from the two public meetings. However, the statements*  
2 *of all of the speakers at these meetings can be found in the meeting transcripts, which are*  
3 *available on the NRC's website at <http://www.nrc.gov/materials/fuel-cycle-fac/arevanc.html#3>*  
4 *(click on "Meeting Transcript and Other Meeting Information" link).*  
5  
6

7 **Comment:** The following comment expresses concern that copies of the Draft EIS and  
8 supporting documents were difficult to access and that inadequate numbers of hard copies of  
9 these documents were made available to the public.

10  
11 **[131-02, Morty Prisament]** Availability and Access to Documents: A related issue involves  
12 availability and access to the copies of the EIS and the above-referenced technical supporting  
13 documents. Distribution of the EIS and supporting documents has been extremely limited,  
14 thereby limiting opportunities for comment. Adequate numbers of hard copy documents should  
15 be provided to libraries, local government, and interested organizations in order to facilitate the  
16 broadest public review opportunities. This is a project of statewide significance and, therefore,  
17 multiple copies of the DEIS and all supporting documents should be, at minimum, made  
18 available through the Boise Main Library, given that Boise is the State Capitol. I do acknowledge  
19 that NRC did ultimately decide to hold a DEIS hearing in Boise. However, given that this was a  
20 late decision by NRC, I was unable to re-schedule and was out of the country at the time.

21  
22 **Response:** Pursuant to the NRC's regulations under 10 CFR 51.74, on July 21, 2010, the NRC  
23 staff published a Notice of Availability (NOA) for the Draft EIS in the Federal Register  
24 (75 FR 42466), announcing the issuance of the Draft EIS for public comment, in accordance  
25 with 10 CFR 51.73, 51.74, and 51.117. Among other information, the NOA contained  
26 information on how to access the Draft EIS and other documents related to the proposed EREF  
27 project. Documents were made available in hard copy at the NRC's Public Document Room in  
28 Rockville, Maryland, and at the Idaho Falls Public Library, 457 West Broadway, Idaho Falls,  
29 Idaho 83402. The Idaho Falls Public Library maintains an information repository on the  
30 environmental review for the proposed EREF project. Documents were also made available  
31 electronically through the NRC's public website, the NRC's Agencywide Documents Access and  
32 Management System (ADAMS), and the Federal Rulemaking website. Information on how to  
33 access each of these venues was provided in the NOA. Additionally, pursuant to 10 CFR 51.74,  
34 the NRC distributed the Draft EIS to approximately 135 individuals including Federal, Tribal,  
35 State, and local government officials and other interested parties (including members of the  
36 general public). Furthermore, references cited in the Draft EIS were publicly available through  
37 the NRC's ADAMS website (<http://www.nrc.gov/reading-rm/adams/web-based.html>) and/or  
38 through other publicly accessible venues such as the Internet, Federal, State and local  
39 government agencies and their websites, and public libraries.

40  
41  
42 **Comment:** The following comment maintains that the NEPA process should be restarted due to  
43 significant changes in the proposed Federal action.

44  
45 **[131-06, Morty Prisament]** Scoping: NEPA provides for a public scoping process in order to  
46 facilitate public and agency identification of issues to be analyzed in the DEIS. Public Scoping  
47 meetings, also required by NEPA, provides opportunities to comments on the issues to be  
48 studied in the DEIS. NEPA also stipulates that if the proposed federal action undergoes

1 significant changes, the scoping process needs to be re-started. Major changes to the proposed  
2 action have occurred, not the least of which has been doubling the capacity of the centrifuges.  
3 Therefore, the NEPA process should be re-started, beginning with a new Scoping Process, in  
4 order to afford adequate opportunities for comment and properly focus the DEIR analysis.  
5

6 Considering the extent and depth of my concerns, and those of others, the NEPA process does  
7 not provide for NRC to simply address comments in a Final EIS. NEPA calls, instead, for re-  
8 notifying and re-release of a revised EIS and, where needed, supporting documents. Also called  
9 for is a formally revised project (preferred action) description and initiation of a new Scoping  
10 Process.  
11

12 **Response:** *As noted in Section 1.4.2 of the EIS, the NRC staff's announcement of the Notice of*  
13 *Intent (NOI) to prepare the EIS, which initiated the NEPA process, was published in the Federal*  
14 *Register on May 4, 2009 (74 FR 20508). Publication of this NOI was purposely delayed by the*  
15 *NRC because AES notified the NRC of its intent to double the enrichment capacity of the*  
16 *proposed EREF. The NOI was published after the modified license application was received by*  
17 *the NRC from AES on April 23, 2009 (AES, 2009a), for the current proposed capacity of 6.6*  
18 *million separative work units (SWUs) per year. The NOI established a 45-day scoping period*  
19 *and announced a public scoping meeting that was held in Idaho Falls on June 4, 2009. No*  
20 *significant changes in the scope of the EIS have occurred since that time which would*  
21 *necessitate re-scoping the EIS.*  
22

23 **Comment:** The following comment expresses concern that the commenter's scoping  
24 comments were not addressed in the Draft EIS.  
25

26 **[141-01, Peter Rickards]** The Eagle Rock Draft EIS appears incomplete, not addressing the  
27 technical scoping issues I submitted. I do see the actual issues listed as received, on pages 88  
28 & 89 of 234 in the appendix section, but no actual answers were given.  
29

30 **Response:** *Responses to individual scoping comments were not prepared. Those comments*  
31 *relevant to the scope of the EIS were considered in the preparation of the EIS as discussed in*  
32 *Section 1.4.2 of the EIS.*  
33

34  
35 **Comment:** The following comment questions the analysis of impacts in the Draft EIS.  
36

37 **[181-02, Roger Turner]** And what is the science and environmental research behind the  
38 endorsement of the AREVA project? Well, science and environmental risks are being  
39 downplayed on this proposed project, because of job creation, and economic development.  
40

41 **Response:** *The NRC staff believes that it has provided an objective analysis in the EIS for all*  
42 *resource areas, based on the requirements of NEPA and the NRC regulations for implementing*  
43 *NEPA in 10 CFR Part 51. In the case of job creation and economic development, the*  
44 *socioeconomic impacts, beneficial and adverse, were found to be SMALL as presented in*  
45 *Section 4.2.12 of the EIS. The NRC staff does not believe that such a finding downplays the*  
46 *potential adverse impacts found in other resource areas with SMALL-to-MODERATE or*  
47 *MODERATE impacts.*  
48  
49



1 **Comment:** The following comment maintains that the Draft EIS fails to follow NEPA guidelines  
2 with respect to a number of issues.

3  
4 **[181-22, Roger Turner]** In summary the EIS fails to follow NEPA guidelines with respect to  
5 evaluation of the need, evaluation of temporary storage risks, evaluation of treatment facilities  
6 for depleted uranium. The EIS fails to follow up with a realistic evaluation of the proliferation  
7 risks, and to advance alternatives to the dangerous centrifuge system and its risks to violating  
8 the NPT treaty. The EIS must evaluate the risks of handling, moving and storing Uranium  
9 compounds at Areva, in the context of historical accidents with the casks, spills and releases of  
10 the material, the actual toxicity of the uranium and the associated indirect and cumulative risks  
11 to the environment, as required by NEPA.

12  
13 **Response:** *As stated in Section 1.1 of the EIS, the NRC has specific regulations under 10 CFR*  
14 *Part 51 to implement the requirements of NEPA. The NRC staff has followed the requirements*  
15 *of NEPA and the NRC regulations to independently evaluate all information used in the EIS.*  
16 *The need for the proposed EREF is discussed in Section 1.3 of the EIS. Potential impacts and*  
17 *risks from handling uranium compounds in various forms and the temporary storage of depleted*  
18 *uranium are discussed in Sections 4.2.10 and 4.2.11. Potential impacts from disposal of the*  
19 *depleted uranium are also discussed in Section 4.2.11. Potential impacts and risks from*  
20 *transportation of uranium feed material and waste are addressed in Section 4.2.9. Additional*  
21 *evaluation regarding proliferation risks is not within the scope of the EIS for reasons discussed*  
22 *in Section I.5.6 of this appendix. Alternatives to the gas centrifuge technology are identified and*  
23 *evaluated in Section 2.3.3. Accidental and intentional releases are considered in*  
24 *Sections 4.2.15 and 4.2.18. The toxicity of uranium compounds is discussed in Section 3.11.3*  
25 *and 4.2.15. Potential cumulative impacts and risks to the environment are covered in*  
26 *Section 4.3.*

27  
28  
29 **Comment:** The following comments suggest that the NRC's approach is one of advocacy and  
30 pre-determination.

31  
32 **[120-01, Frank Nicholson]** Very superficial – Did not address critical issues. As with city  
33 councils, your minds have already been made up.

34  
35 **[131-01, Morty Prisament]** Independent Analysis: The overall tone of the document is one of  
36 advocacy, which makes one question the objectivity of the document's conclusions. The  
37 document relies upon a number of technical documents. What were these documents  
38 precisely? Were these documents subjected to any type of independent peer review? Lacking  
39 such review, the objectivity of these documents would, likewise, be in question. Specifically,  
40 these documents relate to engineering studies, system safety and emergency response  
41 (including failure analysis and redundancy procedures), human health and ecological health risk  
42 assessments and associated probabilistic risk assumptions, benefit-cost analysis, socioeconomic  
43 impact analysis, and groundwater quality impact-related studies. The discussion of these issues  
44 is extremely limited given the scale of the action and associated risks.

45  
46 **Response:** *The NRC is a regulatory agency charged with protecting public health and safety*  
47 *and the environment. The NRC's mission does not include advocacy of nuclear technologies.*  
48 *The NRC staff believes that it used the best technical documentation available to support all*

1 *aspects of the environmental review. The documents used are identified and cited as*  
2 *references in the EIS.*

3  
4  
5 **Comment:** The following comments express concern regarding the level of detail provided in  
6 the Draft EIS, such as information and analyses regarding impacts from construction, operation,  
7 and decommissioning of the proposed EREF.

8  
9 **[027-05, Sara Cohn]** The ICL has reviewed the draft (EIS) for the Eagle Rock Enrichment  
10 facility and is concerned that construction and operation of the facility will pollute Idaho's natural  
11 resources and compromise public health. The EIS does not provide the level of detail that would  
12 allow ICL to assess environmental and public health impacts associated with the proposed  
13 project. Additionally, under Section 102 of the National Environmental Policy Act, federal  
14 agencies are directed to prepare detailed statements assessing the environmental impact of  
15 and alternatives to major federal actions significantly affecting the environment. Section 102  
16 also requires federal agencies to lend appropriate support to initiatives and programs designed  
17 to anticipate and prevent a decline in the quality of the public health and the environment. ICL  
18 believes the draft EIS does not accomplish either of these requirements. More detailed analysis  
19 must be provided in the final EIS and the not yet released Safety Report to allow the public and  
20 interested parties the opportunity to evaluate the project and to ensure that no adverse impacts  
21 occur that pollute Idaho's clean water and clean air, or endanger public health.

22  
23  
24 **[105-06, Eve McConaughey]** My most serious concerns were around the EIS and why no  
25 details were given for impacts of construction, operation, or decommissioning of the proposed  
26 EREF.

27  
28 **[120-01, Frank Nicholson]** Very superficial – Did not address critical issues. As with city  
29 councils, your minds have already been made up.

30  
31 **Response:** *Section 4.2 of the EIS presents detailed information and analyses regarding the*  
32 *impacts on human health and the environment from construction, operation, and*  
33 *decommissioning of the proposed EREF project. Chapter 2 describes and compares the*  
34 *proposed action and alternatives to the proposed action. The NRC staff believes that sufficient*  
35 *attention has been given to the level of detail of the information and analyses to ensure that the*  
36 *NRC's obligations under NEPA and the NRC's NEPA-implementing regulations under 10 CFR*  
37 *Part 51 have been met.*

38  
39  
40 **Comment:** The following comments indicate that the NRC needs improvement on its  
41 implementation of public outreach.

42  
43 **[059-01, Lance Giles]** No ads regarding meeting. Just articles or opinion pieces in local paper.  
44 Information about meeting difficult to find. No actual EIS comment form.

45  
46 **[105-01, Eve McConaughey]** I was not satisfied that the public received correct or true  
47 information or that the public had full opportunity to express their concerns because of the  
48 timing of the hearing and lack of information as presented by the officials. Presentation of the

1 EIS was very inadequate. It was completed only last month (July 2010). There was little  
2 opportunity given for questioning prior to testimony.... Also there was too much early time in the  
3 hearing allotted to elected and other officials out of the Boise area.

4  
5 **[131-07, Morty Prisament]** Also of note that NRC outreach has been “lackluster” at best.

6  
7 **[147-04, Joey Schueler]** I am in opposition to the Eagle Rock Uranium enrichment plant being  
8 put in Idaho Falls, Idaho! Although I understand the positive incentive arguments for the  
9 proposed plant, the arguments against the plant far outweigh the rather short term positive  
10 benefits. I think careful consideration should be given to each of the fifteen points I listed below  
11 when deciding whether to take this action. I also doubt many Idahoans know about this action  
12 and should be brought to a larger table of discussion.

13  
14 **Response:** *Public participation is an essential part of the NRC’s environmental review process*  
15 *under NEPA. Section I.2 of this appendix discusses the process for public participation during*  
16 *the NRC staff’s development of the EIS for the proposed EREF. As indicated in Section I.2, the*  
17 *NRC conducted an open, public EIS development process consistent with NEPA and the NRC’s*  
18 *NEPA implementing regulations under 10 CFR Part 51.*

19  
20 *Written comments on the Draft EIS could be submitted in many forms, including postal mail,*  
21 *emails, and uploads to the Federal rulemaking website, as well as written comments provided to*  
22 *the NRC staff at the two public comment meetings. No EIS comment form was needed,*  
23 *although the NRC staff did provide NRC Public Meeting Feedback forms at the public meetings,*  
24 *which could be used, and were used by many of the meeting participants, to provide written*  
25 *comments.*

26  
27 *The NRC staff provided accurate information to the public at the two public meetings. This*  
28 *information was commensurate with the time available for the NRC’s presentation and the need*  
29 *to present information that could be understood by all meeting attendees. All members of the*  
30 *public and government officials who registered to speak at the meetings were given an equal*  
31 *opportunity to speak. Due to the very large numbers of registered speakers at the two*  
32 *meetings, most of the meeting time was allotted to receiving public comments. Question and*  
33 *answer sessions were also limited by the large number of meeting attendees and speakers, but*  
34 *NRC staff were available prior to and after the meetings to discuss the Draft EIS with, and*  
35 *respond to questions from, members of the public.*

36  
37  
38 **Comment:** The following comments relate to attendance and speakers/commenters at the NRC  
39 public comment meetings for the Draft EIS.

40  
41 **[068-06, Anne Hausrath]** I very much appreciate having a public meeting in Boise. This  
42 proposed project would have a profound impact on Boise and all of Idaho.

43  
44 I am concerned that it appears people from Idaho Falls who testified in Boise might be given  
45 time in Idaho Falls as well at that public meeting. If that was the case I do not appreciate them  
46 being given preference and allowed to testify first in Boise.

47  
48 One opportunity to testify is great – thank you!

1 **[083-01, Diane Jones]** If I might, I'd like, respectfully, to make a comment on procedure. I'd  
2 just like to say, if you're going to have a hearing in Idaho Falls and a hearing in Boise, I think it's  
3 appropriate for people from Idaho Falls to testify there and not be able to testify twice in both  
4 hearings. There's a lot of us from Boise who really appreciate being able to testify but, you  
5 know, they have their hearing. There's one here for us.  
6

7 **[098-06, Linda Martin; 098-15, Linda Martin]** Stakeholders that reside in the immediate  
8 vicinity of the facility are the appropriate people to comment on these reviews. As residents,  
9 voters, and taxpayers, we locally represent the immediate concerns for impacts to our  
10 community.  
11

12 **[178-01, Randy Trane]** Thank you for the opportunity to comment on the proposed Areva  
13 project in the Idaho Falls, Idaho area. I hope common sense will prevail with this decision. It  
14 seems as though the minority in this country rules the masses. The Snake River Alliance and  
15 similar type people and groups have one objective in mind. That is to slow or stop progress at  
16 any costs. Of course they are against any drilling of gas, oil or coal and they are against nuclear  
17 power. I suppose they feel like solar and wind will take care of the world.... Please do not allow  
18 this small minority group to override the wishes of this area and with needed nuclear power  
19 worldwide.  
20

21 **Response:** *Public meetings held by the NRC, such as the two public comment meetings the*  
22 *NRC staff held on the Draft EIS for the proposed EREF project, are open to all members of the*  
23 *public, and all persons who register to speak at such meetings are given an equal opportunity to*  
24 *speak.*  
25  
26

27 **Comment:** The following comments caution the NRC to provide a careful, thorough, and  
28 credible analysis in the EIS, and to consider all public comments provided.  
29

30 **[067-04, Mike Hart]** I would urge the NRC to review their testimony for the legitimate concerns,  
31 but also pay attention to the procedural trip wires, because an EIS is an important legal  
32 document. It has to be done well, otherwise the proposal gets caught up in court. So, please do  
33 your job, listen, and pay attention to the procedural trip wires....  
34

35 I think the NRC has done a good job with the EIS, but I think they also need to make sure it's  
36 procedurally tight, so we don't spend a lot of time in court, so that this EIS moves through  
37 quickly, but that means they have to do a thorough and excellent job, and I would encourage  
38 them to review all opposition comments, adhere to the letter of the law, follow the procedure,  
39 and give us an EIS that we can proceed forward with the license.  
40

41 **[077-01, Larry Hyatt]** I'd like to speak briefly to the issue of credibility and accuracy of information.  
42 I've observed, personally, for over years, basically the life of the Snake River Alliance, and have  
43 been a member of that group for many years, that time and time again, when they have taken  
44 positions based on concerns, research, and positions of information to implement, and suggestions  
45 and requests, that over and over and over again, they have been correct. And that says a heart full  
46 of information for me. Therefore, I sincerely request that you evaluate, to the deepest level you  
47 possibly can, all of the accurate, sincere information, that our Snake River Alliance has  
48 compiled and presents to you.  
49

1 **[098-07, Linda Martin]** We appreciate the time and expertise, and patience, at this point, the  
2 NRC has devoted to the licensing and permitting process. We hope that your studies and  
3 deliberations will continue to rely on scientific fact, and technology for a timely and positive  
4 outcome for our community and Idaho.  
5

6 **[145-02, Ann Rydalch]** I urge the NRC to continue to listen to scientific facts, and to disregard  
7 untruthful or scare tactic statements, statements such as DOE is giving \$2 billion loan  
8 guarantee, a misleading statement, because no money exchanges hands. DOE is not giving  
9 AREVA the 2 billion dollars. However, by it being included in the Loan Guarantee Program,  
10 AREVA and other companies in that program will be able to possibly receive lower interest  
11 rates. It's like the Good Housekeeping Seal of Approval. Or another scare statement that  
12 building this will cause further degradation of the habitat for sage grouse. The truth is, the NRC  
13 preliminary conclusion, as described in Chapter Four, which I have read, the environmental  
14 impacts of preconstruction and the proposed actions would mostly be small.  
15

16 **[159-02, Robert Skinner]** My caution to the NRC is to take all comments and evaluate them  
17 based on their technical merit.  
18

19 **[177-02, Hon. T.J. Thomson]** Also, please adequately plan, at the front-end, for any  
20 environmental impacts and long-term effects to the area and dedicate the time necessary to  
21 realistically prepare for any unforeseen consequences, both financial and otherwise.  
22

23 **Response:** *As stated in Section 1.1 of the EIS, the NRC has specifically formulated regulations*  
24 *under 10 CFR Part 51 to implement the requirements of NEPA. In preparing this EIS, the NRC*  
25 *staff has followed the requirements to independently evaluate and verify all information used in*  
26 *the EIS. In addition, as demonstrated in Section I.5 of this appendix, the NRC staff has*  
27 *reviewed and considered all comments provided on the Draft EIS in preparing the Final EIS.*  
28  
29

30 **Comment:** The following comments express appreciation for, and approval of, the NRC's  
31 efforts with regard to the Draft EIS and licensing process for the proposed EREF.  
32

33 **[034-05, Greg Crockett]** As citizens of the communities closest to the facility, we feel there are  
34 certain potential environmental impacts that needed to be addressed in the EIS. We want to  
35 thank NRC and its staff for the amount of work that went into the research and evaluation of this  
36 Draft EIS along with the Safety Analysis Report.  
37

38 Last June at the EIS scoping meeting held in Idaho Falls, we asked you to consider the  
39 following potential impacts. (1) land use, (2) transportation, (3) geology and soils, (4) water  
40 issues, (5) ecological issues, (6) air quality, (7) historic and cultural issues, (8) socioeconomic,  
41 (9) public and occupational health, (10) noise, and (11) waste management.  
42

43 We understand and support the NRC's primary role in the protection of public health and  
44 safety and as neighbors of the Eagle Rock Enrichment Facility we thank you for your  
45 dedication and expertise.  
46  
47



1 **[002-01, Lane Allgood]** Last June, at the EIS scoping meeting held in Idaho Falls, we asked  
2 you to consider the following impacts. Land use, transportation, geology and soils, water issues,  
3 air quality, historic and cultural issues, social, economic, public and occupational health, noise,  
4 and waste management. All of those potential impacts were addressed in the EIS and we  
5 appreciate that.  
6

7 As citizens of the communities closest to the facility, these potential impacts are very important  
8 to us. We want to thank you for the obvious amount of work that went into the research and  
9 evaluation of this draft EIS, along with the safety analysis report, and after reviewing this draft,  
10 we understand why the licensing process takes so long.  
11

12 **[024-02, Jana Chalfant; 149-02, Wendi Secrist; 196-02, Linda Martin, on behalf of the**  
13 **Idaho Economic Development Partners]** We appreciate the NRCs use of scientific expertise  
14 to guide the decisions for issuance of the license and permit for the Eagle Rock Enrichment  
15 Facility. We feel that the NRC procedures for the licensing process have been very satisfactory,  
16 and thank you for your thoroughness.  
17

18 **[026-04, Rob Chiles]** Over the last few years, the business community and members of the  
19 Chamber of Commerce have shown support for this important economic development project.  
20 We are here again tonight to commend you for a job well done. We are confident in your  
21 analysis, and agree with your recommendation to grant AREVA the license.  
22

23 **[033-03, Hon. Mike Crapo; 075-03, Leslie Huddleston, on behalf of Hon. Mike Crapo]** The  
24 staff of the NRC have consulted with Tribal, federal, state, and local entities. They have  
25 considered the comments released in the environmental review received during the public  
26 scoping process. They have thoroughly reviewed the report revisions, and supplementary  
27 information submitted b AES. I have confidence in the NRC to analyze potential impacts of  
28 construction, operation, and decommissioning of this proposed facility.  
29

30 I strongly support the NRC's preliminary recommendation that AREVA Enrichment Services be  
31 issued a license to construct and operate the Eagle Rock Enrichment Facility.  
32

33 **[042-03, John Deal]** We commend the process completed thus far and appreciate that the  
34 NRC's only role is that of protecting public health and safety.  
35

36 Hyperion Power, as a member of the Idaho community, and future neighbors of the Eagle Rock  
37 Enrichment Facility, thank you for your dedication.  
38

39 **[051-01, Jackie Flowers]** I want to thank you, the NRC staff, for your due diligence as you  
40 evaluated the AREVA license application for the Eagle Rock Enrichment Facility, and your  
41 commitment in safeguarding that process.  
42

43 This facility is proposed to be located in our collective backyard. Your work has resulted in  
44 identifying and evaluating potential environmental impacts that our community is concerned  
45 about, important topics like water resources, air quality, waste management that could impact  
46 our day-to-day lives, and our quality of life. You have also completed important work related to  
47 safety analysis report, another topic of community concern. I appreciate the NRC's commitment

1 to its primary role, protecting public health and safety, as you have contemplated the application  
2 before you.

3  
4 As Idahoans look to welcoming new industry in eastern Idaho, we want to know that we are  
5 doing so, while maintaining the clean, safe, and healthy environment we currently enjoy. We  
6 look to you, the NRC staff, the experts, to conduct a thorough analysis. You have completed this  
7 Draft EIS investigating areas of concern as expressed by the community, and we look forward  
8 to welcoming AREVA to eastern Idaho.

9  
10 **[065-01, Hon. Ida Hardcastle]** My name is Ida Hardcastle, I currently serve as the President of  
11 the Idaho Falls City Council, a position I have held for 17 years. My husband and I came to  
12 Idaho Falls 45 years ago for him to accept a position with the nuclear industry as an engineer.  
13 Obviously we are very much in favor of this project. In addition we appreciate the efforts of the  
14 NRC Staff as you have worked through this licensing applications and the detail to safety for the  
15 Eagle Rock Enrichment Facility. Obviously the Draft EIS and the Safety Analysis Report have  
16 taken a large amount of time and it appears that you have addressed appropriately the potential  
17 impacts identified at the June EIS scoping meeting in Idaho Falls. We thank you for your  
18 thoroughness.

19  
20 **[053-01, Hon. Jared Fuhriman]** I also want to congratulate, and thank the NRC for a very  
21 thorough draft EIS, and safety analysis report. It's obvious that a great deal of work has gone  
22 into this production. I understand, acutely understand better, the great work and the effort that it  
23 takes, and as mayor, I appreciate the detail in your research, and the potential impacts that it  
24 has on this project and our communities.

25  
26 Please be assured that before we decided to support this project, we did a great deal of  
27 research ourselves, to ensure that this type of facility was appropriate for our community.

28  
29 While I'm not a nuclear expert, many Idaho Falls residents are, and we have the luxury to  
30 receive counsel from them when we have questions involving nuclear and environmental  
31 issues.

32  
33 I also agree, recognize the expertise of the NRC team that is working on this licensing  
34 application, and I thank you for the time that you've given to us as we've traveled back to  
35 Washington, D.C. and have met with you. We truly appreciate that. Your courtesy and frankness  
36 has helped our community better understand the licensing process.

37  
38 **[053-04, Hon. Jared Fuhriman]** I once again want to go on record one more time stating that  
39 I'm personally satisfied with the thoroughness and the efforts that NRC has made to this point in  
40 time regarding the EIS, and endorse that AREVA should be licensed to construct the Eagle  
41 Rock Enrichment Facility.

42  
43 **[079-03, Kristen Jensen; 179-03, Jolie Turek; 194-02, Linda Martin, on behalf of Eastern  
44 Idaho Economic Development Partners]** We feel that the NRC procedures for the licensing  
45 process have been very satisfactory, and thank you for your thoroughness.

1 **[094-04, Michael Lange]** So, AREVA, notwithstanding, I don't know AREVA. I've never worked  
2 for AREVA, but I trust the NRC. And being -- during my time in government -- being what most  
3 people in Montana would consider me a right-wing Republican, was also the president of a labor  
4 union, I can tell you that I have confidence in a few government agencies to regulate properly.  
5 One of them is the NRC, so we can be thankful that we have an agency that is that concerned  
6 about safety, about mockups, about making sure that it's done right the first time. So, that's real  
7 kudos for the Commission. I would extend that to you from personal experience.  
8

9 **[098-07, Linda Martin]** We appreciate the time and expertise, and patience, at this point, the  
10 NRC has devoted to the licensing and permitting process. We hope that your studies and  
11 deliberations will continue to rely on scientific fact, and technology for a timely and positive  
12 outcome for our community and Idaho.  
13

14 **[094-01, Michael Lange]** I have a unique perspective. In 2002, I was elected to the Montana  
15 State legislature. I served there for six consecutive years, before going on to lose the United  
16 States Senate race in Montana. And the last four of those years, I served as the House Majority  
17 Leader, so I'm well aware of the particulars of a NEPA review. I have thoroughly read this EIS,  
18 and it is very professionally written. It is very accurately done. It does, in fact, comply with NEPA  
19 requirements, and I commend the NRC for that effort.  
20

21 **[133-09, Richard Provencher]** From an operational safety standpoint, the Nuclear Regulatory  
22 Commission is involved in reviewing the license application and will ultimately ensure that  
23 operations are being conducted safely, that proper safety controls are in place, and that  
24 possible safety events have been evaluated with response plans in place. As an independent  
25 licensing agent, it is comforting to know the NRC will review this facility as a third party to  
26 ensure the protection of the public and environment.  
27

28 **[135-04, Hon. Dave Radford]** And we applaud your work, we respect your work, and we hope  
29 for a great outcome for an expedited license for AREVA.  
30

31 **[138-01, Christine Reichgott, on behalf of the U.S. Environmental Protection Agency,  
32 Region 10]** We note with appreciation that the DEIS addresses many of the issues we raised  
33 during the project scoping period in June 2009, including analysis of cumulative impacts and  
34 climate-change effects. Also, we commend NRC staff for working with a variety of stakeholders  
35 and considering public comments in the NEPA analysis for the project. The DEIS document  
36 includes a good description of resources within the project area, analysis of anticipated  
37 environmental impacts from the project, mitigation measures to offset the impacts, and  
38 monitoring programs for potential radiological and non-radiological releases from the facility to  
39 the environment and measures to be taken to prevent such releases and ensure protection of  
40 environmental resources and human health in case an accidental release occurred.  
41

42 **[143-02, Hon. James Risch; 172-02, Amy Taylor, on behalf of Hon. James Risch]** I am  
43 confident that the Nuclear Regulatory Commission will address the safety and environmental  
44 impacts from this proposed facility.  
45  
46

1 **[176-01, Hon. Jeff Thompson]** Thank you all for attending tonight, and for listening to  
2 everyone's concerns and questions. It is obvious you have taken time to address many of our  
3 concerns in the Safety Analysis Report. We appreciate the commitment to protecting the  
4 public's health and safety.  
5

6 **Response:** *The NRC acknowledges these comments and appreciates the public participation.*  
7  
8

9 **Comment:** The following comments express approval of the Draft EIS and state that the  
10 Draft EIS addresses the appropriate concerns.  
11

12 **[011-01, Donald Baxter]** I am in complete agreement with the comment previously submitted  
13 by another supporter of the Eagle Rock Facility. "I support the NRC assessments regarding the  
14 potential impacts named in the draft EIS, and agree with the findings that the impacts are small  
15 to moderate. We also find them more than acceptable when viewed in relation to the positive  
16 benefits this project will bring, which are not small to moderate, but instead massive and  
17 transformative. Finally, we agree with your preliminary conclusions that this project deserves to  
18 move forward."  
19

20 **[026-01, Rob Chiles]** After careful review with a number of scientific environmental and socio  
21 economic experts, we strongly feel that the Draft EIS has covered all of our concerns. We are  
22 convinced the NRC has done a thorough job in analyzing all the aspects of this project, and agree  
23 the results are complete and accurate.  
24

25 **[034-06, Gregg Crockett]** Following review of the Draft EIS, we concur that the following  
26 potential impacts were evaluated and scored correctly under the Council on Environmental  
27 Quality's significance levels:  
28

- 29 • Land Use: Small
- 30 • Transportation: Small to Moderate
- 31 • Geology and Soils: Small
- 32 • Water Resources: Small
- 33 • Ecological Issues: Small to Moderate
- 34 • Air Quality: Small to Large (We do understand that during construction dust from heavy  
35 equipment working on the proposed site will generate dust from land grading  
36 operations that would result in a large but temporary condition. We live in eastern  
37 Idaho with its wind and agricultural activity. We don't believe dust will be a significant  
38 problem.)
- 39 • Historic and Cultural Issues: Small to Moderate
- 40 • Public and Occupational Health: Small
- 41 • Noise: Small
- 42 • Waste Management: Small  
43

44 ...In closing we agree with the NRC staff recommendation that due to insignificant environment  
45 impacts of the EREF, AREVA should be issued a license to construct and operate the facility  
46

1 **[042-02, John Deal]** After reviewing the Draft EIS scoping on community impact we concur that  
2 the impacts were scored correctly and reflect a conservative and measured approach to the  
3 study.

4  
5 **[051-03, Jackie Flowers]** I support the NRC staff recommendation that due to small  
6 environmental impacts from the Eagle Rock Enrichment Facility, AREVA should be issued a  
7 license to construct and operate the facility.

8  
9 **[060-01, Ericka Gianotto]** Now with the release of the Environmental Impact Statement for the  
10 public comment, our concerns about the impact on the surrounding area and whether this  
11 facility would affect the pristine condition of Idaho's countryside, have been allayed.

12  
13 While we know the facility will affect the surrounding area, we believe these impacts will be  
14 small and have been or will be mitigated.

15  
16 **[065-01 and 065-02, Hon. Ida Hardcastle]** My name is Ida Hardcastle, I currently serve as the  
17 President of the Idaho Falls City Council, a position I have held for 17 years. My husband and I  
18 came to Idaho Falls 45 years ago for him to accept a position with the nuclear industry as an  
19 engineer. Obviously we are very much in favor of this project. In addition we appreciate the  
20 efforts of the NRC Staff as you have worked through this licensing applications and the detail to  
21 safety for the Eagle Rock Enrichment Facility. Obviously the Draft EIS and the Safety Analysis  
22 Report have taken a large amount of time and it appears that you have addressed appropriately  
23 the potential impacts identified at the June EIS scoping meeting in Idaho Falls. We thank you for  
24 your thoroughness.

25  
26 I spend a large amount of time in the city among the residents and it is exciting to feel the  
27 enthusiasm most have for this project coming to Idaho Falls. Of course the main interest is the  
28 economic impact it will have on the area, in other words - jobs. Also the community supports the  
29 fact that there will be a very small environmental impact from this facility. We thank the NRC  
30 again for their efforts in this particular concern. We have a top notch workforce here which was  
31 recognized by AREVA in the beginning. The community as a whole supports energy being  
32 produced by nuclear power. We simply have to address our independence on foreign oil.

33  
34 **[067-05, Mike Hart]** One of the concerns was that there's project clearing going on before the  
35 impact statement is done. NEPA requires you're not supposed to have an irrevocable  
36 commitment of resources. I don't believe the site clearing counts as that, so as a result, I think  
37 the project can continue forward without violating that NEPA precept.

38  
39 **[069-01, Scott Hawk]** I support the NRC assessments regarding the hazards and potential  
40 impacts addressed in the draft EIS I agree with the findings that the impacts are acceptable to  
41 manage safely. I look forward to the massive and transformative positive benefits this project  
42 will bring to Eastern Idaho. Finally, I agree with your preliminary conclusions that this project  
43 deserves to move forward

44  
45 **[073-01, Mark Holzmer]** I wholeheartedly support the NRC assessments regarding the  
46 potential impacts named in the draft EIS. You concluded that the environmental impacts are  
47 small to moderate, and I personally believe that your conclusions easily bound the



1 environmental impacts and may indeed be much lower. These impact findings are more than  
2 acceptable, especially considering the positive benefits this project will bring to southeast Idaho.

3  
4 Finally, I agree with your preliminary conclusions that this project deserves to move forward.

5  
6 **[076-01, Martin Huebner]** I want to address my personal and informed opinion on the  
7 adequacy of the Draft Environmental Statement for AREVA's proposed Eagle Rock facility. I  
8 reviewed the EIS, and I find no errors or omissions in it. It is a well-crafted and complete  
9 document, which should be accepted and approved, as is. The impact statement has been  
10 criticized unnecessarily and repeatedly by the Snake River Alliance, who I have been dealing  
11 with since it was founded years ago.

12  
13 **[079-02, Kristen Jensen; 179-02, Jolie Turek; 194-02, Linda Martin, on behalf of Eastern  
14 Idaho Economic Development Partners]** We feel confident that the NRC and AREVA have  
15 addressed all necessary safety and environmental concerns in the draft EIS. We urge the NRC  
16 to stay on scope and utilize scientific expertise to guide their decisions for issuance of the  
17 license and permit for the EREF plant.

18  
19 **[228-07, Jim Kay]** Our comments on the DEIS are only editorial. As we have indicated  
20 previously, we believe the DEIS was well prepared and adequately supports the proposed  
21 action to issue a license.

22  
23 **[102-03, R.D. Maynard]** I applaud the NRC on your very thorough work on this licensing  
24 application and appreciate the detail of research that went into the EIS.

25  
26 I would suggest that anyone with concerns about environmental issues associated with this  
27 project spend some time reading the environmental impacts, mitigation, environmental  
28 measures, and monitoring programs, and summary of environmental consequences section of  
29 the EIS.

30  
31 I strongly support this as a citizen of the State of Idaho.

32  
33 **[124-01, Lane Packwood]** We've also reviewed the EIS, and from a technical point of view, we  
34 find it is adequate, and we encourage you to proceed to the next step, licensing.

35  
36 **[130-01, Park and Sharon Price]** We support the NRC assessments regarding the potential  
37 impacts named in the draft EIS and agree with the findings that the impacts are small to  
38 moderate. The need for an enrichment facility as proposed by AREVA is long overdue. The  
39 importance of increasing the production of power by nuclear generation is vital to the  
40 United States.

41  
42 **[135-04, Hon. Dave Radford]** We, as the commission, agree with the Environmental Impact  
43 Statement's conclusion.

44  
45 **[142-01, Blake Rindlisbacher, on behalf of the Idaho Transportation Department]** Thank  
46 you for your early and close consultation with the Idaho Transportation Department in the  
47 development of this environmental impact statement. We believe the statement as expressed in  
48 this draft is accurate with regards to our state highway system and the impacts this project will

1 have on it. The mitigation you cite for those impacts are indeed appropriate and we encourage  
2 the NRC to make ride sharing and shifts staggered from those of the Idaho National Laboratory  
3 a part of the operating license for AREVA Enrichment Services. We will continue to discuss with  
4 them the terms and conditions of their access to US-20, but specific operation behavior that  
5 may reduce risk is beyond our authority to require.  
6

7 **[145-01, Ann Rydalch]** We thank the NRC for the staff's preliminary conclusion that the Eagle  
8 Rock Enrichment Facility would have mostly small impacts on the local environment and that  
9 AREVA should be issued a license to construct and operate the facility. I encourage you to  
10 follow the preliminary recommendation that AREVA be issued a license to construct and  
11 operate the Eagle Rock Enrichment Facility here in Bonneville County, Idaho Falls, Idaho,  
12 formerly called Eagle Rock, Idaho.  
13

14 **[151-02, Beth Sellers]** The draft EIS covered a wide range of impacts. They are the standard  
15 impacts that are seen with any major construction activity. The areas of most concern to me  
16 include water resources, ecological and cultural resources, waste management, and the  
17 transportation impacts to those of us in Idaho Falls. The NRC analysis was comprehensive and  
18 the impacts were noted to be small in the majority of the impacts analyzed. For those  
19 environmental impacts noted to be in the moderate to large range, the mitigations detailed by  
20 the applicant were deemed acceptable.  
21

22 I support the NRC staff recommendation that due to small environmental impacts from the  
23 Eagle Rock Enrichment Facility, Areva should be issued a license to construct and operate the  
24 facility.  
25

26 **[152-02, Steven Serr]** I've had an opportunity to read your draft EIS. I agree with most of the  
27 issues that you've stated in there as far as compliance, with what we feel are important within  
28 the jurisdictions for enforcement.  
29

30 **[157-05, Hon. Erik Simpson]** In conclusion, I want to state that I strongly support the AREVA  
31 project, and feel the draft EIS is very adequate and considers the environmental factors associated  
32 with the facility. I believe AREVA will be a positive addition to the State of Idaho, and an integral  
33 part of our nation's development of energy independence.  
34

35 **[159-01, Robert Skinner]** I have carefully read the Draft EIS, all of it I have not read totally,  
36 because it is huge. You're going to put the guys that sell sleeping pills out of business, I'm sure,  
37 but I would like to commend the crafters of this document for their hard work and diligence. I find  
38 it to be thorough, and lacking in no respect technically. I am here to address the technical  
39 aspects of the EIS....  
40

41 I believe AREVA should be issued a license to construct and operate the Eagle Rock Enrichment  
42 Facility at the earliest opportunity.  
43

44 **[163-03, Smith-Putnam, Cindy]** As your EIS shows, and like in all human endeavors, the  
45 project is not wholly devoid of impact. The air quality issue is an impact; yet, we are mindful that  
46 land and dust issues are a normal part of any major construction, and will be temporary and  
47 brief in duration. Risks and impacts are an inherent part of life on this planet. They cannot be

1 avoided, but they can be anticipated, and evaluated, weighed and measured in comparison to  
2 their relative reward and benefits.

3  
4 What is important to maintain, as Rocky said, is a sense of perspective when evaluating those  
5 risks and impacts. And that is what the opponents of this license approval fail to do when they  
6 engage in hyperbole and misdirection bringing more heat to the subject than light....

7  
8 We support the Preliminary NRC assessments regarding the potential impacts named in the  
9 Draft EIS, and we agree with the findings that the impacts are small to moderate. We also find  
10 them more than acceptable when viewed in relation to the positive benefits this project will  
11 bring, which are neither small nor moderate, but, instead massive, and transformative.

12  
13 Finally, we agree with your preliminary conclusions that this project deserves to move forward.  
14 We hope you will continue to rely on scientific fact in making these decisions, and not be  
15 swayed by emotion or opinion, and we urge you to grant the license for the AREVA project in a  
16 timely manner. Thank you for considering our perspective.

17  
18 **Response:** *The NRC acknowledges these comments and appreciates the public participation.*

#### 19 20 21 **I.5.4 Purpose and Need**

22  
23 **Comment:** The following comment questions the need for the proposed EREF with regard to  
24 U.S. national energy security.

25  
26 **[015-09, Beatrice Brailsford]** The basis for and discussion of the second “need” - domestic  
27 supplies of enriched uranium for national energy security - is beyond puzzling. Setting aside the  
28 fact that the enriched uranium market is an international market, the key word in the current  
29 rationale is “domestic.” The “national energy security policy objective” Areva’s plant is supposed  
30 to meet was enunciated in a letter from Assistant Secretary William Magwood at the Department  
31 of Energy (DOE) to the Nuclear Regulatory Commission eight years ago. The focus of the letter  
32 was not that the US needed a foreign company to build a plant here, but rather that an  
33 American company should have a stake in US enrichment capacity. The US Enrichment  
34 Corporation has been granted a license - though not a federal loan guarantee - to build a plant,  
35 which would seem to more directly meet the policy objective enunciated in the letter. If the NRC  
36 is pointing to a “policy objective,” that objective must have been articulated more recently and  
37 with a “higher profile” than a single letter from an Assistant Secretary provides.

38  
39 **Response:** *While the enriched uranium market may be an international one, the addition of*  
40 *domestic uranium enrichment capacity, as would be provided by the proposed EREF, would*  
41 *help fulfill the need for U.S. domestic energy security, as discussed in Section 1.3 of the EIS.*  
42 *As discussed in Section 1.6 of the EIS, AES is a Delaware limited liability corporation that was*  
43 *formed solely to provide uranium enrichment services for commercial nuclear power plants. As*  
44 *discussed in Section 1.3.2 of the EIS, one of the needs for the proposed EREF is increased*  
45 *domestic uranium enrichment for enhanced energy security. The DOE letter (DOE, 2002)*  
46 *referenced in the comment is one reflection of that need, and it also references the concurrence*  
47 *of the U.S. Department of State on the matter.*

1 **Comment:** The following comment questions the adequacy of the economic justification for the  
2 proposed EREF.

3  
4 **[068-04, Anne Hausrath]** My husband and I raised our children in Idaho. We are very much  
5 concerned about the current economic climate for their generation, and we believe there's a  
6 responsibility of all of us to provide for that. I don't believe that this plant is adequate -- that the  
7 economic is adequate justification for that.

8  
9 **Response:** *As discussed in Section 1.3 of the EIS, the need for domestic enriched uranium*  
10 *services is one of the reasons why the proposed EREF is needed. The potential beneficial*  
11 *economic impacts are just one of the outcomes that result from the range of analyses over*  
12 *multiple resource areas considered in the EIS.*

13  
14  
15 **Comment:** The following comment questions the credibility of statements in the Draft EIS that  
16 the proposed EREF will aid the United States in achieving energy independence and/or more  
17 national security.

18  
19 **[147-17, Joey Schueler]** 13. The notion that this plant will aid the United States in achieving  
20 energy independence and/or more national security is a myth. The United States does not  
21 control all steps in the Nuclear Power generation process. As a result, every other step that we  
22 can produce is dependent upon other nations and what they can contribute. Removing one step  
23 in the process would curtail or stop our nuclear energy system.

24  
25 **Response:** *The addition of domestic uranium enrichment capacity, as would be provided by the*  
26 *proposed EREF, would help fulfill the need for U.S. domestic energy independence and*  
27 *security, as discussed in Section 1.3 of the EIS. As noted in the comment, other steps are*  
28 *required so as not to curtail or halt nuclear energy in the United States, but those aspects are*  
29 *outside the scope of this EIS because they do not relate to the environmental review of the*  
30 *proposed EREF project.*

31  
32  
33 **Comment:** The following comment questions the need for an AES uranium enrichment plant in  
34 the U.S. when a similar plant AES is constructing in France could instead be expanded.

35  
36 **[168-07, Lon Stewart]** If Areva is currently building a similar plant in France, economy of scale  
37 would make more sense to expand that plant rather than building another plant in the western  
38 United States.

39  
40 **Response:** *As discussed in Section 1.3.1 of the EIS, the proposed action, which is to construct,*  
41 *operate, and decommission a uranium enrichment plant near Idaho Falls in Bonneville County,*  
42 *Idaho, is intended to satisfy the need for an additional reliable and economical domestic source*  
43 *of uranium enrichment services. Expanding AES's plant in France would not satisfy that need.*

44  
45  
46 **Comment:** The following comment questions the premise in the Draft EIS regarding the need to  
47 lessen the U.S. dependence on enriched uranium from foreign sources.

1 **[193-11, Liz Woodruff, on behalf of the Snake River Alliance]** And when our country gets  
2 crude oil from overseas and refines it here, does that lessen our dependence? So these are  
3 questions we need to ask about the premise set up in the EIS.  
4

5 **Response:** *The proposed action is intended to satisfy the need for an additional reliable and*  
6 *economical domestic source of uranium enrichment services. While the proposed action would*  
7 *not entirely remove dependence on foreign sources, it would partially address that dependence.*  
8  
9

10 **Comment:** The following comments question the premise in the Draft EIS that a reliable source  
11 of enriched uranium is needed.  
12

13 **[191-07, Liz Woodruff]** The draft EIS fails to establish that the current approach to supplying  
14 enriched uranium is unreliable. There is uranium enrichment in the US, enriched uranium has  
15 always been an international market, the raw material comes from foreign sources, and this  
16 system has adequately provided fuel for US reactors for decades.  
17

18 **[193-10, Liz Woodruff, on behalf of the Snake River Alliance]** And I'd just like to pause here,  
19 to check in on this theory of theirs, that there is this need for reliability. Have we ever shut down  
20 a reactor because the fuel source was unreliable, in this country? It seems like it's been working  
21 pretty well so far.  
22

23 **Response:** *The proposed action is intended to satisfy the need for an additional reliable and*  
24 *economical domestic source of uranium enrichment services to help ensure that no U.S.*  
25 *reactors would have to be shut down in time of crisis because of lack of fuel. Past experience*  
26 *may not be predictive of whether such a crisis will occur in the future. The current domestic*  
27 *enrichment services are not sufficient to support U.S. demand if needed. As discussed in*  
28 *Section 1.3.1 of the EIS, the current capacity falls short and is heavily dependent on the aging*  
29 *Paducah Gaseous Diffusion Plant, which is not economical and expected to cease operations in*  
30 *the near future due to the high cost of maintenance.*  
31  
32

33 **Comment:** The following comments suggest that demand in the U.S. for enriched uranium will  
34 go down as the currently operating reactors are decommissioned.  
35

36 **[181-10, Roger Turner]** 1. The purpose and need analyses needs up-dated in EIS. The  
37 following conditions, in combination, eliminate the need for this project: (a) recent finds of large  
38 amounts of natural gas in the U.S. is reducing interest in nuclear power and rendering nuclear  
39 power uneconomical in comparison; (b) the cost of solar and wind power are coming down  
40 resulting in a larger role for these power sources and; (c) with the reduction of nuclear power  
41 plants in the U.S. domestic uranium enrichment plants will be able to supply the nuclear power  
42 industry with ample supplies of U-235, without the need for this proposed, expensive, AREVA  
43 plant. The aforementioned points are detailed below:  
44

45 (A) Recent finds of large amounts of natural gas fields in the U.S. reducing the interest and  
46 momentum by power companies in developing nuclear power. New finds of domestic natural  
47 gas has resulted in a switch in interest from coal and nuclear to gas for power supplies. A  
48 recent MIT study, that is more up-to-date than the study referenced in the draft EIS, reveals a



1 likely economically realistic switch to natural gas for the United States power supplies. This  
2 study, by a group of 30 MIT faculty members, researchers and graduate students reflects the  
3 more accurate conditions for power plant construction in the United States for the next 40 years.  
4 The study shows a baseline global estimate of recoverable gas resources reaching some  
5 16,200 trillion cubic feet (Tcf), enough to last over 160 years at current global consumption  
6 rates. (The Future of Natural Gas -- Study finds significant potential to displace coal, reducing  
7 greenhouse gas emissions, MIT, June 2010) In addition the study reports the following trend:  
8

9 “Natural-gas consumption will increase dramatically and will largely displace coal in the power  
10 generation sector by 2050 (the time horizon of the study) under a modeling scenario where,  
11 through carbon emissions pricing, industrialized nations reduce CO<sub>2</sub> emissions by 50 percent by  
12 2050, and large emerging economies, e.g. China, India and Brazil reduce CO<sub>2</sub> emissions by  
13 50 percent by 2070. This assumes incremental reductions in the current price structures of the  
14 alternatives, including renewables, nuclear and carbon capture and sequestration.”  
15

16 According to U.S. Energy Information Administration Annual Energy Outlook 2010, domestic  
17 and Canadian gas supply will increase, at least to 2035.  
18

19 Shale gas provides largest source of growth in U.S. natural gas supply  
20

21 The increase in U.S. natural gas production from 2008 to 2035 in the AEO-2010 Reference  
22 case results primarily from continued growth in production of shale gas, recent discoveries in  
23 deep waters offshore, and, to a lesser extent, stranded natural gas brought to market after  
24 construction of the Alaska natural gas pipeline is completed in 2023. Shale gas and coalbed  
25 methane make up 34 percent of total U.S. production in 2035, doubling their 17-percent share in  
26 2008. Shale gas is the largest contributor to the growth in production, while production from  
27 coalbed methane deposits remains relatively stable from 2008 to 2035.  
28

29 (B) The cost of solar power is lower than nuclear power, resulting in a larger role for these  
30 power sources. The New York Times reports the following article:  
31

32 Solar power costs have been declining, the costs of nuclear power have been rising inexorably  
33 over the past eight years, said Mark Cooper, senior fellow for economic analysis at Vermont  
34 Law School’s Institute for Energy and Environment. Estimates of construction costs — about  
35 \$3 billion per reactor in 2002 — have been regularly revised upward to an average of about  
36 \$10 billion per reactor, and the estimates are likely to keep rising, said Mr. Cooper, an analyst  
37 specializing in tracking nuclear power costs. (New York Times; Special Report: Energy and  
38 Environment, Nuclear Energy Loses Cost Advantage, July 26, 2010)  
39

40 (C) Switch to other power sources means no need for Areva. Given the above two examples of  
41 a switch to other power sources than nuclear, the existing plans for enrichment will be adequate  
42 to supply the U.S. nuclear industry. The Les Urenco company has plans to produce up to 6  
43 million SWU; while the USEC produces 10.5 Million SWUs.  
44

45 Also, in 2008, an amended agreement allows Russia to export increasing amounts LEU  
46 available to nuclear power companies to the United States, starting with 442,000 pounds in  
47 2011 and up to 13.7 Million pounds in 2020.  
48

1 While it is true that some nuclear plants may expand their existing power plant, such as Watts  
2 Bar 2 (TVA), there will be nowhere near the number of new units predicted by the NRC's Energy  
3 Assessment Administration Report (EIA 2009a) and nowhere near the need for SWUs  
4 referenced in the draft EIS for AREVA; and because of many nuclear plants are  
5 decommissioning -- there will be less and less need for enriched uranium. Many of the firms  
6 that initially consider nuclear construction are bound by State requirements that they be 'prudent  
7 investors'. Therefore, many initial applicants to NRC are dropping out completely, or keeping  
8 them on hold.

9  
10 Consequently, the EIS should carefully review current studies and assessments that show a  
11 general swing to natural gas, solar and wind. Unfortunately the NRC fails to take a hard look at  
12 this purported need. A nuclear power plant hasn't been built in the United States in two  
13 decades. The EIS needs to provide economic comparisons of nuclear vs. Solar and Natural  
14 Gas. More and more companies are dropping their nuclear power applications to NRC, and  
15 therefore the need for this plant is not justified, given the existing and soon to open facilities in  
16 the U.S. to provide sources of enriched uranium.

17  
18 **[187-06, John Weber]** I recommend the "no action alternative" for the following reasons. With  
19 many of the current US reactors nearing the end of the design life expectancy and very few, if  
20 any, new reactors likely to be build due to economics, a case has not been made for a need for  
21 this plant.

22  
23 **Response:** *As discussed in Sections 1.3.1 and 1.3.2 of the EIS, the need for the proposed*  
24 *EREF is based on both the projected increase in the number of U.S. commercial nuclear*  
25 *reactors and the current inadequate capacity for domestic enriched uranium production.*  
26 *Section 1.3.1 has been revised to note that most current U.S. reactors that have come, or are*  
27 *coming, to the end of their original 40-year license are undergoing a license renewal process for*  
28 *an additional 20 years of operation. Therefore, as discussed in Section 1.3.1, a net increase in*  
29 *U.S. reactors is expected, and the proposed EREF would help supply the additional enriched*  
30 *uranium required for their operation, as well as ensure that U.S. capacity for enriched uranium*  
31 *production would remain commensurate with U.S. demand.*

32  
33  
34 **Comment:** The following comments suggest that the correlation between future energy demand  
35 and the corresponding future demand for low enriched uranium is speculative.

36  
37 **[113-01, Ken Miller]** The Draft EIS in Section 1.3.1 suggests that "as future demand for  
38 electricity increases, the need for low enriched uranium to fuel nuclear power plants is also  
39 expected to increase," and they're citing the Energy Information Administration's Annual Energy  
40 Outlook in 2009. In fact, the correlation between future energy demand and the corresponding  
41 future demand for low enriched uranium today is speculative, at best.

42  
43 **[113-07, Ken Miller]** The Draft EIS in Section 1.3.1 suggests that, "As future demand for  
44 electricity increases, the need for Low Enriched Uranium to fuel nuclear power plants is also  
45 expected to increase." In fact, any correlation between future electricity demand and a  
46 corresponding future demand for Low Enriched Uranium is speculative at best. The Department  
47 of Energy does not put the nation's future electricity eggs in the nuclear basket. Far from it: It  
48 envisions a much more diverse energy portfolio that is more reliant than ever on energy  
49 efficiency and conservation and other truly renewable baseload energy resources.

1 **Response:** *The quote in these comments from Section 1.3.1 of the Draft EIS does not include*  
2 *the reference, immediately following the quote in the EIS text, that was given to*  
3 *U.S. Department of Energy’s (DOE) Energy Information Administration’s (EIA) “Annual Energy*  
4 *Outlook 2009 With Projections to 2030.” In that reference, the EIA of the U.S. Department of*  
5 *Energy (DOE) estimates the increasing need for nuclear power (and therefore, enriched*  
6 *uranium) based on an increasing need for electricity, taking into account increases from other*  
7 *sources of electric power and conservation measures.*

8  
9  
10 **Comment:** The following comments note that the proposed EREF would use a more  
11 economical and environmentally friendly uranium enrichment process.

12  
13 **[098-11, Linda Martin]** The company’s use of centrifuge technology is a proven, safe method  
14 of enriching uranium. This technology is more energy efficient, more environmentally friendly  
15 and less expensive to operate than the other accepted uranium enrichment process called  
16 gaseous diffusion.

17  
18 **[143-03, Hon. James Risch; 172-03, Amy Taylor, on behalf of Hon. James Risch]** ...I also  
19 note the centrifuge technology is proven, reliable, and efficient. The process will use 50 times  
20 less electricity than a gaseous diffusion plant, and the amount of water used by the plant is less  
21 than the current irrigation appropriation.

22  
23 **Response:** *As stated in Section 1.3.1 of the EIS, the proposed action is intended to satisfy the*  
24 *need for an additional economical domestic source of enriched uranium.*

25  
26  
27 **Comment:** The following comments support the national security goal of sufficient domestic  
28 enrichment capability.

29  
30 **[034-02, Greg Crockett]** It is time for the U.S. to change directions in the interest of our energy  
31 future and our national interest. It is time for the United States to reassume a leadership role  
32 worldwide in nuclear energy. Our national security interests require that we have enrichment  
33 and fuel development capabilities within our borders. I support the Draft Environmental Impact  
34 Statement, which likewise recognizes those demands.

35  
36 **[051-02, Jackie Flowers]** Something else this community is concerned about and cares about  
37 is energy. As this country grapples with visions for a sustainable energy future, and energy  
38 independence, we have to take action and stop the rhetoric. Nuclear energy provides  
39 20 percent of the nation’s electricity. We’ve already heard that tonight. Importantly, we’ve also  
40 heard it provides more than 69 percent of emission-free electricity that keep the lights on in this  
41 country. Let me stress, base load emission-free energy. With less than 15 percent of the nuclear  
42 fuel supply necessary for the existing nuclear energy fleet coming from a single source inside  
43 this country’s border, we have an energy security problem that I believe rallies that of our  
44 dependence on foreign oil. And this is an important step towards building that independence.

45  
46 Nuclear energy is ready now to be a central part of a balanced common-sense approach to  
47 clean energy diversity. I agree with the NRC staff’s statement that this facility will contribute to

1 the attainment of national energy security policy objectives by providing an additional reliable  
2 and economical domestic source of fuel for these important nuclear energy facilities.

3  
4 **[123-04, Hon. Butch Otter; 090-04, Paul Kjellander, on behalf of Hon. Butch Otter; 195-04,  
5 Hon. Jeff Thompson, on behalf of Hon. Butch Otter]** Third, Eagle Rock will help rebuild the  
6 nation's nuclear infrastructure, and enhance energy security for all those who depend on  
7 nuclear power for their health and welfare right here from Idaho

8  
9 **[128-09, Bob Poyser]** AREVA is really excited to be a part of Idaho's business community, and  
10 we look forward to continuing our work with the state, and the people of Southeastern Idaho.  
11 We plan to build and operate a safe environmentally sustainable world class facility that is  
12 important to America's energy security, important to our American utility customers, and  
13 important to the advancement of Idaho's continued leadership in nuclear programs. Thank you  
14 very much.

15  
16 **[133-01, Richard Provencher]** I fully support the NRC's proposed preferred alternative to build  
17 a uranium enrichment plant west of Idaho Falls, Idaho. The facility being pursued by AREVA will  
18 provide an additional reliable and economical domestic source of low enriched uranium to be  
19 used in commercial nuclear power plants. Having more capability for enrichment in this country  
20 helps reduce the risk related to importation of this type of material from foreign sources. The  
21 AREVA facilities planned capacity can provide 40% of the current and planned demand for  
22 enriched uranium. AREVA's business plan fits well within the country's plan to reduce  
23 dependency on foreign oil, improve the climate, and make nuclear energy a larger contributor to  
24 the domestic energy supply. This creates a clear mandate for the capability which is critically  
25 important to beginning the review of environmental impacts related to its operation.

26  
27 **[158-02, Hon. Mike Simpson; 139-02, John Revier, on behalf of Hon. Mike Simpson]** It is  
28 more important than ever, that our nation take the steps needed to end our dependence on  
29 foreign sources of energy and become energy independent. Currently, the United States  
30 imports nearly 90 percent of the uranium enrichment services it uses. The Eagle Rock facility  
31 will provide a stable domestic supply of enriched uranium for existing and planned commercial  
32 nuclear reactors, and it will serve an important part of an overall domestic energy strategy.

33  
34 **[163-02, Cindy Smith-Putnam]** The bigger picture is this project's significance to our regional  
35 and national energy future, and it is the national energy future that fundamentally and absolutely  
36 requires a significant reset from the status quo.

37  
38 Currently, under the E in Energy, Grow Idaho Falls has taken an active role in supporting the  
39 development and expansion of green renewable sources of energy. We can, we should, we  
40 have, and we will continue to support the diversification of the energy portfolio of our region and  
41 nation, to include harnessing the power of wind, water, heat, and light, to reduce the harmful  
42 effects to the environment of carbon emitting sources, and to promote our national security by  
43 becoming less reliant on foreign oil.

44  
45 Increasing renewables, promoting conservation, decreasing use of fossil fuels, all very  
46 important, we can, and we should do all of those things. And, yet, even taken together, none of  
47 that is enough, not nearly enough to meet our growing energy demands. Nuclear energy stands  
48 alone as the best way to produce the energy we need, while at the same time minimizing

1 harmful environmental and geopolitical consequences. It gives us the opportunity to turn away  
2 from the practices of the past toward a more stable and sustainable energy future.

3  
4 Therefore, just as we need to be independent of unstable and unpredictable sources of oil, we  
5 also need to be independent of unstable and unpredictable sources of enriched uranium. Simply  
6 put, the Eagle Rock Enrichment Facility beautifully addresses that need.

7  
8 **[171-03, John Tanner]** It is a fact that we import well more than half of the enriched uranium  
9 that we presently need, not that some future reactors might need, but that we presently need.

10  
11 Furthermore, we would like to shut down the one remaining gas diffusion enrichment plant in  
12 Paducah, Kentucky, because the gaseous diffusion is so much more inefficient than gas  
13 centrifuge technology. In fact, I think they use about 10 times as much electricity for a given  
14 amount of separation as a gas centrifuge plant does.

15  
16 Now, okay, we could import enriched uranium, but then not only the profits go abroad, but the  
17 jobs, as well. I don't think that's what we want to do.

18  
19 **[173-01, David Taylor]** ...I am strongly in favor of the construction and maintenance of the  
20 Areva complex and hope the rest of the DOE INL site can be used for productive nuclear  
21 research and generating capacity....

22  
23 We cannot supplant the energy from fossil fuels to the electric grid without vast improvements to  
24 the grid itself and to generating capacity. Nuclear is the only viable alternative and the only one  
25 that is "eco friendly" to the environment. Fear mongers and professional detractors "Snake River  
26 Alliance" use disgraceful tactics and words in attempting to keep their little source of revenue  
27 alive.

28  
29 We possess the technology (Gen IV reactors) and now need the common sense to use these  
30 resources to help sustain a vibrant economy and standard of living that we have all come to  
31 expect. The next generation will not have these opportunities if we squander and make feeble  
32 attempts to make nuclear energy production a reality now.

33  
34 I support Areva and the ideas that surround using nuclear technology as a great national effort.  
35 It must be for national security and for economic security. We must have a federal government  
36 that will establish certain protocols and reactor templates that if complied with will move to a fast  
37 track for licensing and construction. From there the government must run interference against  
38 all the special interest that come to bear only for the reason of capital extraction. Thanks for  
39 allowing us to be part of this potentially wonderful venture that will not only bless the lives of  
40 those who live and work here but for the whole nation.

41  
42 **Response:** *As stated in Section 1.3.1 of the EIS, the proposed action is intended to satisfy the*  
43 *need for an additional economical domestic source of enriched uranium.*

44  
45  
46 **Comment:** The following comments suggest that the proposed EREF is needed to address the  
47 potential short-fall in enriched uranium supply with a safe, proven, and efficient uranium  
48 enrichment process.



1 **[033-01, Hon. Mike Crapo; 075-01, Leslie Huddleston, on behalf of Hon. Mike Crapo]** Now,  
2 more than ever, it is critical to develop secure, economically feasible, and clean supplies of  
3 domestic energy. EREF will supply America's existing operation fleet of nuclear power reactors,  
4 and further augment the anticipated growth of new commercial nuclear power generation here  
5 in the U.S.  
6

7 **[034-03, Greg Crockett]** Demand for nuclear fuel is, and will dramatically increase in the  
8 future, and I think that's demonstrated by the number of pending NRC license applications. To  
9 suggest that the Eagle Rock Enrichment Facility's production is not or will not be necessary is  
10 pure folly. To meet our current demand for enriched uranium, much of it is imported, and we  
11 need robust domestic suppliers who can provide this service in an environmentally compatible  
12 manner.  
13

14 **[067-06, Mike Hart]** Also, they took exception with the cause and need for action. I think there's  
15 most definitely a need for this, because there's a need for carbon-free energy. Throughout the  
16 world, I think we've seen that global warming is a significant problem that we need to be paying  
17 attention to, and there's also a demand for growth in nuclear energy. There's a couple of facts I  
18 want to point out why we need nuclear energy, why we need this particular enrichment plant.  
19

20 Carbon dioxide reflects, or absorbs, infrared energy that does not go back out to space. It  
21 makes the planet warmer. That's simply a fact. Carbon dioxide is a greenhouse gas. Levels of  
22 carbon dioxide have gone from 288 parts per million in 1850 to 369 parts per million in the year  
23 2000. It doesn't matter where it comes from. That is a greenhouse gas that is increasing in  
24 concentration. But I'll give you a hint as to where it's coming from: fossil energy. In 1990s, we  
25 annually contribute 6.3 gigatons of carbon dioxide into the atmosphere through fossil  
26 combustion. That's annual, 6.3 gigatons. The concern about 300,000 metric tons, 300,000 tons  
27 of total waste versus 6.3 gigatons in a single year, I view the problem with carbon as much more  
28 significant than the problem with depleted uranium.  
29

30 So, what is a gigaton? Why is that a concern? Well, 2.3 gigatons is one part per million of  
31 carbon dioxide in the atmosphere. So, every year we are steadily increasing carbon dioxide. So,  
32 yes, global warming is occurring. Yes, it's our fault. Yes, carbon puts more of that in the  
33 atmosphere, and I think nuclear energy is a stopgap that will – is worth pursuing. So, yes, there  
34 is a need.  
35

36 Energy demands are increasing worldwide. Currently, the population of the planet is about  
37 4.5 billion. By 2050, that will double, and people are not less energy consumptive. Populations  
38 like China and India used to be in the Third World. They have bought the second world, and  
39 they've placed a firm down payment on the first one. So, energy consumption will go up as the  
40 population goes up, so even if nuclear energy just holds its own at 15 percent, there will be a  
41 need for more nuclear plants, and that means there will be a need for more enriched uranium.  
42

43 **[072-01, Stephen Herring]** I'd like to speak in favor of the AREVA license application for the  
44 Eagle Rock Enrichment Facility, and particularly on the need for that facility.  
45

46 This facility would be an important part of the nuclear fuel cycle, and a key step in providing for  
47 future electricity. In building this facility, AREVA will replace 60-year old technology for uranium  
48 enrichment, that is, the gaseous diffusion process, with the new gas centrifuge technology,

1 which is more proliferation-resistant, cleaner, and a factor of 20 to 50 times more energy  
2 efficient.

3  
4 The 104 reactors in the United States provide, as you've heard earlier this evening, about  
5 20 percent of the total U.S. electricity, and about 70 percent of the carbon-free electricity.  
6 However, today the U.S. has only one operating gas centrifuge plant, and the last gaseous  
7 diffusion plant is in the process of being decommissioned. The one gas centrifuge plant in New  
8 Mexico began operation in June 2010, and will be capable of producing 3 million separative  
9 work units per year, which is about 25 percent of the U.S. need for enrichment. So, the U.S. is  
10 importing, from one place or another, the enrichment needed for 75 percent of our nuclear  
11 electricity.

12  
13 We have seen the construction of many wind turbines in the hills east of Idaho Falls in the last  
14 five years, and throughout the west. I applaud the contribution that these turbines can make,  
15 though I have seen very little contribution from Jackson or Sun Valley, but it is important to  
16 remember that these turbines, even at the best wind sites, have capacity factors of only 30 to  
17 35 percent. A nuclear reactor's fuel by means of the Eagle Rock Enrichment Facility will provide  
18 power with a capacity factor of above 90 percent; that is, they will produce 90 percent of their  
19 maximum power for an average, year-round, 24/7. The U.S. needs reliable, sustainable energy  
20 for the decades to come, and not just when the winds blow.

21  
22 **[098-04, Linda Martin]** As far as technical impacts, the centrifuge technology is proven and  
23 safe as based on other facilities across the world, and while there conceivably is a significant  
24 gap in the supply-demand equation for enriched uranium to provide our current and future green  
25 energy needs, we can address that with the EREF.

26  
27 **[098-13, Linda Martin]** Conceivably there is a significant gap in the supply/demand equation  
28 for enriched uranium to provide for our current and future green energy needs. The uncertainty  
29 of the future supply of energy could evolve into a national security issue. The Eagle Rock  
30 Enrichment Facility would be a principal supplier for this valuable and needed material.

31  
32 **[123-02, Hon. Butch Otter; 090-02, Paul Kjellander, on behalf of Hon. Butch Otter; 195-02,**  
33 **Hon. Jeff Thompson, on behalf of Hon. Butch Otter]** AREVA is proposing to build a state-of-  
34 the-art, technologically-proven, modern facility to enrich uranium needed to operate the existing  
35 U.S. fleet of 104 power reactors. AREVA's plant will incorporate many unique features which  
36 have been developed over three decades of experience with centrifuge enrichment technology.  
37 AREVA's vast experience and use of the technology will result in minimizing and, where  
38 possible, eliminating any impacts on the surrounding environment and regional communities,  
39 but there will remain, however, many significant beneficial impacts....

40  
41 Safety, integrity, professionalism, and sustainability are demonstrated attributes that AREVA  
42 embraces in all of its projects and operations, and the Governor believes they'll bring no less to  
43 Idaho Falls. AREVA has been easy to work with, and they are as excited about coming to Idaho  
44 as we are to have them locate their facility here.

45  
46 As we look across the country today, there are not many, if any, states or regions that can claim  
47 proposed major energy construction projects or facilities like the Eagle Rock Enrichment  
48 Facility. While large projects are usually accompanied by some environmental impacts,  
49 Governor Otter believes the end result of this facility will be very positive for Idaho and the

1 country. Eagle Rock will provide much needed domestic production of enriched uranium for our  
2 existing U.S. nuclear power fleet, which will help enable U.S. utilities to move away from  
3 importing nearly 90 percent of this important fuel product.  
4

5 **[128-03, Bob Poyser]** This is a project that AREVA's American utility customers have  
6 embraced, as demonstrated by their willingness to already contract, in advance, for more than  
7 half of the production capacity of this facility.  
8

9 All of the natural uranium that will arrive at the Eagle Rock facility under these contracts belong  
10 to American utilities, and is destined for use in American reactors.  
11

12 I would quickly like to address just a few of key aspects of the EIS, and the Eagle Rock facility.  
13

14 Let me start by saying that a clear and definite need, today, in the United States, for enrichment  
15 services exists. Today, more than half of the enriched material for America's current nuclear  
16 plant plants is imported from Russia. Another one third is imported from other nations, and  
17 Eagle Rock and Idaho will help significantly reduce America's dependence on these foreign  
18 sources of supply.  
19

20 Nevertheless, when Eagle Rock comes online, America will need to import enrichment services  
21 just to fulfill the need for the current existing fleet of 104 reactors.  
22

23 **[130-01, Park and Sharon Price]** We support the NRC assessments regarding the potential  
24 impacts named in the draft EIS and agree with the findings that the impacts are small to  
25 moderate. The need for an enrichment facility as proposed by AREVA is long overdue. The  
26 importance of increasing the production of power by nuclear generation is vital to the United  
27 States.  
28

29 **[143-01, Hon. James Risch; 172-01, Amy Taylor, on behalf of Hon. James Risch]** As a  
30 U.S. Senator from Idaho, I have the privilege of serving as the Ranking Member of the  
31 Subcommittee on Energy. From that position, I have seen firsthand the efforts this country is  
32 making to formulate a forward-looking energy policy. Supporting nuclear power, and its  
33 associated technologies, such as enrichment, is one way to make our country more energy  
34 secure.  
35

36 Years of broken energy policy have led us to become dependent on foreign sources of energy.  
37 We've also lost our competitive edge in the nuclear field a field where the United States and  
38 Idaho once led. This community knows what it takes to regain that competitive edge, and once  
39 again place Idaho and this nation at the pinnacle of the nuclear industry.  
40

41 There is a growing recognition that nuclear power is the most viable option to meet the clean  
42 energy demands of the future. Demand for enriched uranium is increasing in the United States  
43 and across the world to fuel clean nuclear power. This proposed facility will allow that need to  
44 be met from domestic sources, while providing a much needed economic boost to the entire  
45 region.  
46

47 **[145-04, Ann Rydalch]** As you know, nuclear power currently supplies about 20 percent of the  
48 nation's electricity, and surveys show over 70 percent of the public throughout the nation  
49 support nuclear energy. We have one company that is currently the sole U.S. supplier of low-

1 enriched uranium for nuclear fuel in the U.S., although there are some being built that may  
2 provide enrichment services in the future. However, that still leaves an extremely high percent of  
3 low-enriched uranium that is being imported from foreign suppliers, imposing reliability risks for  
4 the nuclear fuel supply to U.S. nuclear power plants.

5  
6 National energy policy emphasizes the importance of having a reliable domestic source of  
7 enriched uranium for national energy security. The production of enriched uranium at the Eagle  
8 Rock Enrichment Facility would be equivalent to about 40 percent of the current and projected  
9 demand for enrichment services within the U.S. Thus, still a high percent of current and  
10 projected demand for enrichment services that's left to fulfill.

11  
12 **[157-10, Hon. Erik Simpson]** Need for an enrichment facility. At the Boise hearing that I  
13 attended on Monday, those opposed to this project said there is no need for additional uranium  
14 enrichment. They quoted a so-called expert from the Vermont School of Law who said, "The  
15 nuclear renaissance is dying."

16  
17 Now, at my count, currently there are 468 nuclear power plants planned around the world,  
18 including 26, give or take, in the United States. This does not sound like a dying renaissance to  
19 me. It is important the United States to continue to be a world leader in nuclear power  
20 development and research. The Eagle Rock Enrichment Facility and the Idaho National  
21 Laboratory will help continue this nuclear renaissance.

22  
23 **[176-04, Hon. Jeff Thompson]** Additionally, the Eagle Rock plant will enrich uranium for use  
24 as fuel for the nuclear reactors, which today accounts for 20 percent of U.S. electricity.

25  
26 **Response:** *As stated in Section 1.3.1 of the EIS, the proposed action is intended to satisfy the*  
27 *need for an additional economical domestic source of enriched uranium.*

28  
29  
30 **Comment:** The following comments question the location of the proposed EREF in Idaho  
31 because nuclear power is not needed in Idaho.

32  
33 **[015-13, Beatrice Brailsford]** There is, of course, another aspect to "purpose and need," and  
34 that's the local rationale: why is this project proposed for this location. Here, too, the draft EIS  
35 comes up short. We are told that nuclear reactors that would theoretically be supplied in part by  
36 EREF are needed because of our need for non-coal "baseload" or "firm" generation resources.  
37 In fact, nuclear power is not being considered at all as a baseload resource here in Idaho. Our  
38 region's Sixth Power Plan, developed by the Northwest Power and Conservation Council and  
39 vetted by utilities and energy officials in Idaho and throughout our region, projects that we will  
40 meet 85 percent of our new electric load growth over the next 20 years through energy  
41 efficiency, with the balance coming primarily from renewable generation, mostly from wind. Our  
42 region's Power Plan does not anticipate any new large supply-side generation resources,  
43 including nuclear.

44  
45 **[025-04, Hon. Sue Chew]** And, you know, we've heard that the energy that would be  
46 developed through this particular mechanism doesn't benefit our state. I'd like for us to reflect on  
47 that.

1 **[032-01, Cindy Cottrell]** I am writing about my deep concerns of the proposal to open Areva  
2 uranium enrichment plant in Idaho. This would be a big mistake. Of all the States in the United  
3 States this should be the last State ever considered to take on such a plant. First of all, Idaho is  
4 one of the few States who doesn't need nuclear power. We have all kinds of options for  
5 alternative energy. A State like Rhode Island may need to consider such options but Idaho  
6 should never be accepting energy that creates waste when there are other options. We have  
7 thermal resources to tap, wind power, dams, and some solar. I'm sure more are options too  
8 since we live in a large State with a variety of resources.

9  
10 **[113-08, Ken Miller]** We are told that nuclear reactors that would theoretically be supplied in  
11 part by EREF are needed because of our need for non-coal "baseload" or "firm" generation  
12 resources. In fact, nuclear is not being considered at all as a baseload resource - here in Idaho  
13 and at regulated electric utilities, at least. Our region's Sixth Power Plan, developed by the  
14 highly regarded Northwest Power and Conservation Council and vetted by utilities and energy  
15 officials in Idaho and throughout our region, projects that we will meet 85 percent of our new  
16 electric load growth over the next 20 years through energy efficiency, with the balance coming  
17 primarily from renewable generation, mostly from wind. Our region's Power Plan does not  
18 anticipate any new large supply-side generation resources, including nuclear.

19  
20 **Response:** *The location of the proposed EREF was not chosen by AES based on the need for*  
21 *nuclear power in Idaho. The determination of the proposed EREF location is based on the*  
22 *criteria identified in Section 2.3.1 of the EIS, which include factors related to geology, hydrology,*  
23 *weather, required resources, available workforce, and local acceptance. The NRC reviewed*  
24 *AES's site selection criteria and selection process as part of its environmental review.*

25  
26  
27 **Comment:** The following comments indicate that the justification for domestically enriched  
28 uranium is unsupported.

29  
30 **[015-23, Beatrice Brailsford]** In conclusion, since the only justification for the facility is an  
31 asserted but unsupported need for domestically produced enriched uranium, which the EREF  
32 does not in any case provide, a true "no action" alternative - without any preconstruction  
33 activities - should be chosen.

34  
35 **[153-14, Andrea Shipley; 161-03, Marisa Smith; 197-16, Andrea Shipley, on behalf of the**  
36 **Snake River Alliance]** In conclusion, since the only justification for the facility is an asserted  
37 but unsupported need for domestically produced enriched uranium, which the EREF does not in  
38 any case provide, a no action alternative should be chosen.

39  
40 **[100-05, Wendy Matson]** So therefore, I feel, very strongly, that since the only justification for  
41 the facility is an asserted by unsupported need for domestically-produced enriched uranium,  
42 which EREF does not, in any case provide. I vote for a no action alternative.

43  
44 **[110-01, John and Susan Medlin]** As the Snake River Alliance presentation pointed out, there  
45 is no current need for this facility, no compelling evidence that a nuclear renaissance is coming  
46 (or inevitable), no rationale for a French company building a nuclear facility in Idaho that  
47 purports to promote US energy security while importing inputs and exporting outputs, no  
48 provision for the deteriorating and dangerous waste that will haunt us for decades or maybe



1 forever, no concern for yet another threat to the Snake River aquifer, the lifeblood of Idaho  
2 agriculture.

3  
4 So how can the NRC conclude that building this facility is vital, and that the most problematic  
5 outcome to be evaluated is construction dust?

6  
7 **[131-03, Morty Prisament]** Need for Action: The DEIS has not established a “need” for this  
8 action, as required under NEPA. Need is required to be discussed in specific, quantitative,  
9 terms and within the scope of global production and markets. there exists a competitive global  
10 market to provide enriched uranium. Russia (CIS) has been one of the leading suppliers of  
11 enriched U2. If there is a national security rationale for building such facilities in the U.S., the  
12 EIS needs to discuss and document such an assertion. Moreover, the document needs to  
13 explore the reasons why the supply of enriched U2 from nuclear weapons decommissioning  
14 could not meet projected demand for enriched U2.

15  
16 **[148-02, Eric Schuler]** But there’s a bigger issue here. Before we can ask whether the impact  
17 will be small or devastating, we need to ask why we’re making an impact at all. This question is  
18 paramount, but the draft EIS failed to provide a convincing answer. The EIS claims that the  
19 EREF needs to be build to improve national security. For this to be a legitimate need, however,  
20 the U.S.’s supply of enriched uranium would have to be unreliable currently. This is not the  
21 case.

22  
23 The U.S.’s enriched uranium sources are reliable partners and the U.S. even seems to tacitly  
24 acknowledge this fact, when it states that some of the enriched uranium will be exported to  
25 foreign countries. Even so, it is useful to evaluate the sources more fully, just to understand just  
26 how unnecessary this facility is.

27  
28 Now we’ve heard earlier that 90 percent of our enriched uranium is imported, and about half of  
29 that is from Russia, and we’ve also heard that uranium enrichment is a necessary technology  
30 because we need nuclear power to deal with global warming.

31  
32 However, strictly speaking, that’s not true, as a great example of that is the megatons to  
33 megawatts program that we operate with Russia. This is an agreement between Russia and the  
34 U.S. where by Russian nuclear warheads are downblended to make fuel grade uranium, and  
35 thus, since we have an abundant supply of warheads, is a very bountiful source of this  
36 enrichment – or of enriched uranium. Moreover, this program diminishes the threat of  
37 proliferation and prevents the environmental degradation associated with continued mining.

38  
39 In other words, it’s beneficial in many ways, and it’s been existing for several years and there is  
40 no reason to expect that it would not be renewed in the future.

41  
42 The other enriched uranium sources are also reliable. Although much of the enriched uranium  
43 is, indeed, imported, this fact alone does not indicate instability. We live in an age of  
44 globalization and there is no international market for enriched uranium. Credit counseling with a  
45 comparative advantage in the production of enriched uranium, whether because they have  
46 highly-accessible reserves, low-cost labor in Africa, or other factors, will specialize in producing  
47 enriched uranium while the U.S. focuses its resources in other areas, like agriculture.

1 Our reliance on this marked is not a sign of weakness or vulnerability, but a sign of efficiency.  
2 Energy independence is an outdated idea, is one that is not based on security or patriotism, but  
3 of ignorance.  
4

5 The current system works, and has worked for several years. The entire project that we are  
6 discussing here tonight is predicated on the assertion that it will provide national energy security  
7 with respect to enriched uranium.  
8

9 The fact of the matter is that this security already exists and the EREF facility is not necessary,  
10 and if the benefits stated in this proposal do not exist, no amount of environmental impact is  
11 tolerable, and this facility cannot be licensed.  
12

13 **[182-01, Brianna Ursebach]** The EIS states the facility is necessary for U.S. energy security;  
14 however, this argument is based on the unstated and unproven premise that the U.S. must have  
15 domestic sources for all of its nuclear fuel needs.  
16

17 **[184-22, Kitty Vincent]** In conclusion, since the only justification for the facility is an asserted  
18 but unsupported need for domestically produced enriched uranium, which EREF does not in any  
19 case provide, a “no action” alternative should be chosen.  
20

21 **[191-04, Liz Woodruff]** After reviewing the draft EIS in full, I believe it inadequately addressed  
22 may critical issues and must be revised to integrate the following concerns. Most importantly,  
23 the entire premise of the draft EIS, that there is a need for domestically supplied enriched  
24 uranium, is deeply flawed, fully hypothetical, repeatedly contradicted and disproven in the draft  
25 EIS itself, and an unacceptable warrant for the licensing of this facility. The NRC must either find  
26 legitimate warrants for taking the proposed action that actually outweigh the environmental and  
27 public health risks associated with this facility, or they must choose the “no action alternative”  
28 and not license the proposed EREF.  
29

30 **[191-19, Liz Woodruff]** Alternatives

31 • Since the only justification for the facility is an asserted but unsupported need for domestically  
32 produced enriched uranium, which the EREF does not in any case provide, a “no action”  
33 alternative should be chosen.  
34

35 **[193-06, Liz Woodruff, on behalf of the Snake River Alliance]** First, the purpose and need  
36 for this facility is not proven in the draft Environmental Impact Statement, for either current or  
37 new reactors. It’s inadequately proven. It remains to be a hypothesis.  
38

39 **Response:** *National energy policy issues are not within the scope of the EIS for the proposed*  
40 *EREF. The proposed action is intended to satisfy the need for an additional reliable and*  
41 *economical domestic source of enriched uranium.*  
42

43  
44 **Comment:** The following comments assert that there is no need for the proposed EREF  
45 because an adequate supply of enriched uranium is and will be available, and that construction  
46 and operation of the proposed facility would only result in an excess supply of domestically  
47 enriched uranium.  
48

1 [009-02, Steve Barclay; 021-02, Linda Cannarozzo; 081-02, Lea Johnson; 161-02, Marisa  
2 Smith; 202-02, Alison Duffin; 205-02, Andrea Guerri; 206-02, Pamela Hanson; 209-02,  
3 Courtney Hollar; 210-02, Tyler Hoovis; 211-02, Olivia Joelson; 212-02, Naomi Johnson;  
4 215-02, Verlyn Larsen; 217-02, Jodie Mckelvey; 222-02, Hannah Raines; 224-02, A.  
5 Rolsen; 225-02, Lisa Stimpson] The draft EIS makes an unproven assertion that there is a  
6 need for domestically produced enriched uranium. However, this claim was never proven and  
7 often contradicted in the draft. 1) The nuclear renaissance is too expensive and faces enormous  
8 delays; 2) the current US fleet of reactors has operated with an adequate supply of fuel for  
9 decades; 3) the draft EIS asserts that the licensing of this facility would create a supply of  
10 enriched uranium in excess of the need.

11  
12 [015-01, Beatrice Brailsford] According to the current Draft EIS, the purpose of AREVA's  
13 enrichment factory is to meet two needs, for enriched uranium to fulfill electricity generation  
14 requirements, and for domestic supplies of enriched uranium for national energy security. That  
15 first need, enriched uranium for electricity generation is undeniably true, as long as the majority  
16 of nuclear reactors use low enriched uranium fuel, but the Draft EIS does not even attempt to  
17 make the case that that need is not already being met.

18  
19 Furthermore, the draft clearly acknowledges that even if the nuclear renaissance occurs as  
20 advertised, already planned new enrichment would exceed U.S. demand by about the same  
21 amount as AREVA's factory might produce.

22  
23 [015-08, Beatrice Brailsford] One of the most important parts on an EIS is the examination of  
24 the purpose and need for the proposed action. According to the current draft EIS, the purpose  
25 of Areva's Eagle Rock Enrichment Factory is to meet two needs: 1) The need for enriched  
26 uranium to fulfill electricity generation requirements; and 2) the need for domestic supplies of  
27 enriched uranium for national energy security.

28  
29 That first "need" - enriched uranium for electricity generation - is undeniably true as long as the  
30 majority of nuclear reactors use low-enriched uranium fuel. But the draft EIS does not even  
31 attempt to make the case that that need is not already being met. It must do so. The draft does,  
32 however, state "Based on the projected need for LEU by existing reactors and proposed new  
33 reactors, with the target capacity of 6.6 million SWUs per year for the proposed EREF, the total  
34 enrichment capacity in the United States would exceed the projected demand (approximately  
35 16 million SWUs per year) by about 6 million SWUs per year if all of the enrichment facilities  
36 were constructed and operated at their rated capacities" (Draft EIS, 1-6). Thus, even if the  
37 "nuclear renaissance" occurs as advertised, which is not at all certain, already planned new  
38 enrichment would exceed US demand by about the same amount as Areva's factory is slated to  
39 supply.

40  
41 [030-05, Kerry Cooke] Lack of need: The world already has redundancy in provision of  
42 enriched uranium for nuclear plants. With additional enrichment facilities already approved or  
43 under construction, the Areva facility would far exceed any expected need for more enriched  
44 uranium, in the US and elsewhere. The idea that a new wave of nuclear reactors will demand  
45 increased enriched uranium is based on unsubstantiated and wishful prognoses by the nuclear  
46 industry. As is playing out every day in the financial market, financiers are shying away from this  
47 industry that is risky at all levels: cost, market need, and remuneration, to name three. This  
48 plant should be denied until and unless there is solid proof that there is a need.

1 **[068-01, Anne Hausrath]** I do not believe that we have been provided with sufficient evidence  
2 of a need for domestically-produced uranium, enriched uranium.  
3

4 **[071-03, David Hensel]** I think that, I don't mean to be unkind, but I don't think you did a very  
5 good job of looking at a very good market analysis. And here I'm going to quote from the  
6 Nuclear Engineering International, November 2009. And I'm assuming these guys aren't  
7 appearing for Greenpeace. I mean, I don't necessarily read this magazine, but if I could quote  
8 once again, they talk about "enrichment requirements for the world's growing fleet of nuclear  
9 power plants are expected to expand significantly. Current enrichment capacity on a worldwide  
10 basis is just sufficient to meet those requirements." And this is what I want to highlight, "but the  
11 potential pace of enrichment capacity expansion is expected to outstrip the growth  
12 requirements." So, we use this language of we want to be energy independent. I mean, and  
13 that's sort of -- I mean, it's a meaningless term.  
14

15 **[086-02, Paula Jull]** A new US plant to enrich uranium for electricity production is not needed.  
16 Current supplies are clearly adequate, and already operating or planned new enrichment  
17 capacity would exceed US demand by about the same amount as Areva's plant might produce.  
18

19 **[088-02, Stan Kidwell]** Current supplies of enriched uranium are more than adequate, and  
20 already operating or planned new enrichment capacity would exceed US demand by about the  
21 same amount as Areva's plant might produce, even if a nuclear renaissance occurs.  
22

23 **[095-02, Linda Leeuwrik]** • There is no need for a new US plant to enrich uranium for  
24 electricity production. Current supplies are clearly adequate.  
25

26 **[096-05, Arjun Makhijani]** ...but I can tell you, simple calculation that the treaty that the U.S.  
27 and Russia have signed, if that enriched uranium on both sides is used, plus LES, plus  
28 Portsmouth, plus a couple of years of operation of Paducah before it is shut down will provide  
29 far more enrichment services than the entire lifetime, so what might happen here is, for the  
30 entire U.S. reactor fleet, so you may be building a plant here that may wind up only exporting  
31 enriched uranium, if there is a market.  
32

33 **[103-02, Karen McCall]** "The potential pace of enrichment capacity expansion is expected to  
34 out-strip the growth requirements." Nuclear engineering International , November 2009  
35

36 **[113-06, Ken Miller]** First and foremost and as to the need for this facility, I do not believe  
37 Areva's application contains a sound justification for this facility. Not only is there an adequate  
38 existing supply of enriched uranium to meet current and expected needs of the U.S. domestic  
39 nuclear reactor fleet, that capacity would exceed demand roughly by the amount of enriched  
40 uranium EREF would produce.  
41

42 **[118-04, Caroline Morris]** The draft EIS too asserts without proof a greater need for  
43 domestically produced enriched uranium, Yet the document then contradicts the claim by these  
44 factors showing no need for the EREF: 1) the enormous expense and delays of the US nuclear  
45 renaissance, 2) decades of adequate fuel supply for currently operating the US reactors, and  
46 3) creating an excess supply of enriched uranium by the licensing this proposed facility. Since  
47 the only justification given for EREF, the asserted, unsupported need for more domestically  
48 produced enriched uranium, is fallacious, a "no action" alternative should be chosen.  
49

1 **[120-03, Frank Nicholson]** This enrichment factory: • Is unnecessary. We were told it was for  
2 national consumption but as there is not that much demand, the finished product will be sent  
3 overseas no matter what they promise.  
4

5 **[122-03, Kathy O'Brien]** I understand that there is no need for a new US plant to enrich  
6 uranium for electricity production. Current supplies are adequate, so it seems that this plant may  
7 be useless as well as dangerous.  
8

9 **[168-08, Lon Stewart]** Nuclear engineering periodicals are claiming the world has plenty of  
10 enrichment capacity.  
11

12 **[175-03, Ellen Thomas]** There is no need for a new US plant to enrich uranium for electricity  
13 production. Current supplies are clearly adequate, and as we develop healthy solar, wind, tidal  
14 and other truly clean energy systems, there is no need for new nuclear power plants.  
15

16 **[180-11, Kaye Turner]** Is it possible we may not need this enriched uranium Areva wants to  
17 produce?  
18

19 **[183-06 and 183-14, James Vincent]** In conclusion, the EIS (4-136) states the French  
20 company, AREVA's enriched product will be shipped overseas as is their profits. I do not see  
21 how this proposed project will make my country have any more domestic control over our needs  
22 for enriched fuel. The EIS specifies that the numbers of license requests for new enriched  
23 uranium, EIS 1-6, are in excess of the need for the new enriched uranium. Given the potential  
24 for accidents is considerable, I would urge the Nuclear Regulatory Commission to deny this  
25 permit at this time. I would also like to thank the Commission for hearing my testimony.  
26

27 **[191-07, Liz Woodruff]** The draft EIS fails to establish that the current approach to supplying  
28 enriched uranium is unreliable. There is uranium enrichment in the US, enriched uranium has  
29 always been an international market, the raw material comes from foreign sources, and this  
30 system has adequately provided fuel for US reactors for decades.  
31

32 **[191-09, Liz Woodruff]** The EIS specifies that the numbers of license requests for new  
33 enrichment facilities in the US are in excess of the need for new enriched uranium (draft EIS,  
34 1-6). The EIS does not adequately prove that the Areva facility is necessary.  
35

36 **[193-08, Liz Woodruff, on behalf of the Snake River Alliance]** Third, there's currently  
37 enough enriched uranium for domestic use, and AREVA is a French company and gets it  
38 uranium supply from the international market. So how does this facility give us a more reliable  
39 source of domestically-produced uranium, enriched uranium?  
40

41 **[193-14, Liz Woodruff, on behalf of the Snake River Alliance]** The NRC acknowledges that  
42 the licensing if this facility is in excess of the need by 6 million SWUs.  
43

44 **[192-06, Lisa Young]** Perhaps if this facility was necessary and urgent, these risks could be  
45 ignored. But it's clear that we do not need this facility. The current system and sources for  
46 enriched uranium have provided adequate fuel for reactors for decades, and with a total of three  
47 enrichment facilities expected in the U.S. in the nature future, one already in operation and two  
48 that are being constructed right now, the need for more enriched uranium is nonexistent.  
49



1 This enriched uranium will be shipped overseas, leaving the dangerous waste in Idaho for at  
2 least 30 years and potentially much longer. There's no need to take these risks at this time and  
3 the EIS unfairly represents these risks.

4  
5 Producing this waste is irresponsible and my sense is this facility is irresponsible. Thanks.  
6

7 **[192-12, Lisa Young]** Perhaps if this facility was necessary and urgent, these risks could be  
8 ignored or set aside, but it is clear that we do not need this facility: the current system and  
9 sources for enriched uranium have provided adequate fuel for reactors for decades, and with a  
10 total of 3 enrichment facilities expected in the U.S. in the near future (1 already in operation,  
11 2 being constructed), the "need" for more enriched uranium is non-existent. This enriched  
12 uranium would be shipped overseas, leaving this dangerous waste in Idaho for at least  
13 30 years, and potentially much longer. No, there is no need to take these risks at this time, and  
14 the EIS unfairly represents these risks. Producing this waste is irresponsible and my sense is  
15 this facility is irresponsible.  
16

17 **Response:** *As pointed out in Section 1.3.1 of the EIS, the need for the proposed EREF includes*  
18 *the need for domestically produced enriched uranium. The only currently operating uranium*  
19 *enrichment facilities in the United States are the Paducah Gaseous Diffusion Plant (PGDP) and*  
20 *URENCO USA (formerly known as the NEF). The operation of the PGDP is expected to cease*  
21 *in the near future due to costs associated with maintaining an aging facility and the inefficiency*  
22 *of the gaseous diffusion process compared to newer technologies such as uranium enrichment*  
23 *using centrifuges. The URENCO USA facility is currently under construction, but started initial*  
24 *operations in June 2010; it is expected to reach a capacity of 1.6 million SWUs per year in*  
25 *August 2011 (about half of its full capacity of approximately 3 million SWUs per year, as*  
26 *currently licensed by the NRC). Full licensed capacity would not be reached until sometime*  
27 *later. An expansion to 5.9 million SWU per year is being considered by URENCO USA, but an*  
28 *application for the expansion has not yet been submitted to the NRC. As discussed in*  
29 *Section 1.3.1, of the other potential domestic sources of enriched uranium, the American*  
30 *Centrifuge Plant (ACP) is not yet in operation and the GE-Hitachi Global Laser Enrichment LLC*  
31 *(GLE) Facility is not yet licensed.*  
32

33 *The decrease in an inadequate supply of enriched uranium for domestic reactors, due to the*  
34 *eventual shutdown of the PGDP and the end of the Megatons to Megawatts Program, together*  
35 *with increased domestic and global demand, emphasize the need for more domestic capacity.*  
36 *As noted in Section 1.3.1, the NRC is currently processing license applications for more than*  
37 *20 nuclear plants. The availability of foreign enriched uranium is expected to become more*  
38 *competitive with the global expansion of nuclear power. Within the last 10 years, 32 nuclear*  
39 *plants have become operational, with 60 additional nuclear plants currently under construction*  
40 *(IAEA 2010) including one in the United States.*  
41  
42

43 **Comment:** The following comments assert that it is not clear that new nuclear reactors will be  
44 constructed in the United States, thereby increasing the domestic need for enriched uranium.  
45

46 **[009-02, Steve Barclay; 021-02, Linda Cannarozzo; 081-02, Lea Johnson; 161-02, Marisa**  
47 **Smith; 202-02, Alison Duffin; 205-02, Andrea Guerri; 206-02, Pamela Hanson; 209-02,**  
48 **Courtney Hollar; 210-02, Tyler Hoovis; 211-02, Olivia Joelson; 212-02, Naomi Johnson;**

1 **215-02, Verlyn Larsen; 217-02, Jodie Mckelvey; 222-02, Hannah Raines; 224-02,**  
2 **A. Rolsen; 225-02, Lisa Stimpson]** The draft EIS makes an unproven assertion that there is a  
3 need for domestically produced enriched uranium. However, this claim is never proven and  
4 often contradicted in the draft. 1) The nuclear renaissance is too expensive and faces enormous  
5 delays; 2) the current US fleet of reactors have operated with an adequate supply of fuel for  
6 decades 3) the draft EIS asserts that the licensing of this facility would create a supply of  
7 enriched uranium in excess of the need.  
8

9 **[030-05, Kerry Cooke]** Lack of need: The world already has redundancy in provision of  
10 enriched uranium for nuclear plants. With additional enrichment facilities already approved or  
11 under construction, the Areva facility would far exceed any expected need for more enriched  
12 uranium, in the US and elsewhere. The idea that a new wave of nuclear reactors will demand  
13 increased enriched uranium is based on unsubstantiated and wishful prognoses by the nuclear  
14 industry. As is playing out every day in the financial market, financiers are shying away from this  
15 industry that is risky at all levels: cost, market need, and remuneration, to name three. This  
16 plant should be denied until and unless there is solid proof that there is a need.  
17

18 **[110-01, John and Susan Medlin]** As the Snake River Alliance presentation pointed out, there  
19 is no current need for this facility, no compelling evidence that a nuclear renaissance is coming  
20 (or inevitable), no rationale for a French company building a nuclear facility in Idaho that  
21 purports to promote US energy security while importing inputs and exporting outputs, no  
22 provision for the deteriorating and dangerous waste that will haunt us for decades or maybe  
23 forever, no concern for yet another threat to the Snake River aquifer, the lifeblood of Idaho  
24 agriculture.  
25

26 So how can the NRC conclude that building this facility is vital, and that the most problematic  
27 outcome to be evaluated is construction dust?  
28

29 **[118-04, Caroline Morris]** The draft EIS too asserts without proof a greater need for  
30 domestically produced enriched uranium, Yet the document then contradicts the claim by these  
31 factors showing no need for the EREF: 1) the enormous expense and delays of the US nuclear  
32 renaissance, ...  
33

34 **[131-04, Morty Prisament]** Finally, the document's projected demand for U2 is based upon  
35 certain scenarios regarding future nuclear energy power plants. This scenario needs to be  
36 defined in far greater detail and, further, the document needs to present alternative scenarios in  
37 recognition of that alternative public policy decisions, domestically and globally, are equally  
38 likely. A multitude of factors can influence these projections, including economics of nuclear  
39 power as compared to alternatives, resolution of nuclear waste storage issues, liability issues,  
40 system safety issues, proliferations concerns, and governments' ability and willingness to  
41 provide funding (i.e.; loan guarantees, subsidies, excess liability coverage, etc.) to support  
42 nuclear energy development.  
43

44 **[153-05, Andrea Shipley; 197-05, Andrea Shipley, on behalf of the Snake River Alliance]**  
45 Not to mention that the EIS claims that the need for AREVA's enriched uranium will be spurred  
46 by the building of a fleet of reactors. Economic costs, delays, and safety issues all indicate that  
47 this supposed renaissance is not only improbable, but unlikely.  
48

1 **[169-01, Margaret Stewart]** And aside from AREVA's greed, grim, and very, very devastating  
2 global environmental and human rights record around the world, particularly in Africa, I  
3 vehemently oppose the NRC licensing of this facility on grounds that the facility has not been  
4 proven necessary, a huge amount of dangerous radioactive waste that would be created has no  
5 disposal place, the nuclear reactors that the EIS says will need AREVA's product more than  
6 likely will never be built.

7  
8 **[169-03, Margaret Stewart]** This Draft EIS appears to be based on the unproven assumption  
9 that there will be a large number of nuclear reactors built needing AREVA's product. Given that  
10 we all live in a globally threatened economic world, where scarce monies are ever-shrinking,  
11 there are ever-present reactor construction delays, safety questions unanswered, and spiraling  
12 out of control costs, these assumptions seem dubious, at best.

13  
14 **[181-04, Roger Turner]** So, this brings to mind the other error in this EIS in assuming a need  
15 for enrichment based on new nuclear power plants in the United States. Unfortunately, the  
16 NRC fails to take a hard look at this purported need. A nuclear power plant hasn't been built in  
17 the United States for two decades. The fact is, most states and power companies don't want  
18 nuclear power plants with their high cost, especially the high cost of spent fuel storage and  
19 cleanup. Especially considering that there's no permanent repository. The emphasis may be for  
20 less nuclear, given the problems with waste, and the fact the higher cost that these states and  
21 power companies must endure, because there isn't a permanent repository.

22  
23 The final EIS should more carefully evaluate and revise the projected need for this plant. The  
24 fact is, there's not general support in the U.S. for new nuclear power plants to the extent that  
25 warrants this project, and other sources of enriched uranium meets our needs....

26  
27 **[187-06, John Weber]** I recommend the "no action alternative" for the following reasons. With  
28 many of the current US reactors nearing the end of the design life expectancy and very few, if  
29 any, new reactors likely to be build due to economics, a case has not been made for a need for  
30 this plant.

31  
32 **[191-11, Liz Woodruff]** The EIS claims that the need fulfilled by the Areva facility will be  
33 spurred by the building of a new fleet of reactors. Economic costs, delays, and safety issues all  
34 indicate that this supposed resurgence is not only improbable, but unlikely.

35  
36 **[193-09, Liz Woodruff, on behalf of the Snake River Alliance]** And finally, the draft EIS  
37 claims the need for AREVA's enriched uranium will be spurred by the building of a new fleet of  
38 reactors. But economic cost delays and safety issues all indicate the supposed renaissance is  
39 unlikely.... And we would argue that this is not in fact a renaissance. That the very premise of  
40 the EIS is incorrect. We're actually set up for a collapse of the nuclear power industry.

41  
42 **Response:** *As discussed in Section 1.3.1 of the EIS, the NRC expects to license the next*  
43 *generation of nuclear power plants using 10 CFR Part 52. Part 52 governs the issuance of*  
44 *standard design certifications (DCs), early site permits (ESPs), and combined licenses (COLs)*  
45 *for nuclear power plants. The NRC staff is engaged in numerous ongoing interactions with*  
46 *vendors and utilities regarding prospective new reactor applications and licensing activities.*  
47 *Based on these interactions, the NRC staff has received a significant number of new reactor*  
48 *COL applications (COLAs) since 2007. As of December 2010, the NRC is actively reviewing*

1 12 COLAs for a total of 20 nuclear reactor units. The NRC has suspended 6 COLA reviews due  
2 to changes in applicants' business strategies or the timing of their construction plans. One of  
3 the suspended COLAs was converted by the applicant to an ESP application. Assuming  
4 regulatory requirements are met, the NRC expects to issue two COLs by the end of 2011.

5  
6 The NRC has three DC applications and two DC amendment applications currently under  
7 review. As of December 2010, one DC application and one DC amendment are in rulemaking.  
8 The NRC has received two Advanced Boiling Water Reactor (ABWR) DC renewal requests in  
9 calendar year 2010 and expects to receive one new DC application by fiscal year 2012.

10  
11  
12 **Comment:** The following comments assert that foreign ownership of the proposed EREF and  
13 other U.S. enrichment facilities does not fulfill the need for a domestic supply of enriched  
14 uranium.

15  
16 **[015-02, Beatrice Brailsford]** The National Energy Security Policy objective AREVA's plant is  
17 supposed to meet was enunciated in a 2002 letter from the DOE to the NRC. The focus of that  
18 letter was not that the U.S. needed a foreign company to build a plant here, but rather that an  
19 American company should have a stake in U.S. enrichment capacity. Eight years later, there  
20 are no more nuclear reactors operating in the world, but as of June, URENCO, a German  
21 company, is enriching uranium in New Mexico. The NRC's efforts to ignore that plant in the  
22 Draft EIS are painful to watch.

23  
24 At any rate, let's go back to the need for domestic supplies of enriched uranium. The key word  
25 here is "domestic." AREVA is owned by the French government.

26  
27 **[015-10, Beatrice Brailsford]** At any rate, Areva is owned by the French government.

28  
29 **[031-01, James Cooper]** I am OPPOSED to the Areva project. As an Idaho taxpayer and voter  
30 I feel this state does NOT NEED a foreign company to build any facility on our soil - much less  
31 one which is subject to accidents and one whose profits go to another country.

32  
33 **[088-04, Stan Kidwell]** French-owned Areva's plant will not increase US energy security by  
34 providing a "domestic" source of enriched uranium.

35  
36 **[095-04, Linda Leeuwrik; 127-01, Sheila Plowman]** Areva's plant would not increase US  
37 energy security by providing a "domestic" source of enriched uranium. Areva is owned by the  
38 French government.

39  
40 **[110-01, John and Susan Medlin]** As the Snake River Alliance presentation pointed out, there  
41 is no current need for this facility, no compelling evidence that a nuclear renaissance is coming  
42 (or inevitable), no rationale for a French company building a nuclear facility in Idaho that  
43 purports to promote US energy security while importing inputs and exporting outputs, no  
44 provision for the deteriorating and dangerous waste that will haunt us for decades or maybe  
45 forever, no concern for yet another threat to the Snake River aquifer, the lifeblood of Idaho  
46 agriculture.

1 So how can the NRC conclude that building this facility is vital, and that the most problematic  
2 outcome to be evaluated is construction dust?

3  
4 **[115-02, Nicholas Molenaar]** Why isn't there a United States Corporation capable and willing  
5 to build this type of enrichment facility?

6  
7 **[150-07, Katie Seevers]** The company who is creating this facility is French, and its production  
8 of enriched uranium in the United States does not result in domestic control of that product as  
9 addressed in the draft EIS, section 2-17.

10  
11 **[153-03 and 153-04, Andrea Shipley; 191-10, Liz Woodruff; 197-04, Andrea Shipley, on**  
12 **behalf of the Snake River Alliance]** The EIS clearly states that Areva's product will be  
13 shipped overseas, therefore nullifying the project's effects on domestic uses of enriched  
14 uranium. Because Areva is a French company, its production of enriched uranium in the U.S.  
15 does not actually result in domestic control of that product (draft EIS, 2-17).

16  
17 **[175-06, Ellen Thomas]** Areva's plant would not increase US energy security or  
18 nonproliferation by providing a "domestic" source of enriched uranium. Areva is owned by the  
19 French government.

20  
21 **[183-06 and 183-14, James Vincent]** In conclusion, the (EIS 4-136) states the French  
22 company, AREVA's enriched product will be shipped overseas as is their profits. I do not see  
23 how this proposed project will make my country have any more domestic control over our needs  
24 for enriched fuel. The EIS specifies that the numbers of license requests for new enriched  
25 uranium, EIS 1-6, are in excess of the need for the new enriched uranium. Given the potential  
26 for accidents is considerable, I would urge the Nuclear Regulatory Commission to deny this  
27 permit at this time. I would also like to thank the Commission for hearing my testimony.

28  
29 **[187-07, John Weber]** A plan owned by a foreign company will do nothing to protect US  
30 national security.

31  
32 **[193-08, Liz Woodruff, on behalf of the Snake River Alliance]** Third, there's currently  
33 enough enriched uranium for domestic use, and AREVA is a French company and gets it  
34 uranium supply from the international market. So how does this facility give us a more reliable  
35 source of domestically-produced uranium, enriched uranium?

36  
37 **[193-13, Liz Woodruff, on behalf of the Snake River Alliance]** So the uranium, which is what  
38 we need the reliable supply of, is coming from international markets. Why does building a facility  
39 by a French government-owned company in the US increase the reliability of that supply, if it's  
40 coming internationally?

41  
42 **[192-18, Lisa Young]** Indeed, I hope that it is recognized that, while the proposal for this facility  
43 is based on the sole premise that a domestic uranium enrichment facility is needed to increase  
44 our national energy security, it will not increase our national energy security to have a foreign  
45 company enrich foreign chemicals, reap foreign profits, and sell the product to other foreign  
46 nations, as the AREVA proposal promises to do.

47  
48 **Response:** As discussed in Section 1.6 of the EIS, AES is a Delaware limited liability  
49 corporation that was formed solely to provide uranium enrichment services for commercial



1 *nuclear power plants. The investigation of any foreign relationship to determine whether it is*  
2 *inimical to the common defense and security of the United States is beyond the scope of this*  
3 *EIS and was addressed as part of the NRC's SER (NRC, 2010b).*

4  
5  
6 **Comment:** The following comments suggest that the need for domestic production of enriched  
7 uranium is not being met because the uranium feed material would be coming from a foreign  
8 source.

9  
10 **[083-02, Diane Jones]** I believe that the EIS really needs to address the obvious contradiction  
11 between the assertion that enrichment uranium is needed for the US energy independence, and  
12 the stated fact that the uranium itself may be imported and the product of enrichment may be  
13 exported.

14  
15 **[095-03 and 095-04, Linda Leeuwrik; 127-01, Sheila Plowman]** Areva's plant would not  
16 increase US energy security by providing a "domestic" source of enriched uranium. Areva is  
17 owned by the French government. The raw material for the plant would be imported and some  
18 portion of its product would be exported.

19  
20 **[153-02, Andrea Shipley; 197-02, Andrea Shipley, on behalf of the Snake River Alliance]**  
21 The purpose and the need for this facility fails to be addressed in the EIS. There is already  
22 uranium enrichment in the U.S., and the raw material comes from a foreign source. Since the  
23 uranium that will be enriched by Areva will come from foreign sources, the licensing of this  
24 facility does not create increased domestic control of reliable supplies of enriched uranium, Draft  
25 EIS, 2-6

26  
27 **[182-02, Brianna Ursenbach]** The EIS states the facility is necessary to US energy security;  
28 however, this argument is based on the unstated and unproven premise that the U.S. must have  
29 domestic sources for all of its nuclear fuel needs.

30  
31 For the sake of argument, let us accept this dubious notion, and assume all parts of the fuel  
32 cycle must be available in the U.S., to have a reliable and secure supply. From there it follows  
33 that we would need to source all of our raw uranium domestically as well.

34  
35 Yet the EIS acknowledges that the U.S. will continue to import yellow cake from foreign  
36 countries. If we cannot get all the raw material, then we cannot convert it to UF6 and domestic  
37 enrichment facilities become irrelevant.

38  
39 In many ways, this energy security argument is analogous to saying that we would be insulated  
40 from OPEC, and oil supply fluctuations, if only we were to find all or our oil in the U.S. Clearly,  
41 both of these ideas are absurd.

42  
43 Now one may argue that we simply need to resume uranium mining at home to solve this  
44 conundrum. But while it is true that U.S. does have extensive uranium reserves, the legacy of  
45 destruction and contamination left by past mining efforts make resurgence very improbable.

46  
47 Indeed, as one example, the Navaho Nation, whose land contains nearly one-quarter of all U.S.  
48 reserves, has specifically banned uranium mining. If mining is not going to be resumed in the

1 U.S. in any significant way, then additional enrichment facilities cannot ensure a reliable fuel  
2 supply, and the Eagle Rock facility is once again shown to be unnecessary.

3  
4 **[191-08, Liz Woodruff]** Since the uranium slated for enrichment will be from foreign sources,  
5 the licensing of this facility does not in fact create increased domestic control of reliable supplies  
6 of enriched uranium (draft EIS, 2-6).

7  
8 **[193-08, Liz Woodruff, on behalf of the Snake River Alliance]** Third, there's currently  
9 enough enriched uranium for domestic use, and AREVA is a French company and gets it  
10 uranium supply from the international market. So how does this facility give us a more reliable  
11 source of domestically-produced uranium, enriched uranium?

12  
13 **[193-13, Liz Woodruff, on behalf of the Snake River Alliance]** So the uranium, which is what  
14 we need the reliable supply of, is coming from international markets. Why does building a facility  
15 by a French government-owned company in the US increase the reliability of that supply, if it's  
16 coming internationally?

17  
18 **Response:** *Although the NRC staff recognizes that some of the uranium feed material for the*  
19 *proposed EREF may come from foreign sources, the specific need in the case of the proposed*  
20 *EREF is for domestic uranium enrichment capacity, as discussed in Section 1.3.2 of the EIS.*  
21 *The source of the uranium hexafluoride for enrichment is part of the need for energy security,*  
22 *but is a separate concern and, therefore, not within the scope of this EIS. However, it should be*  
23 *noted that, as discussed in Sections 2.1.3, 2.1.4.2, 4.2.9.2, D.3.1.1, and D.4 of the EIS, the*  
24 *proposed EREF would receive a portion of its feed material from a U.S. UF<sub>6</sub> production plant in*  
25 *Metropolis, Illinois; and would also receive UF<sub>6</sub> feed material from a production facility in Port*  
26 *Hope, Ontario, Canada, which obtains some of its uranium feed from a U.S. source (Cameco,*  
27 *2010).*

28  
29  
30 **Comment:** The following comments note that the enriched uranium product could be shipped  
31 outside the U.S., thereby negating any enhanced U.S. energy security. Some of these  
32 comments also suggest that the profits would also go overseas.

33  
34 **[001-02, Reham Aarti]** And I just don't think there's any need for it. There's no need for that  
35 uranium, especially when it's going somewhere else. It's not even helping us. It's not doing  
36 anything here but creating trash. We're a big giant trash can for France, and I don't think it's  
37 acceptable.

38  
39 **[014-02, William Blair]** While some jobs would be created, the processed uranium would likely  
40 be exported and much of the financial benefit would be to France.

41  
42 **[015-03, Beatrice Brailsford]** And, finally, the product, enriched uranium. The Draft EIS tells  
43 us that all AREVA's enriched uranium could, theoretically, be sold to U.S. companies, but it also  
44 tells us that potential customers are in Washington, South Carolina, North Carolina, and  
45 overseas. Is overseas a new state? But perhaps the theory will play out.

46  
47 **[015-07, Beatrice Brailsford]** So, that's the proposal to meet the need of a domestic supply of  
48 enriched uranium. A uranium factory without any national purpose will produce fuel for

1 everywhere in the world but here in Idaho, send its profits to France, and leave us with the  
2 waste.

3  
4 **[015-11, Beatrice Brailsford]** According to Areva, the natural uranium destined for its plant  
5 here belongs to American companies. But according to the Nuclear Energy Institute, as of 2007,  
6 owners and operators of US nuclear power plants bought 92 per cent of their uranium from  
7 foreign sources. And where is the natural uranium converted to uranium hexafluoride on its way  
8 to Idaho? According to the draft EIS, in Illinois, Canada, and overseas. And finally, the product,  
9 enriched uranium. The Draft EIS tells us that enriched uranium from Areva's plant could  
10 "theoretically" all be sold to US companies. But it also tells us that potential customers are fuel  
11 fabrication facilities in Washington, South Carolina, North Carolina, and overseas.

12  
13 **[040-02, Collin Day]** We don't need this facility. It's already been proven – or it's been shown  
14 that all this is going to be exported out. It's not going to help our energy independence.

15  
16 **[031-01, James Cooper]** I am OPPOSED to the Areva project. As an Idaho taxpayer and voter  
17 I feel this state does NOT NEED a foreign company to build any facility on our soil - much less  
18 one which is subject to accidents and one whose profits go to another country.

19  
20 **[032-04, Cindy Cottrell]** I'm against a foreign country making the profit from this plant and  
21 leaving the contamination in our Country.

22  
23 **[071-04, David Hensel]** I think what you need to look at a little more closely is there doesn't  
24 seem to be any guarantees that the enriched uranium that this plant is going to produce will be  
25 used in this country, meaning there's no guarantee.

26  
27 **[088-03, Stan Kidwell]** The raw material for the plant would be imported, a portion of its  
28 product would be exported.

29  
30 **[095-04, Linda Leeuwrik; 127-01, Sheila Plowman]** Some portion of its product would be  
31 exported.

32  
33 **[104-01, Carolyn McCollum]** There's little advantage to us Idahoans when Areva's nuclear  
34 fuel would be sent worldwide and its profits back to France while we are left with its radioactive  
35 waste, compounding INL's nuclear activities that have plutonium-contaminated the aquifer.

36  
37 **[120-03, Frank Nicholson]** This enrichment factory: • Is unnecessary. We were told it was for  
38 national consumption but as there is not that much demand, the finished product will be sent  
39 overseas no matter what they promise.

40  
41 **[147-08, Joey Schueler]** 4. Areva, a French company, will be the owner of this company  
42 meaning much of the revenues will go over seas. It's also unclear how many employees will be  
43 Idaho residents.

44  
45 **[153-03 Andrea Shipley; 197-03, Andrea Shipley, on behalf of the Snake River Alliance]**  
46 The EIS clearly states that AREVA's product will be shipped overseas, therefore nullifying the  
47 project's effects on domestic uses of enriched uranium.

1 [171-04, John Tanner] Now, okay, we could import enriched uranium, but then not only the  
2 profits go abroad, but the jobs, as well. I don't think that's what we want to do.

3  
4 [175-06, Ellen Thomas] Areva's plant would not increase US energy security or  
5 nonproliferation by providing a "domestic" source of enriched uranium. Areva is owned by the  
6 French government. The raw material for the plant would be imported. Some portion of its  
7 product would be exported.

8  
9 [180-10, Kaye Turner] Is it true Areva is planning to export most of their product to other  
10 countries?

11  
12 [191-10, Liz Woodruff] The EIS clearly states that Areva's product will be shipped overseas,  
13 therefore nullifying the project's effects on domestic uses of enriched uranium. Because Areva  
14 is a French company, its production of enriched uranium in the US does not actually result in  
15 domestic control of that product (draft EIS, 2-17).

16  
17 [193-07, Liz Woodruff, on behalf of the Snake River Alliance] Secondly, the draft EIS clearly  
18 states that AREVA's product will be shipped overseas, nullifying the project's effects on  
19 domestic uses of enriched uranium....

20 And finally, quote: "Potential customers are fuel fabrication facilities in Richmond, Washington,  
21 Columbia, South Carolina, Williams, North Carolina, and overseas, through ports in Virginia and  
22 Maryland." So this domestic reliable supply of enriched uranium that we need in this country will  
23 be shipped overseas by AREVA. The need argument is highly problematic and doesn't stand.

24  
25 [192-18, Lisa Young] Indeed, I hope that it is recognized that, while the proposal for this facility  
26 is based on the sole premise that a domestic uranium enrichment facility is needed to increase  
27 our national energy security, it will not increase our national energy security to have a foreign  
28 company enrich foreign chemicals, reap foreign profits, and sell the product to other foreign  
29 nations, as the AREVA proposal promises to do.

30  
31 **Response:** *As discussed in Section 1.3.2 of the EIS, one purpose of the proposed EREF is to*  
32 *promote U.S. energy security by providing an additional domestic source of enriched uranium*  
33 *production capacity. The export of any enriched uranium from the proposed EREF in excess of*  
34 *that required by domestic U.S. customers is not inconsistent with that purpose, as long as this*  
35 *export complies with applicable laws and regulations. The destination of the enriched uranium*  
36 *from the proposed EREF is specified by the utility customer who is also responsible for*  
37 *specifying the supplier of the uranium to be enriched. The NRC licenses the import and export*  
38 *of radioactive materials under 10 CFR Part 110.*

39  
40 *As discussed in Section 1.6 of the EIS, AES is a Delaware limited liability corporation that was*  
41 *formed solely to provide uranium enrichment services for commercial nuclear power plants.*  
42 *AES's principal business location is in Bethesda, Maryland, while operations would occur at the*  
43 *proposed EREF in Bonneville County, Idaho. These locations, both within the United States,*  
44 *would benefit from the investments made to construct and operate the proposed EREF.*  
45 *Determination of the destination of any additional profits is not within the scope of this EIS.*

1 **I.5.5 Scope of the EIS Analysis**  
2

3 **Comment:** The following comment discusses national versus local issues pertaining to the  
4 construction of the proposed EREF.  
5

6 **[035-01, Stephen Crowley]** I guess my concern is a certain kind of inconsistency in how you're  
7 evaluating the cost and benefits. And it might just be a misunderstanding. But it seems to me  
8 that the primary positive reason for constructing an enrichment facility is one having to do with  
9 provision of safe energy resources for the nation. If that's correct, then what you've given me is  
10 an argument for building an enrichment plant somewhere. Okay. Now I'm not -- I don't want to  
11 bore into the issue of whether or not that's correct. But what I'm going to say is what you're  
12 talking about is whether or not we should have a plant at all.  
13

14 That's what I got. They call that dancing, where I'm from. Right. So the-- yes. So putting aside  
15 any issues about the correctness or incorrectness of this judgment -- right -- this is an argument  
16 for building a plant somewhere. Right.  
17

18 Now what we haven't heard -- so what that makes me worry about, then is the process that the  
19 EIS went through in ruling out a certain kind of alternative sources for this product; right?  
20 Because, really, in conducting that process, what you thought about was whether or not to build  
21 the Eagle Rock facility. Right? So it's a question of should the Eagle Rock facility be built or not,  
22 and then you looked at alternative locations and ruled those out.  
23

24 But that's not the same question; right. That's a question about a particular facility at a particular  
25 place, and we've been -- we've identified positives and negatives of building that particular  
26 facility; right. And whatever you think of those, those would be equally true if you built that  
27 facility anywhere at all; right. There would be waste concerns. There would be economic  
28 benefits.  
29

30 So there's a certain kind of mismatch between the primary motivation for the existence of this  
31 facility, right, which is a national motivation, and the terms of the debate, which is a particular  
32 debate about an individual facility; right. So whether I agree with the proponents, or whether I  
33 agree with the people who aren't impressed, I'm like -- I'm saying that seems to be inconsistent  
34 with your primary motivation. That seems to me, that given that this is an EIS for a particular  
35 facility, that general -- or that national level motivation has to come off the table; right. It should  
36 be the issues about the particular facility under consideration, and if what you're doing is  
37 identifying features of this facility that could equally well be provided by any other facility, then  
38 those are not relevant to identifying whether or not to build this facility.  
39

40 **Response:** *As pointed out in the comment, the need for the proposed EREF is national in*  
41 *scope. The process used to select the location of the proposed EREF is discussed in*  
42 *Section 2.3.1 of the EIS. Potential impacts of construction, operation, and decommissioning of*  
43 *the proposed EREF at the chosen site are analyzed to comply with NEPA. All impacts,*  
44 *regardless of whether they are similar to those if the facility were built elsewhere, must be*  
45 *considered in the EIS.*  
46  
47



1 **Comment:** The following comment requests that certain conditions be included in AES's  
2 license.

3  
4 **[066-01, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** In  
5 addition to comments on the EIS, if the AREVA facility is granted a license by the NRC we  
6 requested the following conditions be included in the license.

7  
8 1. The state requests the NRC require AES to submit a yearly report to the Director of the  
9 Idaho DEQ on or before January 15th of each year that identifies the number of cylinders of  
10 DUF6 stored on site and the date of the longest stored container.

11  
12 2. The state requests the NRC require AES to provide the state the same access to documents  
13 and materials relating to the AES radiation protection program that is required to be provided to  
14 the NRC.

15  
16 3. The state requests the NRC require AES to allow Idaho DEQ to accompany NRC staff on  
17 any of its inspections of the AES facility. In this regard, the state requests the NRC require AES  
18 to allow Idaho DEQ staff the same access to its facilities, documents, materials and personnel  
19 to which NRC is entitled. Idaho DEQ shall execute any confidentiality agreement necessary to  
20 participate in such inspections and shall comply with all appropriate AES plant rules (e.g.,  
21 safety, security) and any applicable NRC requirements when participating in such inspections.

22  
23 4. The state requests the NRC require AES to provide the Idaho DEQ the physical security plan  
24 for the AES facility.

25  
26 5. The state requests that NRC require AES to provide periodic training to local emergency  
27 responders for both transportation and plant operation incidents, and that the Idaho DEQ be  
28 sent a copy of the training plan and notified when such training occurs.

29  
30 6. It is common for facilities of this nature to fund monitoring programs run by a separate party,  
31 in addition to their own program. The state requests that NRC require AES to fund an  
32 independent third party Environmental Monitoring program for the Eagle Rock Facility.

33  
34 **Response:** *As stated by the Idaho Department of Environmental Quality (IDEQ) in the above*  
35 *comment, its request for including the license conditions is "in addition to comments on the EIS."*  
36 *AES's license and the conditions in that license are not included in the scope of the EIS*  
37 *analysis, and are separate issues that are determined by the Commission following the*  
38 *issuance of the SER and Final EIS and the conclusion of the mandatory hearings. In the*  
39 *meantime, the NRC plans to work with IDEQ and AES regarding IDEQ's requested license*  
40 *conditions.*

41  
42  
43 **Comment:** The following comment relates to spent fuel rod reprocessing and high-level waste  
44 generation and handling.

45  
46 **[091-01, Arthur Kull]** I have followed the debate and arguments from both sides of the  
47 spectrum and came to the conclusion that the NRC should grant AREVA the permit to build and

1 operate the uranium enrichment facility planned for the Idaho Falls area. It is an important step  
2 for us in the US that spent fuel rods be reprocessed to

- 3
- 4 • Increase the utilization factor of the material that is now stored at the many power plants.
- 5
- 6 • Reduce the amount of high level waste generated that needs a permanent storage facility like
- 7 Yucca Mountain.
- 8

9 **Response:** *The construction, operation, and decommissioning of the proposed EREF does not*  
10 *involve the reprocessing of spent fuel rods or the generation or handling of high-level waste.*  
11 *Therefore, the subject of the above comment is not within the scope of the EIS.*

12

13

14 **Comment:** The following comments question the pursuit of technology that appears to have a  
15 limited lifetime.

16

17 **[183-04, James Vincent]** My other issue is about estimates of uranium throughout the world.  
18 The research I have done shows that there's somewhere between 50 years at the low end, and  
19 100 years on the optimistic side. Why would we utilize a technology that costs literally billions of  
20 dollars to implement, with public tax dollars for a loan guarantee, and I realize that it is a  
21 guarantee, and Idaho tax incentives for a limited time technology? Even 100 years is not very  
22 long, as far as reserves.

23

24 **[183-11, James Vincent]** My research has found known estimates world wide of uranium  
25 somewhere between 50 years on the low end and 100 years on the optimistic side. Why would  
26 we utilize a technology that costs literally billions of dollars to implement with public tax dollars  
27 for a loan guarantee and Idaho tax incentives for a limited time technology, Even 100 years is  
28 not very long as far as reserves.

29

30 **Response:** *The pursuit of the gas centrifuge technology for uranium enrichment, which has a*  
31 *limited lifetime, is a national energy policy issue that is not within the scope of this EIS (which is*  
32 *for the proposed EREF). As discussed in Section 1.3 of the EIS, the proposed action is*  
33 *intended to satisfy the need for an additional reliable and economical domestic source of*  
34 *uranium enrichment services. The above comments are directed at the choice of nuclear power*  
35 *as an energy source. These comments are not within the scope of the EIS.*

36

37

38 **Comment:** The following comments raise various U.S. government issues that are not directly  
39 related to the scope of the EIS.

40

41 **[110-02, John and Susan Medlin]** In the US today, government oversight of corporate  
42 behavior is laughable, regardless of the riskiness of corporate operations. And the quaint  
43 concept of "corporate social responsibility" has been completely replaced with single-minded  
44 pursuit of profitability regardless of consequences to human, economic, and environmental  
45 health. Ergo, corporations operate with neither external nor internal restraint, however vile the  
46 consequences might turn out to be.

1 Now in Idaho we have the perfect combination: tough times, high joblessness, hungry  
2 contractors, no government oversight at any level, and corporate greed. This is the recipe for  
3 ruination of our environment, and subsequently our health and long term economic development  
4 potential.

5  
6 Add our unequivocal “NO” to the responses you have received regarding approval of this  
7 proposal.

8  
9 **[180-12, Kaye Turner]** And finally, I wonder if Iran was proposing a plant like this would the  
10 United States have an objection to it?

11  
12 **Response:** *U.S. government policies, including national energy policy issues, are not within the*  
13 *scope of this EIS, which is for the proposed EREF. The proposed action is intended to satisfy*  
14 *the need for an additional reliable and economical domestic source of uranium enrichment*  
15 *services. The issues raised in the above comments are national policy issues that are outside*  
16 *the scope of this EIS.*

17  
18  
19 **Comment:** The following comments relate to parts of the nuclear fuel cycle other than uranium  
20 enrichment.

21  
22 **[131-08, Morty Prisament]** Source and Implications of Uranium Proposed to be Used: The  
23 source of uranium to be used and environmental implications related to extraction and transport  
24 needs to be evaluated, including environmental justice and socioeconomic considerations.  
25 National security considerations related to using proposed sources versus alternative sources  
26 should also be discussed.

27  
28 **[191-06, Liz Woodruff]** Radioactive material is inherently dangerous. Just the activities directly  
29 connected with uranium enrichment pose risks, as do all other parts of the fuel chain. The NRC  
30 should perform a complete analysis of the risks of uranium mining and milling, mixing yellow  
31 cake with hexafluoride (itself a dangerous material), enriching UF6 in gas centrifuge plants,  
32 storing and deconverting depleted UF6, disposing of depleted uranium and low level waste,  
33 fabricating fuel from enriched uranium, and all intermediate transportation steps.

34  
35 **[193-02, Liz Woodruff, on behalf of the Snake River Alliance]** But when we talk about the  
36 waste, it's really important that everybody here understand what is being proposed. The  
37 proposal is for a uranium enrichment factory, but that's only one part of the nuclear fuel chain.  
38 The entire nuclear fuel chain is dirty, dangerous, and promotes the transportation of radioactive  
39 materials on interstates, railways, and highways, which presents an enormous risk.

40  
41 First, uranium is mined, which produces a waste stream, then it's transported, and it's milled  
42 and refined, which produces a waste stream. Then it's transported and it's converted, which  
43 produces a waste stream. And then it is transported to a uranium enrichment factory. That is  
44 what is being proposed in Idaho. It's very important that we understand that this is in the middle  
45 of the fuel chain. This not a nuclear power reactor. This is not a reprocessing facility. It's an  
46 enrichment factory.

1 **Response:** *The proposed action is intended to satisfy the need for an additional reliable and*  
2 *economical domestic source of uranium enrichment services. The comments are directed at*  
3 *evaluating impacts related to the origin of the uranium to be enriched and impacts of other parts*  
4 *of the nuclear fuel cycle, which are not part of the proposed action. Therefore, these comments*  
5 *are not within the scope of the EIS.*  
6  
7

8 **Comment:** The following comments suggest that other energy options be pursued.  
9

10 **[008-03, Carol Bachelder]** But the decommission process and the construction process, and  
11 the transportation, and on and on and on -- how can we possibly expect any sort of economic  
12 feasibility for the price of this energy that we're paying for with all these extensive expenses? It  
13 boggles the mind. I don't see how we could possibly get, you know, the amount out of -- the  
14 amount of energy out of this thing that we're going to put into it, you know, in the terms of  
15 money. Energy is really kind of behind the whole argument here, and I'm interested in  
16 alternative forms of energy, so I would have to support the not action alternative for the nuclear  
17 plant. But solar has great potential because of economic warming. A month ago, the entire  
18 United states, on the weather map, was red. If we could only figure out storage for this energy  
19 from the sun, we could get through the whole winter. My neighbor has a big solar panel, and  
20 she put drapes over it because, I mean, you don't want to warm your house in the summer time,  
21 do you? But if you could store the energy from the heat of the sun during this summer, you  
22 could get through the winter, and I don't think that the cost could possibly compare to the  
23 amount of money that you're proposing to spend on this thing.  
24

25 **[025-03, Hon. Sue Chew]** You know, when we look at our energy needs, you know, I really am  
26 the "big picture" person. And not only should we look at nuclear as a source of energy, but, you  
27 know, we've got a lot of other things that we really should be looking at in the state and in this  
28 nation.  
29

30 And I would like as much effort being put forth, and as much support, being put forth with our  
31 other sources of energy. When we look at solar, we look at geo, when we look at wind, I'd like to  
32 see that develop, especially in this state. And, you know, we've heard that the energy that would  
33 be developed through this particular mechanism doesn't benefit our state. I'd like for us to reflect  
34 on that.  
35

36 And I'd like for, you know, the ingenuity of Idahoans here, our researchers are regular people  
37 that have good ideas, really, to be supported in our state with regard to these other sources.  
38 Conservation goes a long way, and I think that all these things need to be at the table, not just  
39 nuclear, and, you know, I really have a caveat with regard to this, because of potential dangers.  
40

41 **[032-06, Cindy Cottrell]** The jobs that this plant will produce will be few in comparison to the  
42 cost of allowing it here. Maybe 300 people will get jobs that will not last forever, but only for the  
43 lifetime of the plant. Right now it will cost tax payers would have to loan Areva \$2 billion. Other  
44 types of energy would be much more worth the taxpayer's money. That's a lot of money for  
45 300 jobs and waste to manage forever. Other kinds of energy that is less risky would be better  
46 to invest in.  
47

1 **[040-03, Collin Day]** We need to look at things like – I’ve been reading about the “smart grid.” I  
2 think we have got plenty of energy in this country. We just need to use it smarter, or we need to  
3 be smarter about how we use it.  
4

5 **[044-01, Dennis Donnelly]** I would point out that this section of considering alternatives  
6 assumes that it has to supply enriched uranium for national energy security; that is, they  
7 assume that this plant is going to be built, and it neglects the alternative of not building these  
8 plants.  
9

10 I would point out that if you build this facility, it commits America, this is the unstated thing, it  
11 commits America essentially to a future that includes nuclear power, and all the nightmares  
12 associated with it. I would like to point out that there are other options that some of the  
13 nightmares would be a police state in our communities, where the Soviet Russians and the  
14 Germans that we already have that police state. These things are so dangerous that we’re  
15 considering bombing Iran and the Israelis are considering bombing Iran for exactly the same  
16 facility. It’s so dangerous. The reason is, of course, that you build this facility, and then you build  
17 the reactors, the reactors breed plutonium, plutonium can make weapons. You can’t take that  
18 away once you’ve done it.  
19

20 The police state is a terrible thing. The rest of it has to do with the threat of military attack on  
21 these facilities, on the plants. Nobody seems to address that all these atomic power plants are  
22 built above ground. Any kind of terrorist or military attack on any one of them can take out two  
23 states, that much area. We’ve seen Chernobyl. We know it can happen, and it has happened.  
24 Even accidents can take out a large area. Right now we have major problems still from  
25 Chernobyl, and everyone knows it.  
26

27 I would like to point out there are alternatives that have not been considered, that I’d like to  
28 mention. A couple of weeks ago, there was an announcement in the “New York Times”, and I  
29 followed it up, and yes, it’s true, there was a study in North Carolina that concluded for the first  
30 time that new power plants in North Carolina were cheaper to build with solar power than with  
31 nuclear power. This is a major crossover point that should be considered. And you see there are  
32 none of the problems, there are no activation products, there are no fission products, there are  
33 no actinides, there is no plumbing of unmanageable wastes that we’re casting into the future for  
34 all of geologic time that require management and armies to manage them. None of the  
35 problems if you go with solar power, and with -- instead of nuclear power. And I would urge  
36 everyone to consider personally their own career options right now.  
37

38 If we go ahead with this plant, we’re committing to a future that dumps unmanageable problems,  
39 and a police state on the future of this country, and every country. Whereas, if we do the  
40 unspoken thing, let all our aging and outdated nuclear plants expire, and then use clean energy,  
41 non-carbon energy for the future, and not this totally toxic nuclear energy.  
42

43 **[050-06, Joanie Fauci]** The money being spent on these EIS documents, the hearings, the pre-  
44 building, and the rest should instead be spent on research and production of alternative energy  
45 sources. Alternative energy research and production also brings jobs.  
46

47 **[071-01, David Hensel]** I’m not a proponent of nuclear power, and I may be a wacko, but the  
48 reason I’m not a proponent of nuclear power, one of the reasons is don’t think it’s a very  
49 cost-effective or a very good energy source as far as being competitive on the energy market.  
50



1 **[083-03, Diane Jones]** As far as need, I know some speakers have attempted to make a case  
2 for need in terms of jobs and tax base, and any project can be justified in terms of jobs and tax  
3 base, including cleaning toxic waste. That's no really what we want in Idaho. There are plenty of  
4 alternatives. I know that's not covered by the EIS, but in the "big picture," jobs could be created  
5 with energy systems that might be based on wind and solar, that would have less adverse  
6 environmental effects.

7  
8 **[095-10, Linda Leeuwrik]** In both Idaho and the entire United States, we need to focus our  
9 resources on developing clean and renewable sources of energy, rather than investing more  
10 money into "dirty" sources and technologies that will leave us with waste that we have no good  
11 solutions for dealing with. Thus, I cannot state adamantly enough, how opposed I am to Areva's  
12 proposed enrichment facility in South East Idaho.

13  
14 **[113-02, Ken Miller]** There's been talk about nuclear as a baseload power source, and as a  
15 clean alternative to coal, and also gas to a degree, I suppose. It is true that nuclear power has a  
16 capacity factor, as we heard earlier tonight, that does qualify it as baseload, but it's not the only  
17 resource that can fill that bill. The U.S. Department of Energy does not put all of the nation's  
18 future energy eggs in the nuclear basket. Far from it, it envisions a much more diverse energy  
19 portfolio that is more reliant than ever on energy efficiency, and conservation, and other truly  
20 renewable baseload energy resources.

21  
22 In Idaho, we have other baseload energy resources, such as hydropower and geothermal, and  
23 our utilities are working hand and glove with DOE at the INL, and at the National Renewable  
24 Energy Laboratory, to more efficiently integrate wind and solar into our increasingly smart grid.  
25 Our region's six power plan, which was adopted by the Northwest Power and Conservation  
26 Council, projects that our region can meet 85 percent of our new load growth over the next 20  
27 years through energy efficiency, and to a degree, renewable energy. The plan does not envision  
28 the development of any large-scale regeneration for the next 20 years, and that would include  
29 nuclear.

30  
31 **[103-06, Karen McCall]** Areva wants US Federal loan guarantees in the amount of \$2 billion  
32 dollars. US taxpayers would get far more energy for that money spent on renewables. An  
33 analysis by Idaho Power shows that nuclear power would cost significantly more per megawatt  
34 hour than wind, geothermal and biomass.

35  
36 **[106-04, Ted McConaughy]** I also think that the – maybe the most interesting issue in favor  
37 of this project is the idea that we need a stable baseload, and a carbon-free stable baseload.  
38 And I feel like this – that there are alternatives for the baseload. I mean, certainly, hydro is one,  
39 and we have other ways of storing energy.

40  
41 For example, for instance, any of these – any electricity generator can produce hydrogen, and  
42 we could store hydrogen, and I don't know the economics of these various things, but what I do  
43 know is there are many possible ways of storing energy with efficient retrieval possible.

44  
45 And so to think that we require immediate access to baseload power, at all times, I think ignores  
46 the possibility that we have other storage options that might be – that might work in conjunction  
47 with ephemeral power sources like wind and solar, in order to give us the essential benefits of  
48 baseload power.

1 **[120-02, Frank Nicholson]** Thorium is a viable alternative making this type of enrichment  
2 obsolete.

3  
4 **[120-05, Frank Nicholson]** There are less dangerous methods of nuclear power being  
5 developed. i.e., thorium. Wait until these methods are practical and then relook at a modified  
6 proposal.

7  
8 **[132-01, Margo and Dennis Proksa]** However, there are many who know the truth about  
9 nuclear power - from mining to uranium enrichment and all the steps between - it's dirty,  
10 dangerous, and expensive, And we think there's no need for a renaissance at all because there  
11 are wiser alternatives to renewable sources.

12  
13 We propose the following energy efficient strategies to be paid for with the \$2 billion loan from  
14 the feds, and whatever Idaho is throwing in. Buy and install energy efficient appliances for every  
15 Idahoan who needs them: hot water heaters, refrigerators, washers, and dryers, insulate Idaho  
16 homes and commercial buildings that are inadequately protected, more cash for clunkers,  
17 expand renewable energy resource development, wind, solar, geothermal, and the grid, build  
18 bike paths throughout Idaho communities for everyone to use for commuting to work, and to  
19 schools, and for recreation, encourage bike travel by making it safe and enjoyable, get young  
20 people involved in energy issues and problem solving by developing an education program that  
21 encourages imagination, ingenuity, and self-sufficiency that are carbon-free and nuclear-free.  
22 Why not?

23  
24 This would be an economic stimulus package that would diversify the population that needs  
25 help the most, the unemployed and the middle class. This could have a positive and profound  
26 effect locally and globally. It would create jobs for Americans, the appliance manufacturers who  
27 buy raw materials like steel, and delivery and installation jobs, and jobs to extract recyclable  
28 materials from old appliances. Jobs where they make insulation, and jobs to install the  
29 insulation, jobs in manufacturing fuel efficient cars, trucks, and buses, jobs in city planning to  
30 route bike paths throughout their communities, and jobs for road and path construction, as well  
31 as the materials for that expansion, jobs in bike manufacturing, jobs in renewable energy  
32 technologies.

33  
34 There are abundant health benefits and energy savings with this plan. A healthier population,  
35 because of the option to pedal around town, a broader cross section of Americans who will find  
36 work in their communities, and the cost of energy at home and fuel for their vehicles will be  
37 reined in, stress levels will drop improving everyone's attitude and outlook. Other states and  
38 countries would admire Idaho for its truly progressive focus on the short and long-term goals.  
39 Idaho could become a model for sustainable living. Tourism would increase just because people  
40 would want to see progress to believe it, especially in such a scenic state.

41  
42 In addition to these straightforward suggestions for energy savings, job creation, health benefits,  
43 and collective attitude adjustment, there are a wealth of other positive side effects for Idaho if  
44 AREVA does not build a uranium enriching plant here.

45  
46 We would not have to loan a foreign company/country billions of dollars we can put to better use  
47 ourselves. And we don't have to give them any more money if they underestimate costs, or  
48 have technical problems they don't expect during construction, or pay for cleanup after they take  
49 their profits and return to France. Idaho would not be responsible for the safety and cost of

1 storing tons of depleted uranium waiting patiently until the day comes when someone figures  
2 out what to do with it, and where to put it. Idahoans would not have to share the roads with  
3 thousands of loads of toxic and dangerous materials. Idahoans won't have to worry about living  
4 downwind of smoke or emissions should there be a fire, or terrorist attack at the facility. We  
5 don't have to endanger any wildlife because of habitat destruction, or lose productive farmland.  
6 We can rest assured radioactive materials will not be lost in the system and used for making  
7 bombs, since enrichment is a proliferable technology. The Snake River Aquifer would be  
8 protected from further contamination.

9  
10 The advantages of not financing AREVA are huge. U.S. energy policy must shift its attention  
11 and resources to the development of carbon-free and nuclear-free alternatives that are faster,  
12 cheaper, and less risky. We can think outside the dirty, dangerous, and expensive nuclear  
13 power box.

14  
15 **[147-19, Joey Schueler]** 15. Many things can be done to align our energy needs with the other  
16 options available to power our grids in America and with far less reliance on foreign trade:

17  
18 a. Renewable energy sources are available and new technologies can be developed  
19 through U.S. ingenuity, providing a global demand for American jobs and products.

20  
21 b. The American grid is old and outdated. The restructuring of our grid will effectively  
22 limit waste, save the environment and provide an economic growth engine based on  
23 America's "needs" not it's consumerist wants.

24  
25 c. Perhaps we should limit our energy use... I know most Americans don't want to hear  
26 that, but if it's that or sunbathing next to a depleted Uranium cesspool, which would you  
27 choose?

28  
29 **[168-09, Lon Stewart]** The United States could invest the DOE \$2 billion loan in American  
30 companies that would apply towards carbon free renewable energy such as geothermal, wind  
31 and solar power systems along with energy efficiency and conservation programs that would be  
32 on line sooner than any nuclear facility. The money would be distributed over many multiple  
33 companies rather than one facility. Even if a portion of the loan(s) defaulted, at least the money  
34 was spent in the United States, on our projects, employing our people, and we saved some  
35 energy in the process. The stone age did not end because we ran out of stone. The nuclear age  
36 should not end because we used up all the uranium. The US can become energy independent if  
37 we utilize our renewable energy sources and concentrate on conservation and efficiency  
38 measures. This sounds much better to me.

39  
40 **[175-03, Ellen Thomas]** There is no need for a new US plant to enrich uranium for electricity  
41 production. Current supplies are clearly adequate, and as we develop healthy solar, wind, tidal  
42 and other truly clean energy systems, there is no need for new nuclear power plants.

43  
44 **[181-10, Roger Turner]** The following conditions, in combination, eliminate the need for this  
45 project: (a) recent finds of large amounts of natural gas in the U.S. is reducing interest in nuclear  
46 power and rendering nuclear power uneconomical in comparison. (b) the cost of solar and wind  
47 power are coming down resulting in a larger role for these power sources and; (c) with the  
48 reduction of nuclear power plants in the U.S. domestic uranium enrichment plants will be able to

1 supply the nuclear power industry with ample supplies of U-235, without the need for this  
2 proposed, expensive, AREVA plant. The aforementioned points are detailed below:

3  
4 (A) Recent finds of large amounts of natural gas fields in the U.S. reducing the interest and  
5 momentum by power companies in developing nuclear power. New finds of domestic natural  
6 gas has resulted in a switch in interest from coal and nuclear to gas for power supplies. A recent  
7 MIT study, that is more up-to-date than the study referenced in the draft EIS, reveals a likely  
8 economically realistic switch to natural gas for the United States power supplies. This study, by  
9 a group of 30 MIT faculty members, researchers and graduate students reflects the more  
10 accurate conditions for power plant construction in the United States for the next 40 years. The  
11 study shows a baseline global estimate of recoverable gas resources reaching some 16,200  
12 trillion cubic feet (Tcf), enough to last over 160 years at current global consumption rates. (The  
13 Future of Natural Gas -- Study finds significant potential to displace coal, reducing greenhouse  
14 gas emissions, MIT, June 2010) In addition the study reports the following trend:

15  
16 “Natural-gas consumption will increase dramatically and will largely displace coal in the power  
17 generation sector by 2050 (the time horizon of the study) under a modeling scenario where,  
18 through carbon emissions pricing, industrialized nations reduce CO<sub>2</sub> emissions by 50 percent by  
19 2050, and large emerging economies, e.g. China, India and Brazil reduce CO<sub>2</sub> emissions by  
20 50 percent by 2070. This assumes incremental reductions in the current price structures of the  
21 alternatives, including renewables, nuclear and carbon capture and sequestration.”

22  
23 According to U.S. Energy Information Administration Annual Energy Outlook 2010, domestic  
24 and Canadian gas supply will increase, at least to 2035.

25  
26 Shale gas provides largest source of growth in U.S. natural gas supply

27  
28 The increase in U.S. natural gas production from 2008 to 2035 in the AEO-2010 Reference  
29 case results primarily from continued growth in production of shale gas, recent discoveries in  
30 deep waters offshore, and, to a lesser extent, stranded natural gas brought to market after  
31 construction of the Alaska natural gas pipeline is completed in 2023. Shale gas and coalbed  
32 methane make up 34 percent of total U.S. production in 2035, doubling their 17-percent share in  
33 2008. Shale gas is the largest contributor to the growth in production, while production from  
34 coalbed methane deposits remains relatively stable from 2008 to 2035.

35  
36 (B) The cost of solar power is lower than nuclear power, resulting in a larger role for these  
37 power sources. The New York Times reports the following article:

38  
39 Solar power costs have been declining, the costs of nuclear power have been rising inexorably  
40 over the past eight years, said Mark Cooper, senior fellow for economic analysis at Vermont  
41 Law School’s Institute for Energy and Environment. Estimates of construction costs — about  
42 \$3 billion per reactor in 2002 — have been regularly revised upward to an average of about  
43 \$10 billion per reactor, and the estimates are likely to keep rising, said Mr. Cooper, an analyst  
44 specializing in tracking nuclear power costs. (New York Times; Special Report: Energy and  
45 Environment, Nuclear Energy Loses Cost Advantage, July 26, 2010)

46  
47 (C) Switch to other power sources means no need for Areva. Given the above two examples of  
48 a switch to other power sources than nuclear, the existing plans for enrichment will be adequate  
49 to supply the U.S. nuclear industry. The Les Urenco company has plans to produce up to

1 6 million SWU; while the USEC produces 10.5 Million SWUs. Also, in 2008, an amended  
2 agreement allows Russia to export increasing amounts LEU available to nuclear power  
3 companies to the United States, starting with 442,000 pounds in 2011 and up to 13.7 Million  
4 pounds in 2020.

5  
6 While it is true that some nuclear plants may expand their existing power plant, such as Watts  
7 Bar 2 (TVA), there will be nowhere near the number of new units predicted by the NRC's Energy  
8 Assessment Administration Report (EIA 2009a) and nowhere near the need for SWUs  
9 referenced in the draft EIS for AREVA; and because of many nuclear plants are  
10 decommissioning -- there will be less and less need for enriched uranium. Many of the firms that  
11 initially consider nuclear construction are bound by State requirements that they be 'prudent  
12 investors'. Therefore, many initial applicants to NRC are dropping out completely, or keeping  
13 them on hold.

14  
15 Consequently, the EIS should carefully review current studies and assessments that show a  
16 general swing to natural gas, solar and wind. Unfortunately the NRC fails to take a hard look at  
17 this purported need. A nuclear power plant hasn't been built in the United States in two  
18 decades. The EIS needs to provide economic comparisons of nuclear vs. Solar and Natural  
19 Gas. More and more companies are dropping their nuclear power applications to NRC, and  
20 therefore the need for this plant is not justified, given the existing and soon to open facilities in  
21 the U.S. to provide sources of enriched uranium.

22  
23 **[193-12, Liz Woodruff, on behalf of the Snake River Alliance]** This is from a study by  
24 Mark Cooper of Vermont Law School in June of 2009, and he argues that the cost projections  
25 for new reactors are four times as high as the initial nuclear renaissance projections. So there's  
26 an economic obstacle, significant economic obstacle that has to be overcome for this supposed  
27 renaissance to occur.

28  
29 He argues that nuclear reactors are, in fact, the worst option from the point of view of the  
30 consumer in society.

31  
32 He talks about the ways in which efficiency, cogeneration, biomass, geothermal, other  
33 renewables, are less costly and more viable forms of energy production, leaving us with six  
34 cents per kilowatt hour versus 12 to 20 cents per kilowatt hour, to pursue the nuclear option.

35  
36 And I would argue, in fact, that this third point should have been an alternative pursued in the  
37 EIS. You heard them say that they looked at the "no alternative," or the "no action alternative."  
38 Why didn't they look at the efficiency and renewable energy alternative?

39  
40 And finally, the additional cost of building a hundred new nuclear reactors could be 1.9 to  
41 4.4 trillion dollars. Now I know that "billion" has lost its shock value lately, but we should kind of  
42 be shocked by the trillion number, and this economic obstacle is certainly one that calls into  
43 question the hypothesis posed by the NRC, that there'll be a need for new enriched uranium.

44  
45 And just to underscore this, this is a chart that was just released in a Duke University study in  
46 July of this year, and it shows, with the yellow line, the cost of nuclear going up and the cost of  
47 solar coming down.



1 So this economic obstacle presented by the nuclear -- you know, before the nuclear industry, is  
2 one that renewables are not facing. As a matter of fact, the costs are coming down.

3  
4 And again, this obstacle is one that we believe will stop the supposed nuclear renaissance, and  
5 actually lead to a nuclear collapse, therefore nullifying the claim that's the premise of the NRC,  
6 that there's a need for new enriched uranium.

7  
8 **Response:** *The issues raised in the above comments are national energy policy issues that are*  
9 *not within the scope of this EIS, which is for the proposed EREF. The proposed action is*  
10 *intended to satisfy the need for an additional reliable and economical domestic source of*  
11 *uranium enrichment services. The alternatives in the comments raise national policy issues*  
12 *(e.g., finding other sources of energy) that would not satisfy the need of the proposed action,*  
13 *and therefore such alternatives are not within the scope of the EIS.*

14  
15  
16 **Comment:** The following comments raise objections to the preconstruction exemption granted  
17 to AES by the NRC and suggest that the impacts of preconstruction were not evaluated in the  
18 Draft EIS.

19  
20 **[015-18, Beatrice Brailsford]** Because of an exemption granted in March 2010, Areva will be  
21 allowed to start "preconstruction" activities as early as October 2010. This preconstruction  
22 exemption shows a bias towards licensing. It appears the NRC has already made the decision  
23 to allow the project to move forward even before the necessary impact assessments and public  
24 comment periods have been completed. Preconstruction constitutes one part of a major federal  
25 action. 40 CFR 1500.1(b) requires that information be available before an agency makes  
26 decisions or takes any action. It is impossible for the NRC to produce a final EIS and ROD  
27 before preconstruction starts in October. The NRC must either revise the current draft to include  
28 the impacts of preconstruction or must write an additional EIS that specifically addresses  
29 preconstruction activities. The NRC must not allow preconstruction to commence until after a  
30 ROD is issued.

31  
32 **[015-20, Beatrice Brailsford]** The transmission lines compound the negative impact the will  
33 accrue to pronghorn antelope, greater sage grouse, and ferruginous hawks, which will all likely  
34 abandon the Areva site and surrounding areas. Sage grouse is a candidate species for federal  
35 protection. The Idaho Department of Fish and Game reaffirmed the threats transmission lines  
36 would pose to wildlife, challenged the methodology of sage grouse and lek analysis in the draft  
37 EIS, recommended burying transmission lines, and suggested Areva submit to plans to mitigate  
38 for the expected wildlife impacts. These concerns do not appear to have been addressed in this  
39 EIS and must be addressed before any preconstruction activities are allowed or before this EIS  
40 review continues.

41  
42 **[018-02, Deb Brown; 035-01, Stephen Crowley; 055-02, Claudia Galaviz; 056-01, Mark**  
43 **Galaviz; 063-02, Martha Haga; 101-02, Jody May-Chang; 117-02, Richard Morgan; 188-02,**  
44 **Lana Weber-Wells]** In particular, I am concerned that the NRC will allow Areva to start "pre-  
45 construction" activities in October of 2010 — which would be before the Record of Decision on  
46 this license is released. Moreover, preconstruction constitutes one part of a major federal action  
47 and 40 CFR 1500.1(b) requires that information be available before an agency makes decisions  
48 or takes any action. The impacts of preconstruction must be evaluated in the draft EIS, or  
49 another EIS should be initiated to assess preconstruction impacts.

1 **[025-05, Hon. Sue Chew]** Trained as clinical pharmacist, I am taught to make sure of the facts  
2 and additionally to cut corners ultimately costs lives or causes morbidity. I am thus particularly  
3 concerned that the NRC start of the “preconstruction” activities in October of 2010 - which would  
4 be before the Record of Decision is released.  
5

6 In addition, preconstruction comprises one part of a major federal action in which 40 CFR  
7 1500.1(b) requires that information be available before an agency makes decisions or takes any  
8 action. The impacts of preconstruction must be evaluated in the draft EIS before preconstruction  
9 begins. Alternatively, I would strongly recommend that an additional EIS should be initiated to  
10 assess preconstruction impacts.  
11

12 **[027-02, Sara Cohn]** Preconstruction has been mentioned by other folks, and I will mention it  
13 also. It is unclear under what authority NRC can offer the exemption for preconstruction  
14 activities when such impacts extend outside of NRC jurisdiction. For example, preconstruction  
15 activities will impact species protected under the Endangered Species Act, such as sage  
16 grouse, and others, and waters protected under the Safe Drinking Water Act, specifically the  
17 sole source aquifer, the eastern Snake River plain. The project must consult with agencies like  
18 EPA and the U.S. Fish and Wildlife Service, in order to analyze and release for public comment  
19 the environmental and public health impacts of preconstruction activities, including clearing,  
20 blasting, and grading, prior to conducting such activities.  
21

22 **[027-12, Sara Cohn]** Preconstruction Exemption: It is unclear under what authority NRC may  
23 offer exemptions for preconstruction activities when such impacts extend outside of NRC  
24 jurisdiction. For example preconstruction activities may impact waters protected under the Safe  
25 Drinking Water Act – the Eastern Snake River Plain Aquifer. The project must consult with EPA  
26 in order to ensure the preconstruction activities will not impact the Eastern Snake River Plain  
27 aquifer, a sole source aquifer for eastern Idaho.  
28

29 **[027-21, Sara Cohn]** Preconstruction Exemption: It is unclear under what authority NRC may  
30 offer exemptions for preconstruction activities when such impacts extend outside of NRC  
31 jurisdiction. For example preconstruction activities will impact sensitive and candidate species.  
32 Project impacts would normally require NRC to coordinate with the Idaho Department of Fish  
33 and Game in order to analyze and release for public comment the environmental and public  
34 health impacts of preconstruction clearing, blasting, and grading prior to conducting such  
35 activities. According to the draft EIS, such preconstruction activities are expected to take place  
36 prior to the licensing of the proposed facility. These efforts undermine the purpose of the EIS  
37 process. A mitigation plan must be created to avoid, minimize, and plan for mitigation of affected  
38 habitat.  
39

40 **[030-01, Kerry Cooke]** There is nothing in the EIS to suggest there is any reason for haste.  
41 There’s no emergency facing this country, or any other country, that this facility must be built as  
42 soon as possible. There’s -- I guess I’m just going to say, that I think that there’s -- there must  
43 be some proof laid out here, that there’s any reason to say work needs to start in October, when  
44 so many questions are left to be answered, so much is still -- we’re here talking to you tonight  
45 about effects on the environment, many questions we have about the road into it, transmission,  
46 and yet, you’re going to allow preconstruction. It’s totally puzzling to me, and I think really needs  
47 much more explanation, and I actually believe shouldn’t happen.  
48

1 **[030-06, Kerry Cooke]** Haste: What's the hurry? Why is the NRC allowing Areva to start a  
2 "preconstruction" phase this fall? During so-called preconstruction, the environment will be  
3 greatly disturbed. I appear before you today in good faith that a decision has not been rendered  
4 on this proposal, that all Verbal Comment will be considered, and that the EIS will be properly  
5 completed and vetted before a decision is reached. There is no emergency that demands that  
6 this project be fast-tracked, no national crisis dictating that rules be bent to allow early work.  
7 The haste shown by Idaho lawmakers in pushing through funding for a road to the Areva site,  
8 while not part of NRC domain, raises even higher my concern that decisions are being made by  
9 greed rather than science and sound energy and fiscal policy. There is no reason to start  
10 preconstruction before the EIS is released in final form.

11  
12 **[035-02, Steve Crowley]** In particular, I am concerned that the NRC will allow Areva to start  
13 "preconstruction" activities in October of 2010 - which would be before the Record of Decision is  
14 released. Moreover, preconstruction constitutes one part of a major federal action and 40 CFR  
15 1500.1(b) requires that information be available before an agency makes decisions or takes any  
16 action. The impacts of preconstruction must be evaluated in the draft EIS, or another EIS should  
17 be initiated to assess preconstruction impacts.

18  
19 **[048-04, Genevieve Emerson]** I am appalled that pre-construction would even remotely be  
20 considered as a viable option, as sage brush steppe can take a very long time to recover after it  
21 has been razed. I strongly feel that the citizens of Idaho need more time to consider the  
22 implications of such a facility, and pre-construction is extremely short-sighted and hasty.

23  
24 **[078-03, Hon. Wendy Jaquet]** 3. I thought the exemptions were excessive.

25  
26 **[086-01, Paula Jull]** The NRC has shown bias in allowing Areva to begin preconstruction  
27 activities before the decision has been made.

28  
29 **[087-01, Dennis Kasnicki]** Comment 1: At the subject meeting some attendees commented  
30 that the NRC giving AREVA a "preconstruction exemption" constituted a bias toward ultimate  
31 license approval. I totally agree. As paranoid as the NRC was regarding "appearances" (as I  
32 saw it when I was with Region II) I can't believe you guys got away with that one.

33  
34 **[088-07, Stan Kidwell; 095-07, Linda Leeuwrik; 122-06, Kathy O'Brien; 175-02, Ellen  
35 Thomas]** The NRC has demonstrated a clear bias toward licensing by granting Areva  
36 permission to begin "preconstruction" activities in October, long before any final decision has  
37 been made. The NRC must withdraw its permission to begin.

38  
39 **[105-02, Eve McConaughy]** Why were exemptions for pre-construction activities given prior  
40 to licensing?

41  
42 **[113-03, Ken Miller]** On the transmission issue, the NRC's exemption that authorizes AREVA  
43 to undertake preconstruction activities as not part of the proposed action should not include  
44 exempting utilities' installations including transmission lines and associated substations, and  
45 other utility infrastructure.

46  
47 **[113-14, Ken Miller]** As mentioned above, NRC erred in permitting AES to undertake myriad  
48 preconstruction activities as beyond the purview of the EIS. This is only one indication that the

1 NRC appears biased toward approval of the EREF application even as it is soliciting public  
2 comment and review of the Draft EIS. It is not too late for the NRC to remedy this egregious  
3 oversight – deliberate or otherwise – and to subject this project to a complete environmental  
4 review before any further preconstruction activities are allowed to take place.  
5

6 **[118-02, Caroline Morris]** The possibility of NRC’s allowing the contractor Areva to begin  
7 “preconstruction” activity in October 2010 troubles me, because it would predate release of this  
8 license’s Record of Decision. Clearly, preconstruction is one part of this major federal action.  
9 40 CFR 1500.1(b) requires agencies to release available information before making the  
10 pertinent decisions or taking relevant actions. This draft EIS must evaluate the preconstruction  
11 impact factors, since there is no time to initiate another EIS to consider preconstruction.  
12

13 **[144-02, Sara Rodgers]** Given that nuclear energy and the extraction of nuclear material  
14 create multi generational risk to human and environmental health, it is important to ensure all  
15 necessary precautions are taken seriously and that the preventative principle is the dominant  
16 paradigm when considering or planning their use. I am concerned that the NRC may allow  
17 preconstruction activities prior the adoption of the EIS. This is a poor use of wise decision  
18 making and resources. To demonstrate good faith efforts in preserving the health of Idaho and  
19 Idahoans, I request that no activities are undertaken until the EIS includes preconstruction  
20 activities and the entire EIS is adopted.  
21

22 Given that Areva corporation which desires this license and access to Idaho’s resources is an  
23 international firm with a poor environmental record, it is important to ensure no risk to domestic  
24 communities in case a environmental hazard occurs in the near or very long future. Since the  
25 risk of nuclear waste may occur for thousands of years, a prolonged planning process with  
26 thoughtful regulations to ensure no risk to domestic populations seems a small sacrifice than to  
27 start preconstruction without a well thought out and enforceable plan.  
28

29 **[148-01, Eric Schuler]** Taken as a whole, the EIS suggests that this facility will have a  
30 relatively low impact on the environment. Of course several aspects of this, of the — have been  
31 overlooked in making this conclusion. For instance, as others have already noted, it does not  
32 consider the impact of the exempted preconstruction activities, the high risk of wildfires in the  
33 area, or the lack of an appropriate disposal pathway for depleted uranium. Accordingly, the true  
34 impact of this facility is certainly larger than the DEIS suggests.  
35

36 **[153-11, Andrea Shipley]** Because of an exemption granted in March 2010, Areva will be  
37 allowed to start “preconstruction” activities as early as October 2010. This preconstruction  
38 exemption shows a bias towards licensing. It appears the NRC has already made the decision  
39 to allow the project to move forward even before the necessary impact assessments and public  
40 comment periods have been completed. (draft EIS, xxviii).  
41

42 Preconstruction constitutes one part of a major federal action. 40 CFR 1500.1(b) requires that  
43 information be available before an agency makes decisions or takes any action. Considering  
44 that public comment is open until September 13, 2010. It is impossible for the NRC to produce a  
45 final EIS and ROD before preconstruction starts in October.  
46

1 **[197-11, Andrea Shipley, on behalf of the Snake River Alliance]** Because of an exemption  
2 in March 2010, AREVA will be allowed to start preconstruction activities as early as October  
3 2010. This preconstruction exemption shows a bias toward the licensee.  
4

5 **[169-04, Margaret Stewart]** And it has been spoken about before that preconstruction activities  
6 by AREVA are a travesty to the public process of honest democracy. Allowing preconstruction  
7 activities to proceed without an analysis of the ensuing environmental and human effects shows  
8 a clear intention by the NRC to license this facility. And, to me, that appears to make a total  
9 sham of the impact assessments, and also of these public comments and hearings.  
10

11 **[181-23, Roger Turner]** NRC erred by approving pre-construction of AREVA before an EIS  
12 was provided to the public. The timing of an EIS is critical. CEQ regulations instruct agencies to  
13 “integrate the NEPA process with other planning at the earliest possible time to insure that  
14 planning and decisions reflect environmental values.” 40 CFR §1501.2 (1987). An EIS must be  
15 prepared “early enough so that it can serve practically as an important contribution to the  
16 decision-making process and will not be used to rationalize or justify decisions already made.”  
17 *Andrus*, 442 U. S., at 351–352, n. 3 (quoting 40 CFR §1502.5 (1979)).  
18

19 BY NRC already approving pre-construction designs, they have showed that they are using the  
20 EIS to rationalize or justify decisions already made. Federal funds have already been spent on  
21 this project, before the EIS was available to the public. This is in violation of NEPA.  
22

23 **[184-16, Kitty Vincent]** Because of an unwarranted exemption granted in March 2010, Areva  
24 will be allowed to start “preconstruction” activities as early as October 2010. This  
25 preconstruction exemption shows a bias toward licensing. It appears the NRC has already  
26 decided to allow the project to move forward even before the necessary impact assessments  
27 and public comment periods have been completed. (draft EIS, xxviii). Preconstruction  
28 constitutes one part of a major federal action. 40 CFR 1500.1(b) requires that information be  
29 available before an agency makes decisions or takes any action. Considering that public  
30 comment is open until September 13, 2010. It is impossible for the NRC to produce a final EIS  
31 and ROD before preconstruction starts in October.  
32

33 **[184-21, Kitty Vincent]** The Idaho Department of Fish and Game, in a response to NRC dated  
34 April 14, reaffirmed the threats transmission lines would pose to wildlife (draft EIS B-26) and  
35 challenges the methodology of sage grouse and leak analysis in the EIS (B-27), recommends  
36 burying transmission lines, and suggests Areva submit to plans to mitigate for the expected  
37 wildlife impacts. These concerns do not appear to have been addressed in this EIS and must be  
38 addressed before any preconstruction activities are allowed or before this EIS review continues.  
39

40 **[191-01, Liz Woodruff]** Most importantly, preconstruction cannot begin in October 2010. That  
41 would be a completely unacceptable outcome of these proceedings.  
42

43 **[191-05, Liz Woodruff]** Moreover, preconstruction plans must be halted and no  
44 preconstruction activities should be allowed until an evaluation of the environmental impacts of  
45 those activities has been integrated into an EIS. To allow preconstruction in October of 2010 is  
46 unacceptable, and I believe such action will be adamantly opposed by residents of the state....  
47

48 • Because of an exemption granted in March 2010, Areva will be allowed to start  
49 “preconstruction” activities as early as October 2010. This preconstruction exemption shows a



1 bias towards licensing. It appears the NRC has already made the decision to allow the project to  
2 move forward even before the necessary impact assessments and public comment periods  
3 have been completed. draft EIS, xxviii)

4  
5 • Preconstruction constitutes one part of a major federal action. 40 CFR 1500.1(b) requires that  
6 information be available before an agency makes decisions or takes any action. Considering  
7 that public comment is open until September 13, 2010. It is impossible for the NRC to produce a  
8 final EIS and ROD before preconstruction starts in October. The NRC must either revise the  
9 current draft to include the impacts of preconstruction or must write an additional EIS that  
10 specifically addresses preconstruction activities. The NRC should not allow preconstruction to  
11 commence until after a ROD is filed....

12  
13 • The draft EIS (draft 4-5) notes that “The greatest potential for impacts on historic and cultural  
14 resources would occur during ground disturbance during preconstruction.” Yet these  
15 preconstruction activities are specifically removed from review in this study. *Again, the impacts  
16 of preconstruction must be integrated into this draft EIS.*

17  
18 **[193-15, Liz Woodruff, on behalf of the Snake River Alliance]** AREVA was given an  
19 unwarranted exemption, granted in March of 2010, to start preconstruction activities as early as  
20 October of this year, two months away. This preconstruction exemption shows a bias towards  
21 licensing, without hearing public comment first.

22  
23 But preconstruction constitutes one part of a major federal action. 40 CFR 1500.1(b) requires  
24 that information be available before an agency makes decisions or takes any action.

25  
26 The NRC cannot simply grant an exemption for activities with excessive environmental impacts.

27  
28 If you look at the EIS, all the environmental impacts happen in preconstruction, and then they  
29 aren't being taken into consideration, in the EIS, as an area of impact because we granted an  
30 exemption for those impacts.

31  
32 And they must either include preconstruction in the EIS, or write an additional EIS to evaluate  
33 preconstruction impacts. Preconstruction activities cannot occur until the impacts are analyzed,  
34 and the record of decision is signed, and your comments getting in on September 13th will  
35 certainly not give them adequate time before preconstruction starts to issue a record of  
36 decision, and this is unacceptable.

37  
38 **[193-19, Liz Woodruff, on behalf of the Snake River Alliance]** Now this is something that's  
39 considered as a preconstruction impact in EIS, so this isn't given the weight and the technical  
40 impact review, the small, moderate, and large that you saw.

41  
42 But more specifically, in the EIS, in Appendix B, the Idaho Department of Fish and Game affirms  
43 that the threat to transmission lines would be great for wildlife, and they recommend barring  
44 transmission lines and suggest AREVA submit to plans to mitigate for the expected wildlife  
45 impacts. These concerns must be addressed in the EIS, before any preconstruction activities  
46 are allowed.

1 **[193-20, Liz Woodruff, on behalf of the Snake River Alliance]** And all of the issues  
2 associated with the construction of this facility -- accidents, fire, air and water quality  
3 degradation, the development of this land will impact several species, including raptors and  
4 sagebrush obligate species. This includes the sage grouse. The sage grouse is a candidate  
5 species for federal protection, and the only reason it's not listed yet is because of bureaucratic  
6 process of listing. There's a delay. But the treatment of this issue is inadequate in the draft EIS.

7  
8 The impacts to sage grouse from transmission and preconstruction warrant integration into this  
9 EIS, or separate EISs, specifically around preconstruction and transmission issues.

10  
11 **[192-14, Lisa Young]** Indeed, I hope to see preconstruction activities prohibited until a further  
12 analysis of the environmental impacts of these activities can be fully evaluated, and until the  
13 facility is actually licensed (a rather logical notion, I think).

14  
15 **Response:** *On March 17, 2010, the NRC granted AES an exemption from the requirements of*  
16 *the regulations under 10 CFR 30.4, 30.33(a)(5), 40.4, 40.32(e), 70.4, and 70.23(a)(7), which*  
17 *govern the commencement of construction (NRC, 2010c). This action was in response to AES's*  
18 *request dated June 17, 2009 (AES, 2009b), as supplemented by letter dated October 15, 2009*  
19 *(AES, 2009c), that requested an exemption from specific requirements of 10 CFR Parts 30, 40,*  
20 *and 70 to allow AES to commence certain construction activities associated with the proposed*  
21 *EREF before completion of the NRC's environmental review under 10 CFR Part 51. The*  
22 *exemption authorizes AES to conduct the specified preconstruction activities, provided that*  
23 *none of the facilities or activities subject to the exemption would be components of AES's*  
24 *Physical Security Plan or its Standard Practice Procedures Plan for the Protection of Classified*  
25 *Matter, or otherwise be subject to NRC review or approval.*

26  
27 *As discussed in the March 17, 2010, exemption approval, the NRC staff determined that*  
28 *granting AES's exemption request is authorized by law; and has reasonable assurance that*  
29 *granting the exemption request would not endanger life or property or the common defense and*  
30 *security, and is otherwise in the public interest. Also, pursuant to 10 CFR 51.32, the*  
31 *Commission has determined that the granting of this exemption will not have a significant effect*  
32 *on the quality of the human environment.*

33  
34 *Approval of the exemption request does not indicate that a licensing decision has been made by*  
35 *the NRC. Preconstruction activities would be completed by AES with the risk that a license may*  
36 *not be issued. Some of the preconstruction activities may be deferred by AES until, or continue*  
37 *after, the commencement of construction, if a license is issued. Before a license would be*  
38 *granted, the Final EIS must be issued, and the ASLBP must review the NRC staff's SER*  
39 *(NRC, 2010b) and Final EIS, conduct mandatory hearings on the staff's safety and*  
40 *environmental reviews, and issue adjudicatory decision(s), which are subject to Commission*  
41 *review.*

42  
43 *Although the exemption allows AES to proceed with certain activities that are considered*  
44 *outside of NRC regulatory purview (they are not related to radiological health and safety or the*  
45 *common defense and security) before obtaining an NRC license to construct and operate the*  
46 *proposed EREF, the potential impacts of preconstruction were fully and accurately analyzed in*  
47 *detail, in Section 4.2 of the Draft EIS. In addition, other Federal agencies, the Shoshone-*  
48 *Bannock Tribes, and State and local government agencies have been consulted or otherwise*  
49 *contacted regarding these impacts and the other impacts of the proposed project, as required.*

1 *The Federal, State, and local agencies with jurisdiction over, or other interest in, the*  
2 *preconstruction activities, and the Shoshone-Bannock Tribes, have reviewed the Draft EIS and*  
3 *have raised no objections to the preconstruction exemption. By law, AES is required to obtain*  
4 *all other required Federal, State, and local permits and approvals in order to conduct*  
5 *preconstruction activities.*  
6  
7

### 8 **I.5.6 Nuclear Proliferation**

9

10 **Comment:** The following comments relate to issues and concerns about proliferation and  
11 nuclear weapons development related to the uranium enrichment technology and enriched  
12 uranium product of the proposed EREF.  
13

14 **[015-17, Beatrice Brailsford; 191-24, Liz Woodruff]** The NRC should produce an unclassified  
15 non-proliferation assessment for the Areva enrichment plant. To refuse to do so based on the  
16 fact that Areva intends to enrich uranium to no more than 5% misses an important point. Gas  
17 centrifuge uranium enrichment is a proliferable technology. A comparable case occurred in  
18 Idaho during the environmental evaluation of pyroprocessing. In that instance, no one was  
19 arguing that the DOE intended to recover pure plutonium. But, because pyroprocessing is a  
20 proliferable *technology*, the DOE produced a non-proliferation assessment as part of the final  
21 EIS on the *facility*.  
22

23 **[029-02, Richard Conner; 063-04, Martha Haga; 099-02, Brent Mathieu; 100-07, Wendy**  
24 **Matson; 112-02, Mark Menlove; 161-04, Marisa Smith; 199-02, Dina Bond; 200-02, Sean**  
25 **Campbell; 201-02, Giovanna Campos; 203-02, Danielle Dugge; 204-02, Susan Filkins;**  
26 **207-02, Drew Harris; 208-02, Emily Harvey; 213-02, Darvel Jones; 214-02, Jacob King;**  
27 **216-02, Beau Lee; 218-02, David Minick; 219-02, Neil Miyaoka; 220-02, Tim Naftzger;**  
28 **221-02, Mike Perrington; 223-02, Mason Richens; 226-02, Jessica Toinga; 227-02,**  
29 **Joseph Voss]** The draft EIS is inadequate and fails to address the fact that uranium enrichment  
30 is a technology used for proliferation. The NRC should produce an unclassified non-proliferation  
31 assessment for the EREF. To refuse to do so based on the fact that Areva intends to enrich  
32 uranium to no more than 5% misses an important point: Gas centrifuge uranium enrichment is a  
33 proliferable technology and precedents exist for nonproliferation assessments of proliferable  
34 technology whether the license allows for proliferation or not.  
35

36 **[044-01, Dennis Donnelly]** I would point out that this section of considering alternatives  
37 assumes that it has to supply enriched uranium for national energy security; that is, they  
38 assume that this plant is going to be built, and it neglects the alternative of not building these  
39 plants.  
40

41 I would point out that if you build this facility, it commits America, this is the unstated thing, it  
42 commits America essentially to a future that includes nuclear power, and all the nightmares  
43 associated with it. I would like to point out that there are other options that some of the  
44 nightmares would be a police state in our communities, where the Soviet Russians and the  
45 Germans that we already have that police state. These things are so dangerous that we're  
46 considering bombing Iran and the Israelis are considering bombing Iran for exactly the same  
47 facility. It's so dangerous. The reason is, of course, that you build this facility, and then you build  
48 the reactors, the reactors breed plutonium, plutonium can make weapons. You can't take that  
49 away once you've done it.  
50

1 The police state is a terrible thing. The rest of it has to do with the threat of military attack on  
2 these facilities, on the plants. Nobody seems to address that all these atomic power plants are  
3 built above ground. Any kind of terrorist or military attack on any one of them can take out two  
4 states, that much area. We've seen Chernobyl. We know it can happen, and it has happened.  
5 Even accidents can take out a large area. Right now we have major problems still from  
6 Chernobyl, and everyone knows it.

7  
8 I would like to point out there are alternatives that have not been considered, that I'd like to  
9 mention. A couple of weeks ago, there was an announcement in the "New York Times", and I  
10 followed it up, and yes, it's true, there was a study in North Carolina that concluded for the first  
11 time that new power plants in North Carolina were cheaper to build with solar power than with  
12 nuclear power. This is a major crossover point that should be considered. And you see there are  
13 none of the problems, there are no activation products, there are no fission products, there are  
14 no actinides, there is no pluming of unmanageable wastes that we're casting into the future for  
15 all of geologic time that require management and armies to manage them. None of the  
16 problems if you go with solar power, and with -- instead of nuclear power. And I would urge  
17 everyone to consider personally their own career options right now.

18  
19 If we go ahead with this plant, we're committing to a future that dumps unmanageable problems,  
20 and a police state on the future of this country, and every country. Whereas, if we do the  
21 unspoken thing, let all our aging and outdated nuclear plants expire, and then use clean energy,  
22 non-carbon energy for the future, and not this totally toxic nuclear energy.

23  
24 **[050-14, Joanie Fauci]** The last point I wish to have addressed in the EIS concerns the  
25 enriched uranium product. As this material has the potential to be used in nuclear weapons, I  
26 ask that the NRC make it a requirement of the license that the enriched uranium is not to leave  
27 US soil.

28  
29 **[061-01, Nancy Greco]** I am very concerned about the possibility that Areva, a French owned  
30 company, can quite possibly put our country in danger by opening the way to nuclear weapon  
31 development.

32  
33 **[067-07, Mike Hart]** With respect to proliferation, I am a member, or I was a member, of the  
34 Global Freeze Movement. I'm a member of Global Zero. I don't like nuclear weapons. I have  
35 concerns about proliferation, but not for this project. Uranium enrichment is going to occur  
36 throughout the world because there will be nuclear energy throughout the world. I would like to  
37 see that enrichment occur in the United States, and I think if there's any place the bad guys  
38 won't find enrichment technology, and proliferate nuclear technology to weapons it would be  
39 right here in Idaho Falls. I just don't see that technology escaping our backyard. So, I think with  
40 respect to proliferation, the NRC probably should give credit to this facility, because it will be  
41 contained, and by having proliferation -- by having enrichment here, there would be far fewer  
42 proliferation concerns for my part. I'd much rather have the global nuclear fuel cycle provided by  
43 the United States, even if we do export the fuel.

44  
45 **[071-02, David Hensel]** A big concern I have with nuclear power is the risk of weapons  
46 proliferation. And I don't think the EIS does a very good job of addressing that. The Federation  
47 of American Scientists call, and I'm going to quote here, "Gas Centrifuge Uranium Enrichment  
48 an open road to a nuclear weapon." It is what they consider breakout technology, meaning that  
49 a plant that enriches uranium for nuclear power production can also be used to convert uranium

1 to a level rich enough to be used in a weapon. Once the feedstock has been raised to what you  
2 guys call a low-level of enrichment, you're more than halfway to the point of being able to  
3 produce weapons-grade uranium.  
4

5 The gas centrifuge plants like AREVA is talking about using are definitely more efficient than the  
6 old methods, but they're also smaller, easier to hide. They do use less electricity and less water,  
7 which is a great thing, but it also means that it's more difficult to detect where they're being  
8 used, and where they're being used in a manner that's not appropriate. And I think Iran has  
9 come up several times, and it's going to be one of the flashpoints in the world, and it's all about  
10 this technology that we're discussing here. And I'm not worried about what's going to happen  
11 over here as far as producing nuclear-grade uranium. We have other ways of doing that, but I  
12 think we need to pay attention to our perception with the rest of the world. The United States, for  
13 better or worse is no longer the only big guy on the block. And if you look at the people that  
14 have nuclear weapons now, nuclear power generation was the path, whether they did it  
15 dangerously or not, to get to their nuclear weapons capabilities....  
16

17 One thing I would specifically like to ask you to do, I think you, the NRC, should produce an  
18 unclassified non-proliferation assessment for this plant. And I know that the talk has been well,  
19 the uranium is only going to be enriched to 5 percent, so it's not a proliferation risk, but that  
20 does miss the point. It's a proliferable technology. And a few years ago, a decade ago, or  
21 whatever, there was the pyroprocessing plant that the Department of Energy was going to build  
22 here. No one was saying that they were going to make weapons grade plutonium, but they did  
23 this assessment because the process that they were doing was a proliferable technology. And I  
24 really think that you should do this, and provide it in a non-classified manner, and provide that to  
25 the public.  
26

27 **[088-06, Stan Kidwell; 095-06, Linda Leeuwrik; 175-05, Ellen Thomas]** Gas centrifuge  
28 uranium enrichment is a technology the Federation of American Scientists calls "an open road  
29 to a nuclear weapon." At the very least, the Nuclear Regulatory Commission must produce an  
30 unclassified proliferation assessment of Areva's plant.  
31

32 **[096-03, Arjun Makhijani]** Finally, I would just remind you that there needs to be a non-  
33 proliferation section in this. The non-proliferation is dismissed by saying 5% uranium cannot be  
34 used to make weapons. This is completely correct, of course. But it has been the foreign policy  
35 of this country with respect to Iran that a commercial enrichment plant has a proliferation risk,  
36 even though they say, rightly or wrongly, which is a separate issue, that they're building a  
37 commercial plant for commercial purposes. It's different to build a commercial enrichment plant  
38 in a weapon state that's got surplus highly enriched uranium, completely different, but it has to  
39 be part of your analysis. You can't say -- you can't undermine US-Foreign policy by saying  
40 5 percent enrichment plant is not a proliferation issue, because you can't make weapons with  
41 5 percent enrichment. You change the valving arrangement in the enrichment plant, you can  
42 make 90 percent enriched uranium. And you know that, and I know that. You can't ignore  
43 this very critical problem in your haste to give a license, and undermine non-standing  
44 U.S. non-proliferation policy.  
45

46 **[098-05, Linda Martin; 098-14, Linda Martin]** In addition, there is no evidence of any danger  
47 or threat of nuclear proliferation from the design, construction, or operation of the proposed  
48 facility.  
49



1 **[103-07, Karen McCall]** A uranium enrichment plant can easily be converted into to making  
2 bombs. This is an unacceptable possibility for nuclear proliferation.

3  
4 **[108-01, John McMahon]** • The USA spent \$5+TRILLION on Nuclear Weapons and related  
5 technology since 1945. This is an astounding waste of our Nations' engineering skill and  
6 industrial capability!

7  
8 The Obama administration apparently has already decided to enrich Uranium, something we  
9 may even go to war over (again!!) to prevent the Iranians from doing! This can only mean the  
10 US Congress will give its "blessing"(?) [The same "blessing" they gave to Custer and Generals  
11 Crook and Miles]. Only this time it will be to make new Nuclear Weapons.

12  
13 • This is unacceptable in light of our having just recently re-negotiated the Strategic Arms  
14 Reduction Treaty (START) with Russia, et al.

15  
16 • If the United States continues to enrich Uranium it does not need (or use) for Power  
17 production and nuclear weapons retrofits, or God forbid, "New" N-Weapons, then this is  
18 the height of fear mongering stupidity.

19  
20 • This is not about our National Defense or our Energy Policy!

21  
22 • It is irresponsible fiscal treachery! Taxpayers will revolt once they learn the true motives  
23 for the Eagle Rock Enrichment Facility!

24  
25 Here in Idaho we can and will mount a campaign to unseat some or all of the Four Horsemen of  
26 the Apocalypse we send to the US Congress, especially since they are receiving heaps of filthy  
27 lucre from the special interests promoting the Areva boondoggle!

28  
29 **[131-05, Morty Prisament]** Proliferation and Terrorism: The draft EIS fails to adequately  
30 address the fact that uranium enrichment is a technology used for proliferation. The NRC should  
31 produce an unclassified non-proliferation assessment for the EREF. To refuse to do so, based  
32 on the fact that Areva intends to enrich uranium to no more than 5%, misses an important point:  
33 Gas centrifuge uranium enrichment is a proliferable technology and precedents exist for non-  
34 proliferation assessments of proliferable technology, whether the license allows for proliferation  
35 or not. NRC is aware that enriching uranium from commercial to weapons-grade is hardly a  
36 formidable obstacle. In fact, the enrichment process becomes exponentially easier as levels of  
37 enrichment increase. Moreover, the new centrifuge technology essentially doubles this nuclear  
38 enrichment capability. These are the very issues that the U.S. is concerned about in the case of  
39 Iran's nuclear program. Absent a thorough analysis of proliferation and terrorism issues, the  
40 DEIS would be clearly inadequate.

41  
42 **[147-12, Joey Schueler]** 8. Enriched Uranium is one of the critical components required for  
43 nuclear weapons: [http://en.wikipedia.org/wiki/Enriched\\_uranium](http://en.wikipedia.org/wiki/Enriched_uranium). Bringing this component to  
44 Idaho means an increased risk of terrorist threat and/or at least the assistance in nuclear  
45 proliferation.

46  
47 16. This one's more personal, but my mom taught me to be a "lover not a fighter" and the  
48 product of this plant can be used to devastate entire civilizations (I say this on the 65th

1 anniversary of the bombing of Hiroshima and Nagasaki). We only just now sent a representative  
2 from the U.S. to stand with the Japanese people in remembrance to those hundreds of  
3 thousands of innocent civilians killed by this action. This is an important step in the United  
4 States diplomatic stance with the world. Why do we insist on undermining it by not practicing  
5 what we preach in regards to nuclear non-proliferation? In the words of a beautiful woman who  
6 made public comment at the EIS hearing who had been notified of her potential exposure to  
7 radiation by the government near the Hanford Nuclear Plant, "Such Hubris". Can't we find a  
8 better path? Is the money too good?

9  
10 **[168-05, Lon Stewart]** If this is a similar type of enrichment plant that Iran has built, and the US  
11 is contemplating war over this issue, why would the US allow such a plant to be built on their  
12 shores? We are having enough problems world wide, why create more problems for ourselves.  
13 There are no huge benefits for the US in this venture. This does not sound good to me.

14  
15 **[175-06, Ellen Thomas]** Areva's plant would not increase US energy security or  
16 nonproliferation by providing a "domestic" source of enriched uranium. Areva is owned by the  
17 French government. The raw material for the plant would be imported. Some portion of its  
18 product would be exported.

19  
20 **[181-12, Roger Turner]** The Draft EIS States that nuclear proliferation was dropped from the  
21 scope of this EIS:

22  
23 In the case of nonproliferation, the intent of constructing and operating the EREF is to produce  
24 uranium enriched in uranium-235 up to approximately 5 weight percent for use in commercial  
25 nuclear reactors, as mentioned in Section 1.2. This level of enrichment is not sufficient to  
26 produce nuclear weapons. Nonproliferation is therefore out of scope.

27  
28 The Non Proliferation Treaty (NPT) Signed by the U.S. and 188 other countries, provides,  
29 among other thing, that members will: Provide assurance through the application of international  
30 safeguards that peaceful nuclear energy in NNWS will not be diverted to nuclear weapons or  
31 other nuclear explosive devices. The centrifuge technology violates this agreement. The NPT is  
32 an indispensable legal and political instrument in preventing further proliferation of nuclear  
33 weapons. In the absence of the NPT, many other countries might well acquire nuclear weapons.  
34 Without the NPT safeguards requirements, monitoring and inspections of nuclear materials and  
35 facilities in non-nuclear weapon states would be significantly weakened.

36  
37 Although the 5% level of enrichment is not sufficient to produce nuclear weapons, the simple  
38 addition of more centrifuge units, or a re-arrangement of the cascade system, may render such  
39 a facility capable of producing weapons-grade Uranium. Consequently, the draft EIS erred in not  
40 addressing the proliferation potential of this project. The Treaty on the Non-Proliferation of  
41 Nuclear Weapons, also Nuclear Non-Proliferation Treaty (NPT or NNPT) is a treaty to limit the  
42 spread (proliferation) of nuclear weapons. The treaty came into force in 1970, and currently there  
43 are 189 states party to the treaty, five of which are recognized as nuclear weapon states: the  
44 United States, Russia, the United Kingdom, France, and China. Four nonparties to the treaty  
45 are known or believed to possess nuclear weapons.

46  
47 Monitoring and verification is very important under the Treaty and it would be improbable that  
48 the U.S. or the International Atomic Energy Agency (IAEA) could count the centrifuge units or

1 the analyze the way that a facility would carry out repeating cycles through the centrifuge units  
2 to achieve weapons grade Uranium.

3  
4 Consequently, the issue of enrichment through the centrifuge method, must be reviewed and  
5 added to the EIS review. The NRC is obligated through NEPA to review the proliferation risks of  
6 this technology, and it violates the principles of the Treaty, be dropped from the alternatives. If  
7 the project is approved at all, the EIS should review other technologies that eliminate the  
8 proliferation threat that this one poses.

9  
10 **[184-09, Kitty Vincent]** Given this information, the Alliance believes the NRC should produce  
11 an unclassified non-proliferation assessment for EREF. To refuse to do so based on the fact  
12 that Areva intends to enrich uranium to no more than 5% misses an important point: Gas  
13 centrifuge uranium enrichment is a proliferable technology. A comparable case occurred in  
14 Idaho during the environmental evaluation of pyroprocessing. In that instance, no one was  
15 arguing that the DOE intended to recover pure plutonium. But because pyroprocessing is a  
16 proliferable *technology*, the DOE produced a non-proliferation assessment as part of the final  
17 EIS on the *facility*.

18  
19 **[192-15, Lisa Young]** Indeed, I hope to see a nonproliferation assessment devised to address  
20 the fact that this plant will have the technology and the capability to enrich the uranium  
21 hexafluoride to *beyond* the indicated 5%, posing an unacceptable proliferation risk (this is not *at*  
22 *all* assuming that AREVA or America or any other party would assuredly *proceed* with this  
23 process, but is merely recognizing the fact that this risk *exists* and because the consequences  
24 of such a risk are so extremely significant, the least that needs to be done is a formal  
25 assessment of the situation).

26  
27 **[193-16, Liz Woodruff]** But the NRC should produce an unclassified nonproliferation  
28 assessment for the EREF, because gas centrifuge uranium enrichment is a proliferation  
29 technology. A comparable case occurred in Idaho during the environmental evaluation of  
30 pyroprocessing.

31  
32 In that instance, no one was arguing that the DOE intended to recover pure plutonium, but  
33 because pyroprocessing is a proliferable technology, the DOE produced a nonproliferation  
34 assessment as part of the final EIS on the facility. And we are asking that the NRC include a  
35 nonproliferation assessment on this facility as well. Why? This is a demonstration of the rapidity  
36 with which you can move from the generation of fuel for power reactors to fuel for weapons, a  
37 key ingredient in weapons.

38  
39 Each one of these rows is a cascade. Each one of these bars is a centrifuge, those big things  
40 they use to enrich the uranium; right?

41  
42 So you need 24 cascades to enrich uranium to fuel grade, and you can see as we go in a linear  
43 fashion toward, you need two cascades to get it to weapons grade.

44  
45 In other words, it's incredibly efficient technology for producing material that's a key ingredient in  
46 nuclear weapons, and this underscores the point of why a nonproliferation assessment must be  
47 included in the EIS, and is currently lacking.

1 **Response:** *In response to the above comments, the NRC staff provides the excerpt below from*  
2 *an August 25, 2010, letter from Chairman Gregory B. Jaczko of the NRC to the Honorable John*  
3 *M. Spratt, Jr., Congressman, U.S. House of Representatives (NRC, 2010d). This letter was in*  
4 *response to Congressman Spratt’s June 30, 2010, letter (Spratt et al., 2010) in which he*  
5 *requested that the NRC conduct a nuclear nonproliferation assessment as part of the review of*  
6 *license applications for new nuclear technologies.*

7  
8 *“The NRC has adopted a comprehensive regulatory infrastructure and implements an*  
9 *integrated set of activities directed against the unauthorized disclosure of information*  
10 *and technology considered important to common defense and security and the diversion*  
11 *of nuclear materials inimical to public health and safety and the common defense and*  
12 *security. The NRC’s key regulations in this area (10 CFR Parts 73, 74, and 95) provide*  
13 *comprehensive requirements governing the control of, and access to, information,*  
14 *physical security of materials and facilities, and material control and accounting. Other*  
15 *NRC regulatory requirements are directed at preventing unauthorized disclosure of*  
16 *classified information, safeguards information (SGI), and sensitive unclassified*  
17 *nonsafeguards information. As appropriate, the NRC may supplement these*  
18 *requirements by order consistent with its statutory obligation to protect the common*  
19 *defense and security and public health and safety.*

20  
21 *“Beyond the NRC’s regulations, uranium enrichment facility licensees have voluntarily*  
22 *committed to implement additional measures to protect information associated with*  
23 *classified enrichment technologies. The Nuclear Energy Institute developed a guidance*  
24 *document for the enrichment facility licensees and certificate holders which the NRC*  
25 *staff has endorsed. Licensees are now implementing these additional measures and*  
26 *incorporating their commitments in their site security plans. These additional measures*  
27 *and commitments become part of their licensing basis. In addition, the staff is working*  
28 *with other agencies to provide additional Federal involvement in protecting uranium*  
29 *enrichment technologies and establishing information protection measures.*

30  
31 *“Given the NRC’s comprehensive regulatory framework, ongoing oversight, and active*  
32 *interagency cooperation, it is the NRC’s current view that a formal nuclear*  
33 *nonproliferation assessment would not provide any additional benefit to protection of the*  
34 *common defense and security....*

35  
36 *“I want to assure you that the NRC takes your concerns very seriously and that we will*  
37 *continue to regulate nuclear materials and sensitive technology to ensure protection of*  
38 *public health and safety and the environment, promotion of the common defense and*  
39 *security, and fulfillment of U.S. obligations for nonproliferation and international*  
40 *agreements.”*

### 41 42 43 **I.5.7 Alternatives Considered but Eliminated**

44  
45 **Comment:** *The following comments suggest that the proposed action is unnecessary because*  
46 *the current U.S. program to purchase and downblend Russian highly enriched uranium could be*  
47 *extended.*

1 **[096-04, Arjun Makhijani]** Alternatives are not considered. This is also not in conformity with  
2 the National Environmental Policy Act. You've eliminated alternative by fiat, saying we're not  
3 going to have down blending of surplus HEU ...  
4

5 **[147-18, Joey Schueler]** 14. The United States currently purchases enriched Uranium from  
6 Russia for use in the few facilities it does have. While this may sound negative at the outset, we  
7 are actually aiding Russia in downsizing its nuclear arsenal, which only further secures the  
8 United States due to the instability of such a vast arsenal of weapons that could be sold on the  
9 black market to terrorists or foreign Para-military groups. Enriching our own Uranium devalues  
10 this peace seeking process and results in excessive storage of a highly toxic chemical on our  
11 soil.  
12

13 **[131-03, Morty Prisament]** Need for Action: The DEIS has not established a "need" for this  
14 action, as required under NEPA. Need is required to be discussed in specific, quantitative,  
15 terms and within the scope of global production and markets. there exists a competitive global  
16 market to provide enriched uranium. Russia (CIS) has been one of the leading suppliers of  
17 enriched U2. If there is a national security rationale for building such facilities in the U.S., the  
18 EIS needs to discuss and document such an assertion. Moreover, the document needs to  
19 explore the reasons why the supply of enriched U2 from nuclear weapons decommissioning  
20 could not meet projected demand for enriched U2.  
21

22 **[148-02, Eric Schuler]** But there's a bigger issue here. Before we can ask whether the impact  
23 will be small or devastating, we need to ask why we're making an impact at all. This question is  
24 paramount, but the draft EIS failed to provide a convincing answer. The EIS claims that the  
25 EREF needs to be build to improve national security. For this to be a legitimate need, however,  
26 the U.S.'s supply of enriched uranium would have to be unreliable currently. This is not the  
27 case.  
28

29 The U.S.'s enriched uranium sources are reliable partners and the U.S. even seems to tacitly  
30 acknowledge this fact, when it states that some of the enriched uranium will be exported to  
31 foreign countries. Even so, it is useful to evaluate the sources more fully, just to understand just  
32 how unnecessary this facility is.  
33

34 Now we've heard earlier that 90 percent of our enriched uranium is imported, and about half of  
35 that is from Russia, and we've also heard that uranium enrichment is a necessary technology  
36 because we need nuclear power to deal with global warming.  
37

38 However, strictly speaking, that's not true, as a great example of that is the megatons to  
39 megawatts program that we operate with Russia. This is an agreement between Russia and the  
40 U.S. where by Russian nuclear warheads are downblended to make fuel grade uranium, and  
41 thus, since we have an abundant supply of warheads, is a very bountiful source of this  
42 enrichment – or of enriched uranium. Moreover, this program diminishes the threat of  
43 proliferation and prevents the environmental degradation associated with continued mining.  
44

45 In other words, it's beneficial in many ways, and it's been existing for several years and there is  
46 no reason to expect that it would not be renewed in the future.  
47



1 The other enriched uranium sources are also reliable. Although much of the enriched uranium  
2 is, indeed, imported, this fact alone does not indicate instability. We live in an age of  
3 globalization and there is no international market for enriched uranium. Credit counseling with a  
4 comparative advantage in the production of enriched uranium, whether because they have  
5 highly-accessible reserves, low-cost labor in Africa, or other factors, will specialize in producing  
6 enriched uranium while the U.S. focuses its resources in other areas, like agriculture.

7  
8 Our reliance on this market is not a sign of weakness or vulnerability, but a sign of efficiency.  
9 Energy independence is an outdated idea, is one that is not based on security or patriotism, but  
10 of ignorance.

11  
12 The current system works, and has worked for several years. The entire project that we are  
13 discussing here tonight is predicated on the assertion that it will provide national energy security  
14 with respect to enriched uranium.

15  
16 The fact of the matter is that this security already exists and the EREF facility is not necessary,  
17 and if the benefits stated in this proposal do not exist, no amount of environmental impact is  
18 tolerable, and this facility cannot be licensed.

19  
20 **[181-13, Roger Turner]** Add Alternative to extend the Megatons to Megawatts Program in  
21 order to supply the U.S. with enriched Uranium. The EIS should re-evaluate interest by the U.S.  
22 to extending the Megatons to Megawatts program in order to obtain enriched uranium. The EIS  
23 should re-evaluate the possibility of receiving other Foreign supplies of enriched uranium to  
24 supply the U.S. needs.

25  
26 **Response:** *Downblending of Russian highly enriched uranium under the Megatons to*  
27 *Megawatts Program is an issue of national energy policy and is set to expire in 2013, as*  
28 *discussed in Sections 1.3.1, 2.2, and 2.3.2.2 of the EIS. As such, this alternative does not fulfill*  
29 *the need for the proposed action because it does not meet the objective of developing a reliable*  
30 *domestic source of low enriched uranium to fulfill electricity generation requirements.*  
31 *Therefore, it is not considered a viable alternative to enriched uranium from the proposed EREF*  
32 *and, therefore, was eliminated from further consideration in the EIS.*

### 33 34 35 **I.5.8 Land Use**

36  
37 **Comment:** The following comment expresses concern that farm land would be lost if the  
38 proposed EREF project goes forward.

39  
40 **[036-07, Christina Cutler, on behalf of the Shoshone-Bannock Tribes]** Also the loss of farm  
41 land needs to be addressed. Loss of farm is and will continue to be an issue in this country, we  
42 need to address the impact that loss has and how AREVA plans to mitigate the loss.

43  
44 **Response:** *As stated in Section 4.2.1.1, approximately 202 hectares (500 acres) of farm land*  
45 *would be lost due to construction and operation of the proposed EREF. The impacts of this loss*  
46 *would be SMALL because that area constitutes approximately 0.25 percent of the land currently*  
47 *cultivated in Bonneville County. In addition, the current zoning for the area is compatible with*  
48 *the use for which the proposed EREF is intended.*

1 **Comment:** The following comment expresses concern about the likely, permanent loss of BLM-  
2 managed public land to wildlife and to wildlife-related recreation access due to the construction  
3 and operation of the proposed project  
4

5 **[089-06, Sharon Kiefer, on behalf of the Idaho Department of Fish and Game]** Loss of  
6 Public Lands to Public Access - The Department remains concerned about the likely, permanent  
7 loss of public land to wildlife and to wildlife-related recreation access due to the construction and  
8 operation of the proposed project. There is a BLM owned and managed parcel of land entirely  
9 within the property boundary. Concerns regarding the loss of this parcel from wildlife-related  
10 recreation and BLM management could be mitigated by the project proponent exchanging a  
11 similar acreage outside the project area to be managed by BLM for multiple uses including  
12 wildlife habitat and wildlife-related recreation. We are willing to work with AES and other parties  
13 to pursue a solution but do not believe delay of the DEIS process and facility consideration is  
14 necessary to address this issue.  
15

16 **Response:** *Development of the proposed EREF would not alter the current situation on the*  
17 *BLM-owned parcel of land, and BLM's access to this land will be unaltered (AES, 2010a). No*  
18 *licensed activities will occur on the parcel.*  
19

20  
21 **Comment:** The following comment adds clarity to the nature of recreational impacts to the  
22 Hell's Half Acre Wilderness Study Area (WSA).  
23

24 **[140-02, Wendy Reynolds, on behalf of the Bureau of Land Management, Upper Snake**  
25 **Field Office]** 2) While the BLM has commented on the reduction of the visual quality of the area  
26 as a result of the construction and operation of the facility (Boggs, 2010), the BLM would like to  
27 add clarity to the nature of recreational impacts as it concerns the Hell's Half Acre WSA. First,  
28 the camping area described in the DEIS is not within the WSA itself. The proposed facility would  
29 be seen from this area (particularly at night), however, so from a recreational standpoint a more  
30 appropriate impact analysis might read, for example, "The construction and operation of the  
31 proposed facility would reduce the quality of the recreational experience for campers at the  
32 Hell's Half Acre trailhead."  
33

34 **Response:** *The NRC appreciates the clarification and has modified the text accordingly in*  
35 *Section 4.2.3.2 of the EIS.*  
36  
37

38 **Comment:** The following comment relates to Bonneville County's appraisal of the quality of the  
39 farmland at the proposed EREF site and vicinity.  
40

41 **[152-05, Steven Serr]** Issues were brought up, which I don't remember in particular were  
42 addressed, as to the viability of the area out there as being a prime agricultural area. It is a  
43 desert that we're irrigating and farming. A good portion of this site is not farmed.  
44

45 Some of the facility will be on irrigated acreage. We have farms out on the west side that are  
46 shutting down, and reverting back to natural habitat. Issues of suitability for that agricultural use  
47 because of high-lift pumping and that. So we don't consider it to be an extreme prime  
48 agricultural area that far out. Closer in, lower depths, it would be more prime.  
49

1 **Response:** *It is acknowledged in Section 3.2.1 of the EIS that some prime farmland is found on*  
2 *the proposed EREF property. However, the proposed EREF is sited in an area with county*  
3 *zoning consistent with AES's intended operations. As discussed in Section 4.2.1, and as noted*  
4 *in the comment, this area is not considered a prime agricultural area.*  
5  
6

7 **Comment:** The following comments note the suitability of the location of the proposed EREF  
8 site, including with respect to Bonneville County's comprehensive plan and zoning rules and  
9 regulations.  
10

11 **[133-05, Richard Provencher]** The land where the facility is being located is baron with virtually  
12 no other viable use other than farming, however, there are thousands of acres in this area that  
13 are also not being used for farming.  
14

15 **[135-04, Hon. Dave Radford]** Being a political subdivision of the State of Idaho, Bonneville  
16 County adopted a comprehensive plan that included located nuclear growth west of -- on the  
17 western side of -- Bonneville County, so we think that will help expedite the process. We, as the  
18 commission, agree with the Environmental Impact Statement's conclusion.  
19

20 **[152-03, Steven Serr]** As far as compliance with zoning rules and regulations, that area was  
21 designed specifically for this type of facility. It's not designed to have other uses out there that  
22 could be impacted by those uses.  
23

24 **[152-09, Steven Serr]** I wanted to address the issue as to the suitability of this property for  
25 development of that site. Again, as the Commissioner mentioned earlier, this area has been  
26 zoned and designated for this type of use. It's been planned that it could accommodate this type  
27 of operation since 1960. So, it's been a long-designated piece of property, tract of land out there  
28 for this type of use.  
29

30 I approach this as an enforcement site for any facility that's built in the county. Our concern in  
31 the county is making sure that things are built to code, built complaint, built safe, protect public  
32 health, safety, and welfare. My office, we are responsible for enforcement of the building code,  
33 the fire code, mechanical code, flood plain rules and regulations, and we have addressed most  
34 of these issues with AREVA. We've made modifications for some of their design issues on what  
35 they contemplate doing to try to mitigate, and make sure that the operation that they're  
36 proposing out there will be a safe compliant operation.  
37

38 **Response:** *The NRC appreciates the confirmation of the information presented in Section 3.2.1*  
39 *that the zoning of the area where the proposed EREF is to be located is compatible with the*  
40 *intended use of the site.*  
41  
42

43 **Comment:** The following comments suggest that the Federal Farmland Protection Policy Act  
44 (FPPA) applies to this EIS and to the proposed EREF project.  
45

46 **[013-02, Kit Blackburn; 063-03, Martha Haga; 093-02, Louis Landry; 109-02, Eugene**  
47 **McVey; 120-07, Frank Nicholson; 121-02, Jennifer Nordstrom]** Additionally, the draft EIS  
48 may not be in compliance with the Federal Farmland Protection Act. The EIS claims that the

1 licensing of this facility is exempt from the Farmland Protection Act since the site is on private  
2 property (EIS, 3-3). But because Areva has accepted a \$2 billion federal loan guarantee from  
3 the Department of Energy, the Federal Farmland Protection Act applies to this license and the  
4 required procedures under the Act must be completed prior to licensing.  
5

6 **[015-21, Beatrice Brailsford; 088-09, Stan Kidwell; 122-05, Kathy O'Brien; 175-07,**  
7 **Ellen Thomas]** The NRC should address both Areva's failure to comply with the Federal  
8 Farmland Protection Act and its own failure to fully analyze the environmental effects of a large  
9 range fire at the Areva site.

10  
11 **[095-09, Linda Leeuwrik]** The NRC should address both Areva's failure to comply with the  
12 Federal Farmland Protection Act and its own failure to fully analyze the environmental effects of  
13 a large range fire at the Areva site.  
14

15 **[118-03, Caroline Morris]** The draft EIS also may not comply with the Federal Farmland  
16 Protection Act (Act), which applies because Areva has a \$2 billion federal loan guarantee from  
17 the Department of Energy. The EIS claim of being exempt from the Act because the EREF site  
18 is on private property is wrong. Areva's licensing must comply with the Act and its procedural  
19 requirements before licensing.  
20

21 **[127-02, Sheila Plowman]** Also, The NRC should address both Areva's failure to comply with  
22 the Federal Farmland Protection Act and its own failure to fully analyze the environmental  
23 effects of a large range fire at the Areva site.  
24

25 **[153-01, Andrea Shipley; 197-01, Andrea Shipley, on behalf of the Snake River Alliance]**  
26 Areva's proposed uranium enrichment factory will...utilize farmland that is potentially protected  
27 by the Federal government.  
28

29 **[153-12, Andrea Shipley; 184-17, Kitty Vincent]** Further, The EIS may not be in compliance  
30 with the Federal Farmland Protection Act. The EIS claims that the licensing of this facility is  
31 exempt from the Farmland Protection Act since the site is on private property (EIS, 3-3). But  
32 because Areva has accepted a \$2 billion federal loan guarantee from the Department of Energy,  
33 the Federal Farmland Protection Act applies to this license and the required procedures under  
34 the Act must be completed prior to licensing.  
35

36 **[184-07, Kitty Vincent]** Areva's proposed Eagle Rock Enrichment Facility (EREF)  
37 will...obliterate farmland that is potentially protected by the federal government.  
38

39 **[191-02, Liz Woodruff]** But I did want to provide further details on one aspect of the testimony  
40 that I gave in Idaho, and that has to do with the fact that the DEIS may not be in compliance  
41 with the Federal Farmland Protection Act. The EIS claims that the licensing of this facility is  
42 exempt from the Farmland Protection Act, since the site is on private property. To quote the  
43 Draft EIS, "Some of the land located within the proposed property was designated as prime  
44 farmland by the U.S. Natural Resource Conservation Service. This is a federal designation.  
45 Prime farmland is protected by the Federal Farmland Protection Policy Act. The intent of this act  
46 is to protect prime farmland from other uses as the result of federal actions." I'm still quoting  
47 from the EIS. "The act does not apply to federally permitted or licensed actions of private lands,

1 therefore, the act and its designation as prime farmland do not restrict land use on the proposed  
2 EREF property.” And this is from EIS 3-3.

3  
4 So, from information the Alliance gathered from the Idaho State USDS we confirmed that  
5 because AREVA has accepted a \$2 billion federal loan guarantee, and this is a form of financial  
6 insurance from the federal government with your taxpayer dollars, AREVA has even been  
7 quoted as saying without access to this cheap capital, they would not build this facility in the  
8 U.S., so this is clearly a form of financing. That the Federal Farmland Protection Act absolutely  
9 applies to this license, and when the NRC consulted with the USDA in Idaho, they did not share  
10 the information with that agency that there would be a loan guarantee. Perhaps it was not  
11 known at that time, but it is known now.

12  
13 Specifically, from 7 CFR, Section 258.2, “Federal program means those activities are  
14 responsibilities of a federal agency that involve undertaking financing or assisting construction,  
15 or improvements projects, or acquiring, managing, or disposing of the federal lands and  
16 facilities.” So, simply put, this loan guarantee changes the game. And this isn’t a claim that you  
17 can’t license the facility, this is a claim that you absolutely must go through the processes that  
18 fall under the Federal Farmland Protection Act. It would be unacceptable to do otherwise.

19  
20 **[191-20, Liz Woodruff]** • The EIS may not be in compliance with the Federal Farmland  
21 Protection Act. The EIS claims that the licensing of this facility is exempt from the Farmland  
22 Protection Act since the site is on private property. To quote the draft EIS:

23  
24 “Some of the land located within the proposed property was designated as prime farmland by  
25 the U.S. Natural Resources Conservation Service (NRCS). Prime farmland is protected by the  
26 Federal Farmland Protection Policy Act (see Title 7 of the U.S. Code of Federal Regulations  
27 (7 CFR 658.2). Per 7 CFR 658.2 (c)(1)(i), the intent of this Act is to protect prime farmland from  
28 other uses as the result of Federal actions. The Act does not apply to Federally permitted or  
29 licensed actions on private lands. Therefore, the Act and its designation as prime farmland do  
30 not restrict land use on the proposed EREF property” (EIS, 3-3).

31  
32 From information gathered from the Idaho State USDA, I’ve confirmed that because Areva has  
33 accepted a \$2 billion federal loan guarantee from the Department of Energy, the Federal  
34 Farmland Protection Act likely applies to this license and the required procedures under the Act  
35 must be completed prior to licensing. From 7 CFR Section 258.2 (c):

36  
37 “Federal program means those activities or responsibilities of a Federal agency that involve  
38 undertaking, financing, or assisting construction or improvement projects or acquiring,  
39 managing, or disposing of Federal lands and facilities.”

40  
41 **[193-21, Liz Woodruff, on behalf of the Snake River Alliance]** My next point is that this  
42 Environmental Impact Statement and the proposed licensing is potentially in violation of the  
43 Farmland Protection Act. The EIS claims that this facility is exempt from the Farmland  
44 Protection Act since the site is on private property.

45  
46 So a red flag went off for me when I read this in the EIS, and so I called the relevant agencies,  
47 federally, and in the state, and I was told that because AREVA accepted a \$2 billion federal loan



1 guarantee from the Department of Energy, the Farmland Protection Act applies, because it's a  
2 federally-funded project.

3  
4 The NRC must go back, review this section of the EIS, talk to the relevant agencies, discuss the  
5 issues around this huge Department of Energy loan, and go through the process and  
6 procedures necessary to determine that you're in compliance with the Farmland Protection Act.  
7 This is on Prime A age farmland that they're proposing for this facility.

8  
9 **[197-12, Andrea Shipley, on behalf of the Snake River Alliance]** Further, the EIS may not  
10 be in compliance with the Federal Farmland Protection Act.

11  
12 **Response:** *The FPPA is discussed in Section 3.2.1 of the EIS. As stated in the Draft EIS, it is*  
13 *correct that the FPPA does not apply to Federally permitted or licensed actions on private lands*  
14 *(including the potential licensing by the NRC of the proposed EREF) (7 CFR 658.2 (c)(1)(i)).*  
15 *However, the text of Section 3.2.1 has been modified to acknowledge that the DOE, in issuing a*  
16 *Federal loan guarantee to AES, is required by the FPPA to assess the project's effect on the*  
17 *prime farmland that would be converted on the proposed EREF site.*

#### 20 **I.5.9 Historic and Cultural Resources**

21  
22 **Comment:** The following comment asks the NRC to incorporate design features in the  
23 proposed EREF project to minimize impacts to cultural resources and to prepare a plan to  
24 mitigate for impacts that cannot be avoided or minimized.

25  
26 **[027-22, Sara Cohn]** *Avoid, Minimize, Mitigate:* In terms of priorities, the NRC should first site  
27 facilities and infrastructure to avoid impacts to wildlife and cultural resources. If impacts cannot  
28 be entirely avoided, the NRC should incorporate design features to minimize impacts. Lastly, a  
29 plan should be prepared to mitigate for impacts that cannot be avoided or minimized.

30  
31 **Response:** *The siting of a uranium enrichment facility involves a number of requirements, as*  
32 *discussed in Section 2.3.1 of the EIS. Environmental protection and land use/demography were*  
33 *two of the criteria categories used. Mitigation measures identified by AES to minimize impacts*  
34 *to cultural resources during preconstruction, construction, and operation of the proposed EREF*  
35 *are presented in Section 4.2.2.3 and Chapter 5. Further, procedures to address unexpected*  
36 *discoveries in the case of cultural resources have been put in place, as mentioned in*  
37 *Section 4.2.2.3.*

38  
39 *The NRC's action with regard to the proposed EREF project is limited to granting a license, if*  
40 *found to be warranted, for the construction, operation, and decommissioning of the proposed*  
41 *facility. NRC is not the implementer or funding entity for the proposed activity. As a result, NRC*  
42 *generally limits its analysis to the alternatives and actions reasonably available to the applicant.*

43  
44 *When NRC reviews a proposed action, its ability to impose additional requirements and*  
45 *environmental mitigation and monitoring measures beyond those proposed as part of the*  
46 *license application is limited to those with a reasonable nexus to providing protection for*  
47 *radiological health and safety and common defense and security. The NRC can, however,*  
48 *require that the proposed facility be built in accordance with the submitted application, including*  
49 *mitigation and monitoring measures proposed by the applicant that are not specifically required*

1 *by or directly related to NRC's regulations. Thus, the NRC does have the ability to hold*  
2 *licensees to key mitigation and monitoring measures committed to in their applications and*  
3 *subsequently incorporated in the NRC license directly or by reference.*  
4

5  
6 **Comment:** The following comment states that mitigation of impacts to aboriginal and ceded  
7 areas, and to water, soil, plants, animals and air, need to be addressed in the EIS.

8  
9 **[036-06, Christina Cutler, on behalf of the Shoshone-Bannock Tribes]** Mitigation of impacts  
10 to aboriginal and ceded areas needs to be addressed. Mitigation issues regarding  
11 environmental impacts to water, soil, plants, animals and air.

12  
13 **Response:** *Mitigation measures identified by AES to minimize impacts during preconstruction,*  
14 *construction, and operation of the proposed EREF are presented in Section 4.2 and Chapter 5*  
15 *of the EIS for all resource areas as applicable. Further, procedures to address unexpected*  
16 *discoveries in the case of cultural resources have been put in place, as mentioned in*  
17 *Section 4.2.2.3.*

18  
19 **Comment:** The following comment suggests that mitigation for all culturally sensitive items  
20 needs to be done.

21  
22 **[036-08, Christina Cutler, on behalf of the Shoshone-Bannock Tribes]** Mitigation for all  
23 culturally sensitive items needs to be done. It is my understanding that since AREVA is required  
24 to follow the NEPA process we can request mitigation for all of our concerns.

25  
26 **Response:** *All known impacts on historic and cultural resources, as discussed in Section 4.2 of*  
27 *the EIS, will be mitigated by AES.*

28  
29  
30 **Comment:** The following comment relates to a Memorandum of Agreement between the Idaho  
31 State Historic Preservation Office (SHPO) and the NRC to resolve the effects on site MW004.

32  
33 **[126-01, Susan Pengilly, on behalf of the Idaho State Historic Preservation Office]** Our  
34 only recommendation is to add a statement saying that effects on site MW004 will be resolved  
35 through a Memorandum of Agreement (MOA) between the NRC and the Idaho SHPO  
36 (assuming that the Advisory Council on Historic Preservation does not want to be a signatory).  
37 This statement should be added somewhere in Section 4.2.2, perhaps in the paragraphs  
38 bounded by lines 13-24.

39  
40 Also, please be aware that the MOA needs to be signed *before* the ROD is issued to ensure  
41 compliance with Section 106. This has been a problem in the past with other Federal projects,  
42 and the Advisory Council has made it very clear that the MOA needs to be finalized before  
43 issuance of the ROD.

44  
45 **Response:** *The most recent information of the consultations between the NRC, SHPO, and*  
46 *Federally recognized Shoshone-Bannock Tribes concerning impacts on historic and cultural*  
47 *resources has been added to Section 4.2.2.1 of the EIS.*  
48  
49

1 **Comment:** The following comment requests notification of the Heritage Tribal Officer of the  
2 Shoshone-Bannock Tribes of any inadvertent cultural or archaeological discoveries, and training  
3 of EREF site workers in cultural resources regulations and laws.  
4

5 **[129-03, Willie Preacher, on behalf of the Shoshone-Bannock Tribes]** Regarding cultural  
6 issues the tribes would like to have the Heritage Tribal Office (HeTO) to be a part of the cultural  
7 surveys of this proposed site and to be notified of any inadvertent cultural or archaeological  
8 discoveries. Also inform the contractors who may be utilized for the construction of the facility  
9 and for the permanent employees of the cultural regulations and federal laws concerning  
10 artifacts, retrieving and removing historic items, The INL who is a neighbor to this proposed site  
11 has experienced decades of this type of behavior.  
12

13 **Response:** *An inadvertent (unanticipated) discovery plan has been developed by AES for the*  
14 *proposed EREF project and is discussed in Section 4.2.2.1 of the EIS. Pre-project training of*  
15 *workers in cultural resources legislation and rules is identified as a mitigation measure in*  
16 *Section 4.2.2.3 and Chapter 5 of the EIS.*  
17  
18

19 **Comment:** The following comment states that the Final EIS should discuss both (1) how issues  
20 raised by tribes would be addressed by the project and (2) the outcomes of ongoing work with  
21 the Idaho SHPO and affected tribes on potential effects requiring Section 106 review of the  
22 *National Historic Preservation Act.*  
23

24 **[138-08, Christine Reichgott, on behalf of the U.S. Environmental Protection Agency,**  
25 **Region 10]** Consultation with Tribal Governments - The draft EIS indicates that there have  
26 been contacts with Tribes that may be affected by the proposed project. This is especially  
27 important because the DEIS states that the project would result in up to large impacts to  
28 resources important to tribes (p. 4-4), including historical and cultural, visual, and ecological  
29 resources. Construction activities, for example, would destroy historic and cultural resources at  
30 MW004 site, while increased traffic and construction activities and the presence of an industrial  
31 complex would significantly alter the visual landscape. Because of these and other impacts that  
32 may be discovered during the project operations, we recommend that the final EIS include a  
33 discussion of how issues raised by Tribes would be addressed by the project and outcomes of  
34 the ongoing work with the Idaho State Historic Preservation Office and affected Tribes on  
35 potential effects requiring Section 106 review of the National Historic Preservation Act.  
36

37 **Response:** *Consultation with the SHPO and the affected Federally recognized Shoshone-*  
38 *Bannock Tribes has been ongoing throughout the EIS process. The information on the status of*  
39 *these consultations in Sections 1.5.4.2 and 4.2.2 of the EIS has been updated. An updated*  
40 *discussion of the impacts on specific cultural resources is also presented in Section 4.2.2.*  
41  
42

43 **Comment:** The following comments were expressed over the destruction of the John Leopard  
44 Homestead (site MW004).  
45

46 **[135-04, Hon. Dave Radford]** Historically, I serve on the Heritage Commission. I think history is  
47 important, that homestead, I think, could be mitigated out there. Historically, Bonneville County,  
48 my predecessors at the County Commission, took very limited resources in terms of property

1 tax dollars and invested them in improved roads to get out to the site 60 years ago. So,  
2 historically, we've been a nuclear-friendly county, and I believe that it will continue. And we  
3 applaud your work, we respect your work, and we hope for a great outcome for an expedited  
4 license for AREVA.

5  
6 **[147-15, Joey Schueler]** 11. A historical landmark and a vast expanse of Idaho native habitat  
7 will be destroyed to build this plant.

8  
9 **[153-01, Andrea Shipley; 197-01, Andrea Shipley, on behalf of the Snake River Alliance;  
10 184-07, Kitty Vincent]** Areva's proposed uranium enrichment factory will...support destruction  
11 of the John Leopard homestead which has been recommended for the National Register of  
12 Historic Places

13  
14 **[191-23, Liz Woodruff]** Construction of the facility would lead to the destruction of a site that  
15 has been recommended for the National Register of Historic Places. The John Leopard  
16 homestead (MW004), would be destroyed in preconstruction activity. A Memorandum of  
17 Understanding must be signed with the Idaho State Historic Preservation Office before any  
18 activity is initiated that would affect this historic site.

19  
20 **[193-24, Liz Woodruff, on behalf of the Snake River Alliance]** Areva's proposed Eagle Rock  
21 enrichment facility will...impair a national monument in Idaho, and support destruction of a  
22 historic site....

23  
24 **Response:** *Impacts on historic and cultural resources are discussed in Section 4.2.2 of the EIS.  
25 The NRC has been involved in consultation with the Idaho SHPO concerning the impacts on  
26 the John Leopard Homestead (site MW004) throughout the EIS process. The discussion of the  
27 consultation and mitigation efforts in Section 4.2.2 has been updated.*

28  
29 *AES archaeological consultant, Western Cultural Resource Management, Inc. (WCRM),  
30 conducted professional excavation and data recovery as mitigation site MW004 in October–  
31 November 2010 following the process identified in a Treatment Plan previously reviewed by the  
32 Idaho SHPO (Idaho SHPO, 2010). WCRM submitted a summary report on these data recovery  
33 efforts to the Idaho SHPO on November 17, 2010 (WCRM, 2010). In a letter dated  
34 November 26, 2010, the SHPO stated that the data recovery report had been reviewed and  
35 accepted (Idaho SHPO, 2010). A detailed report on the site MW004 mitigation is being  
36 prepared by AES.*

### 37 38 39 **I.5.10 Visual and Scenic Resources**

40  
41 **Comment:** The following comment states that the Final EIS should include a discussion of how  
42 issues such as visual impacts raised by tribes would be addressed by the project.

43  
44 **[138-08, Christine Reichgott, on behalf of the U.S. Environmental Protection Agency,  
45 Region 10]** Consultation with Tribal Governments - The draft EIS indicates that there have  
46 been contacts with Tribes that may be affected by the proposed project. This is especially  
47 important because the DEIS states that the project would result in up to large impacts to  
48 resources important to tribes (p. 4-4), including historical and cultural, visual, and ecological

1 resources. Construction activities, for example, would destroy historic and cultural resources at  
2 MW004 site, while increased traffic and construction activities and the presence of an industrial  
3 complex would significantly alter the visual landscape. Because of these and other impacts that  
4 may be discovered during the project operations, we recommend that the final EIS include a  
5 discussion of how issues raised by Tribes would be addressed by the project and outcomes of  
6 the ongoing work with the Idaho State Historic Preservation Office and affected Tribes on  
7 potential effects requiring Section 106 review of the National Historic Preservation Act.  
8

9 **Response:** *Consultation with the SHPO and the affected Federally recognized Shoshone-*  
10 *Bannock Tribes has been ongoing throughout the EIS process. The visual impacts associated*  
11 *with the project are discussed in Section 4.2.3 of the EIS.*  
12

13  
14 **Comment:** The following comment relates to mitigation measures for visual impacts from the  
15 proposed EREF.  
16

17 **[152-13, Steven Serr]** There was discussion as far as potential moderate impact on the facility  
18 that it could create a visual impact on site. One of the very early things we discussed with  
19 AREVA when they looked at the site was the potential for location on the site to keep it back  
20 from visual appearances to the public, and also discussing what landscaping features might be  
21 incorporated into it to even buffer it, to mitigate any visual impacts. We discussed lighting  
22 issues, treescape, approach roads, and we feel that before this project would fully be built, that  
23 we would have some approved mitigation plans to help eliminate any of those visual impacts, so  
24 we could take that down from a moderate impact to a slight impact.  
25

26 **Response:** *The NRC recognizes the ongoing consultations between AES and Bonneville*  
27 *County regarding the construction and operation of the proposed EREF. Visual impact*  
28 *mitigation measures that AES has identified are presented in Section 4.2.3.3 and Chapter 5 of*  
29 *the EIS.*  
30

31  
32 **Comment:** The following comment relates to impacts on the wilderness values of Hell's Half  
33 Acre WSA due to construction and operation of the proposed EREF.  
34

35 **[140-03, Wendy Reynolds, on behalf of the Bureau of Land Management, Upper Snake**  
36 **Field Office]** Second, Mr. Boggs indicates that the proposed facilities would be seen from  
37 certain areas of the Hell's Half Acre WSA (particularly from the northern end of the hiking trail).  
38 Because these areas are within the WSA itself, there would be adverse impact on wilderness  
39 values associated with the implementation of the proposed action. The analysis in this case  
40 could read, for instance, "The construction and operation of the proposed facility would have an  
41 adverse impact on wilderness values because opportunities for solitude would be reduced due  
42 to the facility being within sight of users of certain areas of the WSA. The impact would be  
43 greatest at night when artificial lighting is in use". The BLM agrees with the characterization of  
44 these impacts as MODERATE.  
45

46 **Response:** *The NRC appreciates the clarification and has modified the text of Section 4.2.3.2*  
47 *of the EIS accordingly.*  
48  
49



1 **Comment:** The following comments relate to the impacts of light pollution on Hell's Half Acre  
2 WSA.

3  
4 **[067-01, Mike Hart]** With respect to what I view as the public's best interest, first, I thank you  
5 for the analysis. Looking through the EIS, Section 4.2.3, you analyze visual impacts which  
6 include light pollution. As an astronomer, we use the area, Hell's Half Acre, for astronomy  
7 parties. We use that because it's a good dark sky location that's relatively convenient. The EIS  
8 doesn't specifically mention that, but in mitigation, it does identify that there will be low – or the  
9 lights will be pointed downwards, and I would appreciate further mitigations to acknowledge that  
10 the sky should be kept as dark as possible. Possibly for security, if you could use infrared  
11 technology or something that doesn't require high light levels that would very much be  
12 appreciated.

13  
14 **[067-08, Mike Hart]** With respect to environmental impacts, I'd like to thank the NRC for  
15 listening to my scoping comments about light pollution. This facility is located near 20 Mile Rock,  
16 as we call it, or the lava hiking trail. We use that for star parties. If you go out tonight, it's the  
17 Perseid Meteor Shower peak. This would be a great time to visit a dark sky 20 miles from town.  
18 You can get away from the city lights. I hope this facility continues to be pursued, but with the  
19 idea of keeping those lights to a minimum and keep that dark sky, preserve that resource.

20  
21 **Response:** *AES has stated that light noise will be minimized to the extent practicable and that*  
22 *all perimeter lights would be downfacing (AES, 2010a), as discussed in Section 4.2.3.3 and*  
23 *Chapter 5 of the EIS.*

24  
25  
26 **Comment:** The following comments noted that the proposed EREF could have impacts to Hell's  
27 Half Acre WSA.

28  
29 **[153-01, Andrea Shipley]** Areva's proposed uranium enrichment factory will...impact the Hell's  
30 Half Acre National Monument

31  
32 **[184-07, Kitty Vincent]** Areva's proposed Eagle Rock Enrichment Facility (EREF) will...impair  
33 the Hell's Half Acre National Monument

34  
35 **[191-32, Liz Woodruff]** Visual and scenic resources. The proposed facility will have a visual  
36 impact on the Hell's Half Acre National Monument.

37  
38 **[193-24, Liz Woodruff, on behalf of the Snake River Alliance]** AREVA's proposed Eagle  
39 Rock enrichment facility will...impair a national monument in Idaho....

40  
41 **Response:** *Visual impacts on Hell's Half Acre WSA from the construction and operation of the*  
42 *proposed EREF are discussed in Section 4.2.3 of the EIS. AES has identified a number of*  
43 *measures to mitigate these impacts, as presented in Section 4.2.3.2 and Chapter 5 of the EIS.*

1 **I.5.11 Air Quality**  
2

3 **Comment:** The following comment expresses concern about the potential release from the  
4 proposed EREF of radioactive, hazardous, and toxic materials into the air.  
5

6 **[027-13, Sara Cohn]** The ICL is very concerned about the potential release of radioactive,  
7 hazardous and toxic materials into the air. Potential air releases associated with operation of  
8 this facility should be further analyzed, reported, and permitted though Idaho's Department of  
9 Environmental Quality.  
10

11 **Response:** *Potential emissions of criteria pollutants and hazardous air pollutants during facility*  
12 *operation are analyzed in Section 4.2.4.2 of the EIS. Potential radiological releases during*  
13 *facility operation are analyzed in Section 4.2.10.2. The license that would be issued to AES by*  
14 *NRC, if granted, would not exempt AES from its obligation to comply with other applicable*  
15 *Federal, State, and local regulations or requirements, as noted in Section 1.5 of the EIS. Under*  
16 *Idaho State regulations, AES would have to satisfy all air quality regulatory and permitting*  
17 *requirements that may be enforced by the IDEQ.*  
18  
19

20 **Comment:** The following comment deals with mitigation of air pollution resulting from  
21 construction of the proposed EREF.  
22

23 **[027-17, Sara Cohn]** Air pollution resulting from construction of the proposed facility should be  
24 avoided or reduced using the best available management practices and control technology. To  
25 preserve Idaho's clean air during construction operations, the NRC should include mitigation  
26 measures for these pollutants. For example, fugitive dust emissions can be controlled through  
27 the use of water trucks, provided the Storm Water Pollution Prevention Program (SWPPP)  
28 ensures no discharge of sediment from the site. Additionally, diesel emissions should be  
29 reduced using best management practices for construction including limited idling of diesel  
30 equipment and the use of low-emitting fuels and low-emitting technology for construction  
31 equipment.  
32

33 **Response:** *Mitigation measures for control of air pollutants during preconstruction and*  
34 *construction of the proposed EREF have been identified by AES, and are presented in*  
35 *Section 4.2.4.3 and Chapter 5 in the EIS. Further, IDEQ has the authority to require AES to*  
36 *control fugitive dust emissions throughout the preconstruction and construction phases.*  
37  
38

39 **Comment:** The following comment requests that AES/NRC re-evaluate the need for an air  
40 permit to construct using uncontrolled emission rates of toxic air pollutants.  
41

42 **[066-24, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 22.  
43 Chapter 1: pp 1-17, Table 1-2. This table summarizes that an air quality permit to construct is  
44 not required for this project because the exemption criteria of IDAPA are satisfied. Toxic air  
45 pollutant emissions are discussed on pages 4-24 through 4-27. In these pages it is concluded  
46 that emissions of fluoride, ethanol, methylene chloride, and uranium from normal operations  
47 meet the exemption criteria for toxic air pollutants in IDAPA 58.01.01 Section 223. In order to  
48 meet the Section 223 exemption criteria for toxic air pollutants, uncontrolled emissions must

1 meet the exemption criteria as opposed to emissions from “normal” operations as discussed in  
2 the Draft EIS.

3  
4 In accordance with IDAPA 58.01.01 Section 210 an uncontrolled emissions rate of a toxic air  
5 pollutant from a source or modification is calculated using the maximum capacity of the source  
6 or modification under its physical and operational design without the effect of any physical or  
7 operational limitations. Examples of physical and operational design include but are not limited  
8 to: the amount of time equipment operates during batch operations and the quantity of raw  
9 materials utilized in a batch process. Examples of physical or operational limitations include but  
10 are not limited to: shortened hours of operation, use of control equipment, and restrictions on  
11 production which are less than design capacity. It is not clear from the information provided in  
12 the draft EIS whether uncontrolled emissions of fluoride, ethanol, methylene chloride, and  
13 uranium were compared to the exemption thresholds, but the use of the term “normal  
14 emissions” on page 4-27, line 37 does imply that air pollution mitigation measures were  
15 inappropriately considered in the toxic air pollutant exemption determination. DEQ requests that  
16 AES/NRC reevaluate the need for an air permit using uncontrolled emission rates of toxic air  
17 pollutants.

18  
19 **Response:** *The NRC staff based its analysis of air releases on operational data and*  
20 *experiences provided by AES for other AES facilities using similar enrichment technology and*  
21 *controls. This information from AES was reviewed and independently verified by the NRC staff*  
22 *before using it in the EIS. To ensure the most conservative estimate possible, the NRC staff*  
23 *constrained the releases of the subject materials to the shortest reasonable time frame, given*  
24 *the nature of the activity resulting in a release. For example, methylene chloride is used for*  
25 *equipment refurbishment, but that activity takes place only during the first shift. Consequently,*  
26 *that time frame is reflected in the NRC’s estimate of the rate of methylene chloride release. In*  
27 *the case of methylene chloride release, the NRC understands that this does represent an*  
28 *uncontrolled release because it is the result of evaporative losses from benchtop operations*  
29 *where methylene chloride vapors are subsequently vented to the atmosphere without passing*  
30 *through any control devices. Although the NRC believes that its application of the IDEQ*  
31 *regulations in the EIS is reasonable and conservative, the determination of whether the scenario*  
32 *described meets the permit exemptions contained in IDEQ rules is solely the province of IDEQ;*  
33 *and AES will be dealing directly, and the NRC will not be involved, with IDEQ with regard to air*  
34 *permitting for construction and operation of the proposed facility.*

35  
36 *The NRC’s use of the term “normal emissions” is meant to describe a condition where all*  
37 *systems are operating as designed (i.e., no upset or off-normal conditions exist) and pollution*  
38 *control devices are operating in accordance with their performance guarantees.*

39  
40  
41 **Comment:** The following comment asserts that there is a contradiction in statements in the EIS  
42 regarding exceedances of ambient air quality standards for particulate matter during  
43 preconstruction and construction of the proposed EREF.

44  
45 **[066-25, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 23.  
46 Chapter 4: pp 4-20, Table 4-5. This table shows that the National Ambient Air Quality Standards  
47 will be exceeded for particulate matter during preconstruction and construction. Mitigation  
48 measures are discussed in Section 4.2.4.3, pp-4-28. The opening paragraph of this section

1 states, "Impacts from the release of criteria pollutants from the operation of vehicles and  
2 equipment during preconstruction, construction, and operation are not expected to result in  
3 exceedances of ambient air quality standards..." This statement contradicts with the estimated  
4 ambient impacts presented in Table 4-5 (which shows violations of the particulate matter  
5 standards). It appears that the predicted ambient impacts shown in Table 4-5 should be updated  
6 to reflect the ambient impacts that would occur when operating using the listed mitigation  
7 measures which are expected to result in lower emissions that do not cause an exceedance.  
8

9 **Response:** *To clarify, the EIS language quoted in the comment was included to emphasize that  
10 exceedance of the particulate standard would result primarily from fugitive dust generation and  
11 not from operation of reciprocating internal combustion engines (RICE). The estimated ambient  
12 air impacts in Table 4-5 in the EIS include contributions from all sources of criteria pollutants.  
13 The opening paragraph in Section 4.2.4.3 was revised to make that distinction. In this case,  
14 mitigations of fugitive dust would be more valuable than efforts to minimize emissions from  
15 RICE.*  
16

17 *Data in Table 4-5 resulted from application of the appropriate U.S. Environmental Protection  
18 Agency (EPA) AERMOD dispersion models. The mitigation measures identified by AES and  
19 presented in the EIS can be expected to result in reduced emissions of criteria pollutants.  
20 However, since a final mitigation strategy is not available, the suggested updated emission  
21 reduction calculation cannot be completed at this time.*  
22  
23

24 **Comment:** The following comment expresses agreement with the Draft EIS that any potential  
25 negative impacts on the air and water resources would be SMALL.  
26

27 **[102-02, R.D. Maynard]** After reviewing the summary of the environmental consequences and  
28 mitigation section of the draft EIS, I'm confident that any potential negative impact on the air and  
29 water resources would be small.  
30

31 **Response:** *The NRC staff acknowledges this comment and appreciates the participation.*  
32  
33

34 **Comment:** The following comment recommends that the NRC maximize implementation of the  
35 air pollution mitigation measures described in the EIS and coordinate with the IDEQ throughout  
36 the project lifespan to assure that federal and state air quality standards will be met by the  
37 proposed project.  
38

39 **[138-02, Christine Reichgott, on behalf of the U.S. Environmental Protection Agency,  
40 Region 10]** For better protection of public health from air pollution exposure, EPA has set  
41 National Ambient Air Quality Standards (NAAQS) for six principal pollutants or criteria pollutants  
42 (see <http://www.epa.gov/air/criteria.html>) that should be used to determine if emissions from a  
43 project would exceed daily and annual standards. Any projects that would generate emissions  
44 exceeding the standards would have to include measures to demonstrate that, if implemented,  
45 the project would comply with both state and federal air quality regulations. Even though  
46 background concentrations of criteria pollutants within the project area and environs are  
47 currently below the standards, it is likely that emissions within the project area could exceed the  
48 standards because of the proposed project. As the DEIS noted, particulate matter (PM)

1 concentrations during construction activities would be moderate to large (p. 4-1 1) due to  
2 fugitive dust releases to the air during ground disturbing activities even after application of  
3 mitigation measures, although they would be temporary and brief in duration. The DEIS  
4 indicates that air emissions associated with the ERF preconstruction and construction activities  
5 alone would be 271.5% and 105% higher than NAAQS for 24-hour PM10 and PM2.5  
6 concentrations, respectively (p. 4-20). Because of these anticipated exceedances of ambient air  
7 quality standards, we recommend that NRC maximize implementation of the mitigation  
8 measures described in the DEIS and coordinate with the Idaho Department of Environmental  
9 Quality (IDEQ) throughout the project lifespan to assure that federal and state air quality  
10 standards will be met by the project.

11  
12 **Response:** *The NRC staff concurs with EPA’s assessment that a properly designed and*  
13 *executed mitigation plan will be essential for preserving ambient air quality during certain*  
14 *phases of facility construction and agrees that collaboration with IDEQ is the best way to ensure*  
15 *that adequate controls will be included in IDEQ permits.*

16  
17 *The NRC’s purpose and need statements in its environmental review documents reflect that*  
18 *NRC is not the implementer or funding entity for the proposed activity. As a result, when the*  
19 *NRC reviews a proposed action, its ability to impose additional requirements and mitigative*  
20 *measures beyond those proposed as part of the application is limited to those with a reasonable*  
21 *nexus to providing protection for radiological health and safety and common defense and*  
22 *security. The NRC can, however, require that the facility be built in accordance with the*  
23 *submitted application, including mitigation measures proposed by the applicant that are not*  
24 *specifically required by or directly related to the NRC’s regulations. Thus, the NRC does have*  
25 *the ability to hold licensees to key mitigation measures committed to in their applications and*  
26 *subsequently incorporated in the NRC license directly or by reference.*

27  
28  
29 **Comment:** The following comments express the belief that fugitive dust generation during  
30 construction would not be a LARGE impact.

31  
32 **[094-02, Michael Lange]** There are very few disagreements I would have. Only, I guess the  
33 one I could say would be the dust mitigation issue more than likely can be mitigated down to a  
34 moderate level. And I believe that we do that out at IWTU everyday now, so I think that’s pretty  
35 accurate. The rest of it looks very professionally done.

36  
37 **[098-08, Linda Martin]** In the NRC assessment, the only topic which was described as small to  
38 large concerns the subject of Air Quality. In this geographic region local, state, and regional  
39 governments, agricultural interests, and private landowners frequently encounter dust or  
40 “fugitive” dust when working on projects concerning the land. Therefore, these impacts would be  
41 and should be considered to be normal, temporary, and brief in duration.

42  
43 **[152-14, Steven Serr]** The dust issue was one of the other issues in the EIS that was mentioned,  
44 that it would be a potential moderate impact. We do have a fairly aggressive plan for onsite  
45 maintenance of water application to construction sites to mitigate any dust out from it. I feel that  
46 given what we have encouraged developers to do on site during construction, that that could also  
47 be minimized down to a small impact, as opposed to a moderate impact.

48



1 **Response:** *The NRC staff acknowledges these comments and appreciates the participation.*  
2 *However, the NRC staff stands by its determination that fugitive dust generation would result in a*  
3 *LARGE impact, for reasons discussed in Section 4.2.4.1 of the EIS.*

#### 4 5 **I.5.12 Geology, Minerals, and Soil**

6  
7 **Comment:** The following comments are related to the seismic hazards to the proposed EREF.

8  
9 **[014-01, William Blair]** Idaho does not need more radioactive waste placed over the Snake  
10 Plain Aquifer in an active earthquake area. Until a safe method of handling and storing  
11 radioactive wastes for thousands of years is devised, NO new facilities should be approved.

12  
13 **[016-01, Manley Briggs]** I think that the seismic activity in the area around the plant needs to  
14 be considered. I understand that that was addressed and it was felt to not be significant. But  
15 Idaho is very seismically active. It has the fifth largest number of earthquakes in the country.  
16 The most recent earthquake was August 1st, 2010. It has had the two largest earthquake in the  
17 lower United States in the last 50 years. The Hebo Lake earthquake on the Idaho-Montana  
18 border was a 7.5 magnitude, and the Borah Peak earthquake, in 1983, was a 7.3 magnitude.  
19 And if this material is being stored in an area close to those potential earthquakes, I feel that  
20 that has to be addressed. There are fault lines that essentially completely surround the INL,  
21 comes down from the Lost River, comes down from the north, and I think that certainly needs to  
22 be addressed from the health point of view, because an earthquake could certain disrupt  
23 storage.

24  
25 **[0163-03, Manley Briggs]** Accordingly, I am concerned about the development of Areva's  
26 Eagle Rock Enrichment Facility, where depleted uranium hexafluoride will be stored over the  
27 aquifer. One of my concerns is that the INL is located in a seismically active area, and in  
28 addition of numerous other natural and manmade accidents that could compromise the safety of  
29 the stored material, an earthquake could pose a serious hazard.

30  
31 As you are probably aware, Idaho is very active seismically, and has the fifth highest  
32 earthquake activity in the nation. In addition, Idaho has experienced the two largest earthquakes  
33 in the contiguous United States in the last fifty years – the 1959 Hebgen Lake Earthquake  
34 (M7.5) and the Borah Peak earthquake (M7.3) in 1983. Both of these quakes occurred in  
35 locations close to EREF. I have enclosed maps showing the close proximity of fault lines to the  
36 INL. The Areva EIS needs to address this danger.

37  
38 **[100-03, Wendy Matson]** Due to the indefinite storage of depleted uranium hexafluoride on  
39 site, seismic activity in the area of the proposed facility poses a major safety hazard that could  
40 lead to a critical level accident. And I wish that the NRC could clarify why a complete analysis of  
41 this risk is delayed until the safety evaluation report.

42  
43 **[150-04, Katie Seevers]** NRC should clarify why a complete analysis of seismic risk is delayed  
44 until the safety evaluation report.

45  
46 **[152-06, Steven Serr]** The issues they had, that were addressed, as to seismic protection, life,  
47 safety, protection from earthquake damage. This area is in a seismic zone C on the building code  
48 map, cause it's not an extreme risk area for seismic activity. The INL is in the same seismic zone

1 designation. We have multiple nuclear facilities that have been constructed, nuclear reactors that  
2 have been built there have been safely functional during the seismic events we have experienced  
3 in the past, with no negative impacts on it. We have discussed the seismic issues with AREVA, and  
4 NRC staff, it was in my office, and felt that with compliance with the building code requirements that  
5 we have, that we fully intend to implement, that we don't see that there would be an issue with--  
6 issues of seismic, inappropriateness for this site to be built.

7  
8 **[152-11, Steven Serr]** Discussion regarding the seismic area out there, we have talked about  
9 seismic conditions, what the facility will need to be doing to meet safety issues as far as seismic  
10 design criteria. The safety issue of long-term storage was addressed, also, as to the containers  
11 that will be stored on site. The containers that they have on site, just to check and see, they're  
12 designed for transportation containers. They're able to survive an auto wreck, impact damage in  
13 an auto accident. Seismic conditions on site, worst case we'd have where there are outside  
14 storage, if something would fall over, be a low impact on it. We determined that that would not be a  
15 problem, as far as damage creating an issue in a seismic event that there could be any potential  
16 leakage.

17  
18 **[169-05, Margaret Stewart]** And, finally, I need to know why a complete analysis of the seismic  
19 risks of this facility is being delayed until the safety evaluation report. As you all know, this area has  
20 always been seismically active, and the production, transportation, and storage of such  
21 dangerously radioactive materials in such a volatile region seems irresponsible, at best.

22  
23 Now, I've used these signs before at hearings, and I use them again because geology doesn't  
24 change that much. Back in -- before 1982, the U.S. Building Code upon which all buildings in  
25 the U.S. must adhere to, and follow their codes, shows that this is the State of Idaho. Here's  
26 INEL, as it was called back then, and this is a zone three potential for major damage. Just after  
27 this date, INEL was looking to get approval from the U.S. Congress to build a nuclear facility, a  
28 very, very -- I won't go into that -- but a very specific nuclear facility with lots of inherent  
29 dangers, and it needed approval from Congress. And, uniquely, after 1992, the potential for  
30 major damage changed. And INEL is here completely outside of the danger zone. And now we  
31 go to 1989, and here is the potential for major damage with the yellow, and the proximity for  
32 major fault system damage practically inevitable is here, and here is INEL, this little island that  
33 there's no problem. So, I think that we really need to look at experts and science to give us this  
34 kind of information that, in my book, appears to be based on politics, not on science.

35  
36 **[171-01, John Tanner]** The entire Snake River Plain has been known as an area of very low  
37 seismic activity, in spite of the high seismic activity in the surrounding hills and mountains. I was  
38 working at the chemical processing plant when the Mt. Borah earthquake, a giant earthquake  
39 struck, which caused a fault displacement of about, I think over 10 feet there, but we just barely felt  
40 a tremor at the chemical processing plant, at the INL. And I point out how well the reactors in Japan  
41 and Armenia have stood up to earthquakes that have happened there. I think it was Armenia, not  
42 Azerbaijan, which is next door.

43  
44 **[184-05, Kitty Vincent]** Who in their right mind would come to a city that has a nuclear facility  
45 eighteen miles to the West at the foot of one of the most active seismic areas in the country?  
46 Especially a facility that is owned and managed by a company that has a history of problems?  
47

48 **[191-21, Liz Woodruff]** Geology and Soils. Due to the indefinite storage of depleted uranium  
49 hexafluoride on site, seismic activity in the area of the proposed facility poses a major safety

1 hazard that could lead to a critical level accident. The NRC should clarify why a complete analysis  
2 of seismic risk is delayed until the Safety Evaluation Report.

3  
4 **Response:** As noted in Section 3.6 of the EIS and in accordance with 10 CFR 51.71(c) and  
5 NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with NMSS  
6 Programs" (NRC, 2003), a seismic hazards analysis is outside the scope of the EIS. The seismic  
7 hazards analysis is addressed in Section 1.3.3.4.1 of the SER, NUREG-1951 (NRC, 2010b). As  
8 discussed in Section 1.4 of the EIS, the development of the SER was closely coordinated with the  
9 EIS analysis. Section 3.6.1.1 of the EIS describes the seismic setting and earthquakes in the  
10 vicinity of the proposed EREF site as part of the regional geology discussion and summarizes the  
11 results of the probabilistic seismic hazard study conducted as part of the safety review of AES's  
12 license application and documented in the SER. Section 4.2.5.1 considers this information along  
13 with local soil and groundwater conditions to conclude that the liquefaction potential of soils near  
14 the proposed EREF is also low.

15  
16 Section 3.6.1.1 of the EIS provides a map (Figure 3-15) showing the locations of Quaternary faults  
17 and earthquakes of magnitudes greater than 3.0. This figure illustrates the low seismic activity  
18 within the Snake River Plain. A new map (Figure 3-17), based on information from the  
19 U.S. Geological Survey's Earthquake Hazards Program, has been added to Section 3.6.1.1 to  
20 illustrate the low level of ground shaking in the vicinity of the proposed EREF associated with  
21 earthquakes in the region.

22  
23 Note that there is no risk of a criticality accident involving depleted uranium in the storage yard as a  
24 result of seismic activity (or any other catastrophic event) as suggested in some of the comments.

### 25 26 **I.5.13 Water Resources**

27  
28 **Comment:** The following comment talks about injection wells through which waste was  
29 introduced into the aquifer.

30  
31 **[008-06, Carol Bachelder]** I would like to speak about water. I'm not a nuclear engineer. I'm  
32 not an expert in the field of water, but I've lived in Idaho most of my life, and I've educated  
33 myself a little bit. I watch the news, and I read, and I remember the aquifer from years ago when  
34 they had injection wells. Now, these injections wells were developed by nuclear scientists, and  
35 engineers, and professional people. And you know what they did? They put waste down into the  
36 aquifer, because at the time we thought that a little bit of waste wouldn't hurt anything. You  
37 know, just sort of diffuses into the aquifer, and won't hurt anybody. I like to compare it to just a  
38 little bit of Drano, you know, you put just a little Drano in your cereal, and it won't hurt you,  
39 because it's just a little bit. So, they invented the injection wells, and another reason that they  
40 thought this was safe was because they thought that there was very little movement of the water  
41 down there. And the scientists, they figured that out, there's no movement. But when they put  
42 microphones down into the injection wells, what did you get? You had gurgling.

43  
44 Now, still water doesn't gurgle, so they concluded that there was movement of the water. And  
45 the water was carrying the waste, and this was all done in the name of science.

46  
47 **Response:** No injection wells are associated with the proposed EREF project. Also there would  
48 be no wastewater discharges associated with the operation of the proposed EREF (see

1 Section 4.2.6.2 of the EIS). Therefore, contamination of the underlying aquifer would not be  
2 expected.

3  
4  
5 **Comment:** The following comment expresses concerns over the various potential avenues for  
6 water quality impacts and urges that updated information on the National Pollutant Discharge  
7 Elimination System (NPDES) permit process and water protection measures be presented in  
8 the Final EIS.

9  
10 **[138-05, Christine Reichgott, on behalf of the U.S. Environmental Protection Agency,**  
11 **Region 10]** The DEIS indicates that water quality may be adversely affected if the project  
12 construction activities (blasting, surface grading, excavation, and surface pavement, building  
13 roofs) alter the hydrology of springs and surface runoff such that erosion carries sediment and  
14 pollutants to local drainages (p. 4-32), accelerating infiltration and migrating through soils to the  
15 underlying aquifer. Also, groundwater extraction, land disturbance, material storage, waste  
16 disposal, inadvertent chemical or hazardous liquid spills, and compaction produced by vehicular  
17 traffic can all affect recharge to the local aquifer and groundwater quality. Because of such  
18 potential impacts to water quality, we recommend that this aspect of the project be monitored to  
19 assure that water quality is protected. The NRC should continue to coordinate with IDEQ and  
20 Tribes that may be affected by the project to assure that the state and tribal water resources  
21 (quantity and quality) are protected and used judiciously.

22  
23 Since the project anticipates obtaining a National Pollutant Discharge Elimination System  
24 (NPDES,) permit for planned preconstruction and construction activities likely to disturb up to  
25 nearly 600 acres, the final EIS should include updated information on the permit application  
26 process and measures to protect water quality.

27  
28 **Response:** As stated in Table 1.2, and Sections 4.2.5.3 and 4.2.6.3 of the EIS, AES must  
29 obtain an NPDES Construction General Permit for its site preparation and construction  
30 activities. The NPDES permit sets standards and limits pertaining to the facility's industrial  
31 wastewater, sewage, and stormwater discharges. Updates on the NPDES permitting process  
32 can be viewed on the EPA's website at: [http://cfpub.epa.gov/npdes/stormwater/noi/  
33 noidetail\\_new.cfm?ApplId=IDR10CI01](http://cfpub.epa.gov/npdes/stormwater/noi/noidetail_new.cfm?ApplId=IDR10CI01). This has also been added as a footnote to Table 1-2 in  
34 Section 1.5.2 and a footnote in Section 4.2.6 of the FEIS. Water protection (i.e., mitigation)  
35 measures to be implemented by AES are discussed in Section 4.2.6.3 and Chapter 5.

36  
37 *The NRC's purpose and need statements in its environmental review documents reflect that the*  
38 *NRC is not the implementer or funding entity for the proposed activity. As a result, when the*  
39 *NRC reviews a proposed action, its ability to impose additional requirements and mitigation and*  
40 *monitoring measures beyond those proposed as part of the application is limited to those with a*  
41 *reasonable nexus to providing protection for radiological health and safety and common*  
42 *defense and security. The NRC can, however, require that the facility be built in accordance*  
43 *with the submitted application, including mitigation measures proposed by the applicant that are*  
44 *not specifically required by or directly related to the NRC's regulations. Thus, the NRC does*  
45 *have the ability to hold licensees to key mitigation measures committed to in their applications*  
46 *and subsequently incorporated in the NRC license directly or by reference.*

1 **Comment:** The following comment encourages the use of low impact development techniques  
2 to reduce adverse water resource impacts.

3  
4 **[138-06, Christine Reichgott, on behalf of the U.S. Environmental Protection Agency,**  
5 **Region 10]** In keeping with the use of sustainable practices, we encourage NRC to consider  
6 use of Low Impact Development (LID) techniques during the proposed project activities because  
7 some of them have the potential to reduce stormwater volumes and thus mimic natural  
8 conditions as closely as possible. The techniques also lessen the impacts of stormwater runoff  
9 from impervious surfaces such as paved parking lots, roads and roofs, and can provide energy  
10 other utility savings. More information about LID practices can be found online at:  
11 <http://www.low/impactdevelopment.org/> and <http://www.epa.gov/smartgrowht/stormwater.htm>.

12  
13 **Response:** *The EPA's "low impact development" practices have been added to the list of*  
14 *mitigation measures recommended by the NRC in Section 4.2.6.3 and in Chapter 5, Table 5-2.*

15  
16 *The NRC's purpose and need statements in its environmental review documents reflect that the*  
17 *NRC is not the implementer or funding entity for the proposed activity. As a result, when the*  
18 *NRC reviews a proposed action, its ability to impose additional requirements and mitigation*  
19 *measures beyond those proposed as part of the application is limited to those with a reasonable*  
20 *nexus to providing protection for radiological health and safety and common defense and*  
21 *security. The NRC can, however, require that the facility be built in accordance with the*  
22 *submitted application, including mitigation measures proposed by the applicant that are not*  
23 *specifically required by or directly related to the NRC's regulations. Thus, the NRC does have*  
24 *the ability to hold licensee's to key mitigation measures committed to in their applications and*  
25 *subsequently incorporated in the NRC license directly or by reference.*

26  
27  
28 **Comment:** The following comment expresses concerns regarding the amount of water that will  
29 be used in the enrichment process, and the safety of the filtration system that will be used for  
30 the evaporation process.

31  
32 **[183-02 and 183-08, James Vincent]** I also am particularly concerned with the amount of  
33 water that will be used in the enrichment process, and the safety of the filtration system that will  
34 be utilized for the evaporation process.

35  
36 **Response:** *The amount of water expected to be used by the proposed EREF is less than the*  
37 *current appropriation for water use; therefore, the amount of water used would have a SMALL*  
38 *impact, as further explained in Sections 4.2.6.1 and 4.2.6.2 of the EIS. Solid waste from the*  
39 *filtration system is addressed in Section 4.2.11.2, with SMALL impacts expected.*

40  
41  
42 **Comment:** The following comments are concerned with water quality permitting issues.

43  
44 **[027-12, Sara Cohn]** It is unclear under what authority NRC may offer exemptions for  
45 preconstruction activities when such impacts extend outside of NRC jurisdiction. For example  
46 preconstruction activities may impact waters protected under the Safe Drinking Water Act – the  
47 Eastern Snake River Plain Aquifer. The project must consult with EPA in order to ensure the



1 preconstruction activities will not impact the Eastern Snake River Plain aquifer, a sole source  
2 aquifer for eastern Idaho.

3  
4 **[066-20, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality] 18.**  
5 The Proposed Eagle Rock Enrichment Facility potable water system will be classified as a non-  
6 transient non-community public water system and subject to the requirements of the Idaho  
7 Rules for Public Drinking Water Systems (IDAPA 58.01.08). DEQ expects that AES will comply  
8 with all applicable regulations of the DEQ concerning the design, construction and operation of  
9 the water system (Refer to IDAPA 58.01.08 for official rule language).

10  
11 **[066-21, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality] 19.**  
12 Clean Water Act/surface water issues and requirements  
13 We expect that AES will comply with all applicable DEQ regulations concerning surface and  
14 ground water quality protection including but not limited to the requirements of IDAPA 58.01.02  
15 and IDAPA 58.01.1 1. In that regard, DEQ would identify the following issues that this EIS  
16 should consider and that AES in preconstruction, construction and operation should note:

- 17  
18 • There are a number of intermittent or ephemeral streams on the property. AES will need  
19 to obtain a Clean Water Act Section 404 dredge and fill permit from the US Army Corps of  
20 Engineers (USACOE) if these are deemed waters of the U.S. and AES plans to place  
21 dredge or fill material in the streams. The USACOE and EPA make the determination if a  
22 stream is considered waters of the U.S.
- 23  
24 • Construction projects larger than 1 acre are required to get coverage under the  
25 construction storm water general permit from EPA if the storm water discharges to waters  
26 of the U.S.
- 27  
28 • If storm water discharges to waters of the U.S., then AES should determine whether this  
29 facility is regulated under EPA's Multi-sector General Permit (MSGP) for storm water.

30  
31 **[036-03, Christina Cutler, on behalf of the Shoshone-Bannock Tribes]** Question on what  
32 about the water permits, not only the permits to use water for processing but also potable water,  
33 as well the permits for disposal of water from the processing as well as septic water. They will  
34 also need to address plant protection runoff water issues.

35  
36 **Response:** *The approvals and permits pertaining to water use, water quality, and water runoff,*  
37 *required for preconstruction, construction, and operation of the proposed EREF must be*  
38 *obtained by AES from other regulatory agencies. Tables 1-1 and 1-2 of the EIS list applicable*  
39 *requirements and the agencies to which AES must submit the appropriate applications.*

40  
41 *The Safe Drinking Water Act and Idaho Administrative Procedures Act (IDAPA) 58.01 are listed*  
42 *in Table 1-2 as potentially applicable permitting and approval requirements for the proposed*  
43 *EREF's drinking water system.*

44  
45 *The U.S. Army Corps of Engineers has issued a letter (Joyner 2008) stating that a Section 404*  
46 *permit (authorized by the Clean Water Act) is not required for the intermittent streams located*  
47 *on the proposed EREF property (see Table 1-2). A statement to this effect has also been*  
48 *added to Section 3.7.1.*

1 *Updates on the NPDES construction permitting process can be viewed on the EPA's website at:*  
2 *[http://cfpub.epa.gov/npdes/stormwater/loi/noidetail\\_new.cfm?ApplId=IDR10CI01](http://cfpub.epa.gov/npdes/stormwater/loi/noidetail_new.cfm?ApplId=IDR10CI01).*  
3  
4

5 **Comment:** The following comments present observations on water use and threats to the  
6 Eastern Snake River Plain (ESRP) Aquifer.  
7

8 **[007-01, Arnold Ayers]** For one, disposal wells don't gurgle. For two, we put monitors around  
9 those wells which Jack Barraclough was well associated with, and instigated in the back history  
10 of his time to monitor those things. And those wells worked, and those wells were able to  
11 monitor what was coming out of the facilities directly under the facilities, as well as outside of  
12 the facilities. If AREVA is monitoring what's going on, as they should do, there will be no  
13 discharges that I can see that could ever come undetected from those facilities, in my  
14 experience.  
15

16 **[023-02, Rebecca Casper]** I will tell you that at no time since April 2007 has there been one  
17 official conversation or unofficial conversation that I'm aware of, of the need for us, as a  
18 planning committee, to prepare to alter our plan for any threats that might be posed by AREVA.  
19 We were in existence before AREVA came on the scene. We still are, and it's never been a  
20 problem. We've more talked about climate change than we have from threats of radioactivity, or  
21 anything like that.  
22

23 I will say that we've had no discussion, in my opinion, not because we've been remiss, but  
24 rather because there are no threats that meet the worry and action threshold. Again, we care  
25 about the safety and quality of the water. We would not -- we would be remiss in our duties if we  
26 didn't explore every viable threat out there. And I am confident that my friend Jack would have --  
27 he spoke earlier -- would have told you if there were some threats.  
28

29 **[102-02, R.D. Maynard]** After reviewing the summary of the environmental consequences and  
30 mitigation section of the draft EIS, I'm confident that any potential negative impact on the air and  
31 water resources would be small.  
32

33 **[133-06, Richard Provencher]** The facility does not require a large amount of water to operate.  
34 This is good from an aquifer conservation and a waste minimization standpoint.  
35

36 **[143-03, Hon. James Risch; 172-03, Amy Taylor, on behalf of Hon. James Risch]** The  
37 process will use 50 times less electricity than a gaseous diffusion plant, and the amount of water  
38 used by the plant is less than the current irrigation appropriation.  
39

40 **Response:** *The comments are consistent with the NRC's finding that impacts on water*  
41 *resources from preconstruction, construction, and operation of the proposed EREF would be*  
42 *SMALL.*  
43  
44

45 **Comment:** The following comments express concern about contamination of the ESRP Aquifer  
46 as a result of the proposed EREF project.  
47

48 **[008-07, Carol Bachelder]** Another thing about the water was the hearings I went to several  
49 months ago in Mountain Home, again, the scientists, the nuclear scientists were going to build a

1 reactor, and they started in one county, and it was disproved, and they went to another county  
2 and it was disproved. The Snake River Alliance finally called this nuclear reactor Idaho's  
3 "Nomadic Nuclear Reactor," which wasn't very scientific, but boy, it was funny. I mean, I liked  
4 that. The "Nomadic Nuclear Reactor," because nobody wanted it. And the hearings from them  
5 were mainly from the farmers around there. It was an agricultural area, and they were scared,  
6 and they were mad, because they said this nuclear reactor is going to take our water. And this is  
7 the west. And a lot of fights, and hangings, and range wars happened in the early west over  
8 water. This is still the west, and these farmers were saying we don't want this nuclear reactor  
9 here, and so it was disproved, and now it's off down somewhere else trying to get approval. And  
10 that is stuff I've learned from the Snake River Alliance. They're not -- maybe they're not  
11 scientific, maybe they're not totally educated, but they have a contribution to make.

12  
13 **[010-02, Jack Barraclough]** When they say that this plant is going to ruin the aquifer, just read  
14 the EIS and find out they're not going to discharge. And if they do, the monitor will pick it up and  
15 changes will be made. So. I don't worry about this plant and what its effect on the aquifer is.

16  
17 **[014-01, William Blair]** Idaho does not need more radioactive waste placed over the Snake  
18 Plain Aquifer in an active earthquake area. Until a safe method of handling and storing  
19 radioactive wastes for thousands of years is devised, NO new facilities should be approved.

20  
21 **[015-05, Beatrice Brailsford]** The most domestic part of the proposal is that the waste will, in  
22 fact, stay here. The plant would produce 320,000 tons of depleted uranium hexafluoride over its  
23 licensed lifetime, and the door is already ajar for the license to be extended. That waste might  
24 be stored on outdoor concrete pads above the Snake River aquifer until the plant is  
25 decommissioned.

26  
27 It's worth noting that New Mexico sharply limits how much, and how long waste can stay at the  
28 plant there. The waste has to be treated before it can be disposed of. Two government-owned  
29 treatment plants are under construction, over budget, and behind schedule. Waste the U.S. has  
30 already accumulated will take a combined 43 years to process.

31  
32 **[015-14, Beatrice Brailsford]** The EREF will produce more than 350,000 tonnes of depleted  
33 uranium hexafluoride (DUF6) over its licensed lifetime, and the door is already ajar for the  
34 license to be extended. That waste would be stored in 25,718 cylinders on outdoor concrete  
35 pads above the Snake River Aquifer as long as the plant operates. DUF6 is both radioactive  
36 and chemically toxic and has to be treated before it can be disposed of. The DOE has built two  
37 plants to treat depleted uranium hexafluoride waste the US has already accumulated. That  
38 treatment will take a combined 43 years to process. A private US corporation is seeking a  
39 license for its own treatment plant. The draft EIS cavalierly dismisses any potential bottlenecks  
40 by stating that the waste could simply be sent to the DOE treatment plants before they're ready  
41 to process it and then their operating lives extended. But it is at least as likely that the DUF6 will  
42 be stored in Idaho for an uncertain length of time above the Snake River Aquifer, a sole source  
43 aquifer for nearly 300,000 people. Storage under these conditions must be fully evaluated under  
44 NEPA.

45  
46 **[017-03, Sally Briggs]** At Stake is the very air we all breath and the water we receive from our  
47 amazing and priceless aquifer.

48

1 **[019-01, George Buehler]** As a long time resident of Southeast Idaho, I am very disturbed by  
2 the possibility of the Areva Uranium Enrichment being located in my neighborhood. This area is  
3 above a highly permeable aquifer which provides water for the most populous cities in the state.  
4

5 **[020-01, Tracey Busby]** I do not support the idea of putting any type of nuclear plant /  
6 enrichment facility above the Snake River Aquifer for the obvious environmental risks.  
7

8 **[025-02, Hon. Sue Chew]** So, you know, when I look at the fact that we have an aquifer, and  
9 we have potential waste that would be created upstream, I want to make sure that we have a  
10 good plan there when we look at transportation into Idaho and out, that those things are  
11 considered.  
12

13 **[027-11, Sara Cohn]** Water Resources: The ICL is very concerned that spillage or leakage of  
14 hazardous materials and waste from the proposed facility will further contaminate Idaho's  
15 surface or groundwater. We are concerned that there will be large quantities of hazardous,  
16 toxic, and radioactive materials produced and stored onsite and that these materials may  
17 contribute to existing contamination of Idaho's waters. The Snake River Plain Aquifer is  
18 southern Idaho's primary source of drinking and irrigation water and is already contaminated  
19 with materials stored within the Idaho National Laboratory as well as nutrients associated with  
20 historical and existing agricultural practices. Should the facility operations result in further  
21 contamination of the aquifer, this pollution would have wide reaching affects on public health  
22 and Idaho's agricultural economy. Toxic and radioactive materials from enrichment facilities  
23 have been shown to leak through detention basins and contaminate groundwater. We are very  
24 concerned the proposed facility may contaminate Idaho's waters the way similar facilities have  
25 contaminated groundwater in Paducah, KY and Portsmouth, OH.  
26

27 Due to the amount of pollutants expected to be stored onsite, the extremely hazardous nature of  
28 waste products like depleted uranium, the possibility of waste spills, the possibility of leakage  
29 from proposed retention basins, and the importance of the Snake River Plain Aquifer, much  
30 more information is needed, in the final EIS, to ensure no endangerment of public health or  
31 contamination of precious water resources. We request more information with regard to the  
32 amount of waste and hazardous materials expected to be stored onsite, the types of  
33 preventative measures that will be in place to ensure no contamination of water, as well as  
34 plans outlining monitoring and reporting methods and responsible parties. The applicant should  
35 also prepare reports and plans that detail the roles and responsibilities of agencies and AREVA  
36 in the event of spillage or contamination from the site. These plans should outline remediation,  
37 public alerts, public safety measures, and clean up strategies, among all other necessary  
38 actions to protect environmental and public health.  
39

40 Nitrate contamination of groundwater is also of concern. Recent findings indicate that long-term  
41 exposure to elevated concentrations of nitrate may contribute to the risk of developing bladder  
42 and ovarian cancers and non-Hodgkin's lymphoma.  
43

44 **[030-03, Kerry Cooke]** One of the worst places anyone could think of for nuclear waste is  
45 above the Snake River Plain Aquifer.  
46

47 **[032-02, Cindy Cottrell]** Another reason Idaho should never be considered is because of the  
48 risk involved to main waterways and land. If any accident were to occur which exposes the

1 environment to radiation or the storing of the waste to do so, it would contaminate much more  
2 area than if it were next to the ocean somewhere. It would first contaminate one of the largest  
3 underground aquifers, then continue down the beginning of the Snake River, passing all through  
4 Southern Idaho and then into the Columbia River, contaminating the length of Oregon and  
5 Washington before reaching the ocean. The contamination would ruin lands that grow needed  
6 crops and range land for wildlife and cattle. The fish would also suffer and eventually the ocean  
7 life would suffer. If it was near the ocean, it would reach the ocean which would be a disaster  
8 but at least the in land would be free of the radiation.

9  
10 **[040-01 and 040-04, Collin Day]** But are we really willing to risk storing all this stuff right on top  
11 of an aquifer? It makes no sense to me. I mean, not only -- I mean, can you guarantee that  
12 30 years from now, there will be no accidents, and none of that's going to leak into an  
13 aquifer?... But there's just no need to take risks and gamble with things like the aquifer that,  
14 you know, supplies drinking water to some 300,000 people, because 500 people need jobs.

15  
16 **[048-01, Genevieve Emerson]** As a fifth generation steward of the land in Southern Idaho, as  
17 well as a biologist, I found that the EIS for the proposed Eagle Rock Facility fails to consider  
18 how such a facility, poised directly over the Snake River Aquifer, could have extremely serious  
19 health implications for both wildlife and human beings who rely on this sole source of precious  
20 water in a high mountain desert.

21  
22 **[050-04, Joanie Fauci]** There is also the question, unknown scientific impact, of the interaction  
23 of the waste and water. There is risk of it getting into the aquifer as well as how it reacts with  
24 rain and excess moisture.

25  
26 Safety should be given the highest risk factor in the EIS.

27  
28 **[068-02, Anne Hausrath]** I am very much opposed to the storage of radioactive [waste] above  
29 an important aquifer. This is a huge risk that I do not believe has been adequately addressed.

30  
31 **[074-01, Don Howard]** I've been on the focus group at INEL forever, under Mark Marinett  
32 (phonetic). We'd go out and we'd look at the site and the projects, and when you say a leach to,  
33 on the water, well, they have a deal out there called Pit 9, that they dump this raw nuclear waste  
34 in, and it's down, I think, about 139 feet in the aquifer, Under it is down about 459 feet. And if we  
35 have leach, the gentleman said that they was putting a leach to rejuvenate the waters.

36  
37 **[078-04, Hon. Wendy Jaquet]** I could not get a feeling for the safety processes that would  
38 make me feel comfortable regarding our sole source aquifer. After the BP fiasco, I am now more  
39 concerned.

40  
41 **[087-02, Dennis Kasnicki]** Comment 2a: Many attendees expressed concern regarding  
42 contamination, especially depleted uranium, getting into the Snake River Aquifer; that, by far,  
43 seemed to be the biggest concern, and rightfully so. Does AREVA's Integrated Safety  
44 Assessment address ALL CREDIBLE accident scenarios whereby depleted uranium (or other  
45 contamination) could get into the Snake River Aquifer? Are the "probabilities" of all such  
46 scenarios deemed at least "highly unlikely", or otherwise meet the requirements of 10 CFR 70?  
47 If so, or if not, this should be loudly and clearly "called out" in the Draft EIS.



1 **[092-01, Ginna and Ken Lagergren]** The Areva plant is a BAD idea anywhere, and even  
2 worse where they want to locate it over the Snake River Aquifer. Please listen to the testimony  
3 of the organization Snake River Alliance for all the scientific reasons why the Areva uranium  
4 factory should NEVER BE BUILT!!!  
5

6 **[100-04, Wendy Matson]** The facility will store radioactive waste above the sole-source aquifer  
7 for nearly 300,000 people. This scares me. This threat to a vital and unique resource outweighs  
8 any perceived benefit of the facility.  
9

10 **[102-01, R.D. Maynard]** I'm interested in any potential impacts to the environment, particularly  
11 the Snake River aquifer, that construction and operation of the Eagle Rock enrichment facility  
12 might cause.  
13

14 Past waste disposal practices at the INL site, along with land application of fertilized and  
15 pesticides, and excessive irrigation, have already caused some contamination of the aquifer.  
16

17 **[103-03, Karen McCall]** The radioactive risk to Idaho is significant as this plant is proposed to  
18 be built upstream of the Snake River Aquifer which is already contaminated by the activities at  
19 the INL. Further degradation of this enormous water source is unacceptable and a risk to  
20 agriculture in the state.  
21

22 **[105-05, Eve McConaughy]** No mention was made of the potential contamination of the  
23 aquifer or mention made of the location near the Snake River.  
24

25 **[110-01, John and Susan Medlin]** As the Snake River Alliance presentation pointed out, there  
26 is no current need for this facility, no compelling evidence that a nuclear renaissance is coming  
27 (or inevitable), no rationale for a French company building a nuclear facility in Idaho that  
28 purports to promote US energy security while importing inputs and exporting outputs, no  
29 provision for the deteriorating and dangerous waste that will haunt us for decades or maybe  
30 forever, no concern for yet another threat to the Snake River aquifer, the lifeblood of Idaho  
31 agriculture.  
32

33 So how can the NRC conclude that building this facility is vital, and that the most problematic  
34 outcome to be evaluated is construction dust?  
35

36 **[122-04, Kathy O'Brien]** I am also concerned about the wildlife in the area as well as the  
37 Snake River Aquifer. This must be taken into account and given priority.  
38

39 **[128-04, Bob Poyser]** Second, during the design of this facility, AREVA has applied standards  
40 for environmental practices and protection above and beyond acceptable industry practices,  
41 wherever possible. At the Eagle Rock facility, even rainwater runoff from the site will be directed  
42 to a storm water retention basin. Similarly treated liquid waste from the domestic sanitary sewer  
43 treatment plant will be directed to a fully lined retention basin with no outlet.  
44

45 The lined retention basins will use evaporation, thus precluding any interaction with the water in  
46 the aquifer.  
47

48 These additional features are a part of Areva's commitment to sustainable development, and  
49 the deployment of our best know-how to protect the environment.  
50

1 **[147-06, Joey Schueler]** The site of this nuclear facility is located directly above the Snake  
2 River Aquifer, which supplies water to over 300,000 individuals in Idaho (including the entire  
3 Treasure Valley).  
4

5 **[150-01, Katie SeEVERS]** The potential for a nuclear facility, which will site over a sole source  
6 aquifer for about 300,000 residents, is beyond disconcerting. The location of the facility above  
7 the Snake River aquifer causes further alarm when additional environmental effects are  
8 considered.  
9

10 **[153-01, Andrea Shipley; 197-01, Andrea Shipley, on behalf of the Snake River Alliance]**  
11 Areva's proposed uranium enrichment factory will store radioactive waste above the sole source  
12 aquifer for nearly 300,000 people,  
13

14 **[168-03, Lon Stewart]** What does Idaho get out of this? We get highly radioactive waste that  
15 increases in intensity over time, we get a chance to pollute the Eastern Snake River Aquifer, the  
16 main source for water for all of Southeast Idaho and then pollute the Snake River which flows  
17 through the Southwest portion of the state....  
18

19 **[181-06, Roger Turner]** It would be opposed, because the waste is likely to remain in eastern  
20 Idaho, posing a risk to the Snake River Plain Aquifer.  
21

22 **[183-01, James Vincent]** Since the two US de-conversion facilities are not operational, and if  
23 they do become operational they will first process already existing depleted uranium waste for  
24 60 plus years of existing waste, from the 100 plus nuclear energy producing plants here in the  
25 US, the timeline for the removal of the on site storage of Uranium hexafluoride DUF6 from Idaho  
26 is in doubt. I have a problem with storing this waste above ground and possible leaching of  
27 contaminants into the aquifer for our state.  
28

29 Their figures are that these are increasing to 2,000 metric tons per year. And, in addition, there's  
30 like 12 million cubic feet of low-level waste from these plants. Supposedly, we have around  
31 60,000 metric tons of waste in this country that we have to get rid of one way or another.  
32

33 **[183-07, James Vincent]** Since the two US de-conversion facilities are not operational, and if  
34 they do become operational they will first process already existing depleted uranium waste for  
35 60 plus years of existing waste, from the 100 plus nuclear energy producing plants here in the  
36 US, the timeline for the removal of the on site storage of Uranium hexafluoride DUF6 from Idaho  
37 is in doubt. I have a problem with storing this waste above ground and possible leaching of  
38 contaminants into the aquifer for our state.  
39

40 **[184-02, Kitty Vincent]** What matters is Areva's history of leaks and pollution overseas as well  
41 as the fact that this plant would sit atop this magnificent aquifer.  
42

43 **[184-01, Kitty Vincent]** Water is a resource in scarce supply in the West. The Snake River  
44 aquifer is a huge water source for now and the future in not only the State of Idaho but also the  
45 entire West. While several scientists at the meeting denied the potential threat to this water  
46 source by the Areva project -- they are not employed by Areva so whatever expertise they have  
47 is a moot point.  
48

1 **[184-07, Kitty Vincent]** Areva's proposed Eagle Rock Enrichment Facility (EREF) will store  
2 radioactive waste above the sole source aquifer for nearly 300,000 people;

3  
4 **[191-33, Liz Woodruff]** The facility will store radioactive waste above the sole source aquifer  
5 for nearly 300,000 people. This threat to a vital and unique resource outweighs any perceived  
6 benefit of the facility.

7  
8 **[192-05 and 192-11, Lisa Young]** Idaho will not allow for this kind of risk, especially over its  
9 precious aquifer, which could easily be contaminated after an accidental spill of depleted  
10 uranium hexafluoride waste. With a spill of this material, the radioactive material has a potential  
11 to enter the aquifer and poison our sole source of water.

12  
13 **[192-11, Lisa Young]** This risk is unacceptable anywhere with the storage of depleted uranium  
14 hexafluoride, and Idaho will certainly not allow for this kind of risk, especially over its precious  
15 aquifer, which could easily be contaminated after an accidental spill of depleted uranium  
16 hexafluoride waste...poisoning our sole water source.

17  
18 **Response:** *As discussed in Section 4.2.6.2 of the EIS, there would be no wastewater*  
19 *discharges associated with the operation of the proposed EREF. Chemical spills or releases*  
20 *around vehicle maintenance and fueling locations, storage tanks, and painting operations are*  
21 *not expected to affect groundwater in the Eastern Snake River Plain aquifer because it occurs*  
22 *at great depths (about 660 ft) below the ground surface (see Section 3.7.2.2) and contaminants*  
23 *would likely be cleaned up quickly and otherwise likely adsorbed by overlying soils long before*  
24 *reaching the aquifer. Compliance with the facility's Spill Prevention Control and*  
25 *Countermeasures (SPCC) Plan would minimize the likelihood of inadvertent releases to the*  
26 *ground surface during all project phases. Therefore, contamination of the underlying aquifer*  
27 *would not be expected.*

28  
29 *Section 4.2.6.2 has been modified to provide further information on the measures (e.g., system*  
30 *or basin design) that would be taken by AES to assure that contaminated effluents are*  
31 *contained within the Liquid Effluent Collection and Treatment System and potentially*  
32 *contaminated effluents from the cylinder storage area are retained in the Cylinder Storage Pads*  
33 *Stormwater Retention Basins and that inadvertent releases would be detected and corrected in*  
34 *a timely manner. Releases associated with an accident would be addressed as part of the*  
35 *facility's emergency response planning with technical support and oversight from various*  
36 *Federal, State, and local agencies. Any ground contamination from depleted uranium material*  
37 *released by a potential accident would be isolated and retrieved in a timely manner.*

#### 40 **I.5.14 Ecological Resources**

41  
42 **Comment:** The following comment states that there is no discussion of impacts to the greater  
43 sage-grouse (*Centrocercus urophasianus*) from the operation of the plant, and that AES should  
44 place metal reflectors on the top wire of the fence to reduce the probability of sage-grouse  
45 colliding with the fence, thus reducing mortality.

46  
47 **[140-04, Wendy Reynolds, on behalf of the Bureau of Land Management, Upper Snake**  
48 **Field Office]** 3) The BLM appreciates the lengthy and thorough discussion of the greater sage

1 grouse, particularly in the affected environment section of the document. In terms of the  
2 analysis, however, there is no discussion of impacts to the greater sage grouse from the  
3 operation of the plant. Here too, as with the impacts from preconstruction and construction  
4 activities, the greater sage grouse would likely avoid the area due to human presence, noise,  
5 and the use of artificial lights resulting in habitat displacement over an area substantial larger  
6 than the footprint of the facility itself. Further, indirect impacts would occur once the boundary  
7 fence is in place. Greater sage grouse are known to collide with the top wire of fences like the  
8 fence proposed to encircle the AES property. Such collisions are known to be a source of  
9 mortality amongst local and regional sage grouse populations. In view of this fact, the BLM  
10 requests that AES place metal reflectors on the top wire of the fence. This mitigation measure  
11 has been shown in recent preliminary and, as of yet, unpublished studies to reduce the  
12 probability of sage grouse colliding with fence, thus reducing mortality.

13  
14 **Response:** *Wildlife avoidance of the areas around the proposed facility is acknowledged in*  
15 *Section 4.2.7.2 of the EIS, Facility Operation. Additional information has been included in*  
16 *Section 4.2.7.2 regarding effects on sage-grouse during operation of the proposed EREF.*  
17 *Information regarding the inclusion of markers on the boundary fence and metal reflectors on*  
18 *the top wire of the fence has been added to the NRC-recommended additional mitigation*  
19 *measures in Section 4.2.7.3 and Table 5-4, Section 5.2.*

20  
21 *When NRC reviews a proposed action, its ability to impose additional requirements and*  
22 *environmental mitigation measures beyond those proposed as part of the license application is*  
23 *limited to those with a reasonable nexus to providing protection for radiological health and*  
24 *safety and common defense and security. The NRC can, however, require that the proposed*  
25 *facility be built in accordance with the submitted application, including mitigation and monitoring*  
26 *measures proposed by the applicant that are not specifically required by or directly related to*  
27 *NRC's regulations. Thus, the NRC does have the ability to hold licensees to key mitigation*  
28 *measures committed to in their applications and subsequently incorporated in the NRC license*  
29 *directly or by reference.*

30  
31  
32 **Comment:** The following comment expresses concern that the transmission lines compound  
33 the negative impact that will accrue to wildlife, and points to the Idaho Department of Fish and  
34 Game's (IDFG's) comments on this matter.

35  
36 **[015-20, Beatrice Brailsford]** The transmission lines compound the negative impact the will  
37 accrue to pronghorn antelope, greater sage grouse, and ferruginous hawks, which will all likely  
38 abandon the Areva site and surrounding areas. Sage grouse is a candidate species for federal  
39 protection. The Idaho Department of Fish and Game reaffirmed the threats transmission lines  
40 would pose to wildlife, challenged the methodology of sage grouse and lek analysis in the draft  
41 EIS, recommended burying transmission lines, and suggested Areva submit to plans to mitigate  
42 for the expected wildlife impacts. These concerns do not appear to have been addressed in this  
43 EIS and must be addressed before any preconstruction activities are allowed or before this EIS  
44 review continues.

45  
46 **Response:** *The concerns of IDFG are addressed in the EIS. A supplementary lek survey was*  
47 *conducted by AES (see Section 3.8.3), and AES is committed to coordinating with IDFG during*  
48 *monitoring (see Section 6.2.2). Measures for the protection of birds would be implemented in*

1 *the construction of the transmission lines (see Section 4.3.7). Regarding transmission line*  
2 *burial, the cumulative impacts of a proposed, above-ground, 161-kV transmission line that*  
3 *would serve the proposed EREF are analyzed (see Section 4.3), and this analysis concludes*  
4 *that the line would have SMALL contributions to cumulative impacts in all resource areas.*  
5 *Information regarding monitoring of the transmission line right-of-way for avian mortality has*  
6 *been added to Section 6.2.2.*

7  
8  
9 **Comment:** The following comment asks the NRC to incorporate design features in the  
10 proposed EREF project to minimize impacts to ecological resources and to prepare a plan to  
11 mitigate for impacts that cannot be avoided or minimized.

12  
13 **[027-22, Sara Cohn]** *Avoid, Minimize, Mitigate:* In terms of priorities, the NRC should first site  
14 facilities and infrastructure to avoid impacts to wildlife and cultural resources. If impacts cannot  
15 be entirely avoided, the NRC should incorporate design features to minimize impacts. Lastly, a  
16 plan should be prepared to mitigate for impacts that cannot be avoided or minimized.

17  
18 **Response:** *The siting of a uranium enrichment facility involves a number of requirements, as*  
19 *discussed in Section 2.3.1 of the EIS. Environmental protection was one of the criteria*  
20 *categories used. Mitigation measures identified by AES to minimize impacts to wildlife during*  
21 *preconstruction, construction, and operation of the proposed EREF are presented in*  
22 *Section 4.2.7.3 and Chapter 5.*

23  
24 *The NRC's action with regard to the proposed EREF project is limited to granting a license, if*  
25 *found to be warranted, for the construction, operation, and decommissioning of the proposed*  
26 *facility. NRC is not the implementer or funding entity for the proposed activity. As a result, NRC*  
27 *generally limits its analysis to the alternatives and actions reasonably available to the applicant.*

28  
29 *When NRC reviews a proposed action, its ability to impose additional requirements and*  
30 *environmental mitigation and monitoring measures beyond those proposed as part of the*  
31 *license application is limited to those with a reasonable nexus to providing protection for*  
32 *radiological health and safety and common defense and security. The NRC can, however,*  
33 *require that the proposed facility be built in accordance with the submitted application, including*  
34 *mitigation and monitoring measures proposed by the applicant that are not specifically required*  
35 *by or directly related to NRC's regulations. Thus, the NRC does have the ability to hold*  
36 *licensees to key mitigation and monitoring measures committed to in their applications and*  
37 *subsequently incorporated in the NRC license directly or by reference.*

38  
39  
40 **Comment:** The following comment expresses concern regarding impacts to sage-grouse.

41  
42 **[027-23, Sara Cohn]** There is significant concern regarding the long-term viability of greater  
43 sage-grouse populations. The US Fish and Wildlife Service concluded that Greater sage-grouse  
44 are warranted for protections under the Endangered Species Act but this action is precluded by  
45 other priorities. The US Fish and Wildlife Service will continue to reassess the status of sage-  
46 grouse. If sage-grouse are listed, the protections could have far reaching effects on land  
47 management in Idaho and in the region.



1 Greater sage-grouse suffer from the loss, degradation, and fragmentation of habitat throughout  
2 the west. It's estimated that only 50-60% of the original sagebrush steppe habitat remains in the  
3 west (West 2000), and in 2007, the American Bird Conservancy listed sagebrush as the most  
4 threatened bird habitat in the continental United States. 4 As such, we cannot stress enough  
5 how important it is for agencies to consider impacts to sage-grouse, conserve existing habitat,  
6 and actively restore altered sagebrush steppe habitats due to project-related impacts.

7  
8 Depending on location and design specifics, the construction of additional roads within sage-  
9 grouse habitat could constitute "nonlinear infrastructure" under the *Conservation Plan for the*  
10 *Greater Sage-grouse in Idaho (Idaho Sage-Grouse Advisory Committee 2006)*. Nonlinear  
11 infrastructure is defined as "human-made features on the landscape that provide or facilitate  
12 transportation, energy, and communications activities." The *Conservation Plan* lists  
13 infrastructure such as this as the second greatest threat for sage grouse, with wildfires as the  
14 greatest risk. Road construction and use associated with the facility represents high risk for loss  
15 of lek areas, nesting locations, and brood-rearing habitats (Braun 1986, Connelly et al. 2004)

16  
17 *Coordination with local stakeholder groups:* We believe that an integral part of conserving and  
18 recovering sage-grouse will be relying on the guidance from local stakeholder groups. As such,  
19 we recommend that the applicant coordinate further efforts more closely with the US Fish and  
20 Wildlife Service, local Sage-grouse Working Groups, the Idaho State Sage Grouse Advisory  
21 Council, the Idaho Department of Fish and Game, and the Governor's Office of Species  
22 Conservation. Conservation groups to consult include the Audubon Society, the Idaho Chapter  
23 of the North American Grouse Partnership, the Idaho Falconer's Association, the Nature  
24 Conservancy, the Western Watersheds Project as well as the Idaho Conservation League.

25  
26 ***Response:*** *Impacts on sage-grouse are discussed in Section 4.2.7 of the EIS, along with*  
27 *mitigation measures that include the planting of disturbed areas with sagebrush steppe species.*  
28 *As shown in Figure 4-4, the site access road avoids sagebrush steppe habitat, being located*  
29 *entirely within nonirrigated pasture. AES has committed to working with the U.S. Fish and*  
30 *Wildlife Service (FWS), Bureau of Land Management (BLM), and IDFG in the development of*  
31 *action levels and/or reporting levels for the ecological monitoring program for the proposed*  
32 *EREF (see Section 6.2.2.1). These agencies work with many conservation groups for the*  
33 *protection of sage-grouse and other species.*

34  
35 *When considering the long-term viability of sage-grouse populations the proposed action is*  
36 *evaluated considering short term impacts during preconstruction and construction*  
37 *(Section 4.2.7.1) and cumulative impacts (Section 4.3.7) during the life of the facility. By*  
38 *necessity, the viability of an entire population has to be viewed at the ecosystem level. The*  
39 *ecosystem level used in this analysis was the Upper Snake sage-grouse planning area as*  
40 *described in the July 2006 Idaho sage-grouse conservation plan (ISAC, 2006). The evaluation*  
41 *takes into account past, present and reasonably foreseeable impacts. As part of the evaluation*  
42 *it was recognized that past actions have caused extensive habitat fragmentation at the*  
43 *proposed site and future actions were evaluated in terms of the incremental contribution to*  
44 *environmental impacts from an area already heavily impacted by prior activities (e.g., cultivation*  
45 *and cattle grazing). For example, the July 2006 plan describes the impact of roads as a linear*  
46 *infrastructure feature and contributor to habitat fragmentation. US 20 is considered to be a*  
47 *major highway in the project area and forms the southern boundary of the proposed EREF site.*

1 The July 2006 plan describes taking into account a 6.2 mile buffer on either side of a major road  
2 to account for its impact.

3  
4  
5 **Comment:** The following comment discusses the effects of operation of the proposed EREF on  
6 sage-grouse that are on public land.

7  
8 **[089-05, Sharon Kiefer, on behalf of the Idaho Department of Fish and Game]** Recent  
9 research on sage-grouse suggests that disturbance-related impacts from energy development  
10 on counts of displaying male sage-grouse at leks were apparent out to 6.4 km or approximately  
11 4 miles (Naugle et al. *in press*), and that most (79%) nests occur within 4 miles of leks (Doherty  
12 et al. *in press* citing Colorado Division of Wildlife 200S-Appendix B Page 7). As noted in the  
13 DEIS the property is adjacent to mapped key sage-grouse habitat with one sage-grouse lek  
14 approximately 3.5 miles away from the site. Presence of an industrial facility this distance from  
15 occupied sage-grouse habitat remains a consideration although we recognize the facility direct  
16 footprint excludes occupied habitat.

17  
18 There are guidelines that should be considered to help steer significant construction activity that  
19 could benefit sage-grouse. The Upper Snake Sage-Grouse Local Working Group work plan  
20 includes the following recommendation that would be applicable: *All land management agencies*  
21 *adjust timing of energy exploration, development, and construction activity to minimize*  
22 *disturbance of sage-grouse breeding activities. Energy-related facilities should be located*  
23 *>3.2 kilometers from active leks whenever possible. Human activities within view of or*  
24 *<0.5 kilometers from leks should be minimized during the early morning and late evening when*  
25 *birds are near or on leks.* [http://fishandgame.idaho.gov/hunt/grouse/conserv\\_e\\_plan/upsnake\\_](http://fishandgame.idaho.gov/hunt/grouse/conserv_e_plan/upsnake_workplan.pdf)  
26 [workplan.pdf](http://fishandgame.idaho.gov/hunt/grouse/conserv_e_plan/upsnake_workplan.pdf)

27  
28 Likewise, Idaho Bureau of Land Management's (BLM) Seasonal Wildlife Restrictions and  
29 Procedures for Processing Requests for Exceptions On Public Lands in Idaho (Information  
30 Bulletins No. ID-2010-039) also includes recommendations for controlled surface and timing  
31 limitation use near sage-grouse leks and/or nesting/early brood rearing habitat: *Potentially*  
32 *disruptive larger-scale construction activities (e.g. , infrastructure/ energy development and*  
33 *similar projects), shall be avoided within 6.4 km (~4 miles) of occupied or undetermined status*  
34 *sage-grouse leks from March 1 to June 30 to reduce disturbance to lekking or nesting grouse*  
35 *(and/or hens with early broods).*

36  
37 If monitoring indicates sage-grouse do avoid public lands surrounding the facility due to post-  
38 construction operational effects, such as lights and roads, we request AES to determine  
39 corrective action or to mitigate the offsite public lands lost to wildlife due to project effects.

40  
41 **Response:** AES has committed to the consideration of all recommendations of the FWS and  
42 IDFG (see Section 4.2.7.3 of the EIS), and to working with the FWS, BLM, and IDFG in the  
43 development of action levels and/or reporting levels for the ecological monitoring program for  
44 the proposed EREF (Section 6.2.2.1). A measure recommending that AES coordinate with  
45 IDFG regarding corrective action or mitigation has been added to the NRC-recommended  
46 additional mitigation measures in Section 4.2.7.3 and Table 5-4, Section 5.2.

1 *The NRC's purpose and need statements in its environmental review documents reflect that the*  
2 *NRC is not the implementer or funding entity for the proposed activity. As a result, when the*  
3 *NRC reviews a proposed action, its ability to impose additional requirements and mitigative*  
4 *measures beyond those proposed as part of the application is limited to those with a reasonable*  
5 *nexus to providing protection for radiological health and safety and common defense and*  
6 *security. The NRC can, however, require that the facility be built in accordance with the*  
7 *submitted application, including mitigation measures proposed by the applicant that are not*  
8 *specifically required by or directly related to the NRC's regulations. Thus, the NRC does have*  
9 *the ability to hold licensees to key mitigation measures committed to in their applications and*  
10 *subsequently incorporated in the NRC license directly or by reference.*

11  
12  
13 **Comment:** The following comment recommends that the NRC continue to work with the FWS  
14 and IDFG as the project is implemented to monitor risks to individual species and identify  
15 effective measures to reduce risks and protect the species and their habitat; and to also  
16 coordinate with the Idaho National Laboratory (INL) and BLM due to their long term experiences  
17 monitoring impacts to the species and associated habitats in and around the proposed project  
18 area.

19  
20 **[138-07, Christine Reichgott, on behalf of the U.S. Environmental Protection Agency,**  
21 **Region 10]** Sections 4.2.7 discuss the project's impacts to ecological resources, including  
22 vegetation and wildlife species. The DEIS indicates that vegetation removal, habitat  
23 fragmentation, and ground disturbance would result in moderate impacts on plant communities  
24 and wildlife species (p. 4-44). Most impacts to these resources would occur primarily on almost  
25 592-acre area of the ERF footprint. About 185 acres of sagebrush steppe, 136 acres of non-  
26 irrigated pastures, and 268 acres of irrigated cropland habitats would be lost. Such habitat loss  
27 and alterations would impact a number of species including sage grouse, which is a candidate  
28 species for listing under the Endangered Species Act, pygmy rabbits, and nesting migratory  
29 birds and other species of concern (p. 4-46). Noting that some of the impacts would be indirect,  
30 others would be direct, cumulative and unavoidable.

31  
32 We appreciate measures to limit the project footprint impacts, including replanting almost  
33 133 acres of that footprint with native species after construction activities and eliminating  
34 grazing within the entire project area (4200 acres). Because of an arid environment at the  
35 project site, however, planted vegetation would take years to establish or restoration could fail,  
36 thus exacerbating loss of cover and habitat for the species. Given the usage of the project area  
37 by sage-grouse and other sensitive wildlife species, and limited survey data for the species, it is  
38 important that the NRC continue to work with the US Fish and Wildlife Service and the Idaho  
39 Department of Fish and Game (IDFG) as the project is implemented to monitor risks to  
40 individual species and identify effective measures to reduce risks and protect the species and  
41 their habitat, particularly loss, degradation, and fragmentation of the sagebrush steppe habitat  
42 due to construction activities, wildfire, and agriculture. Also, we believe that it would be useful  
43 for the project to coordinate with the Idaho National Laboratory and Bureau of Land  
44 Management due to their long term experiences monitoring impacts to the species and  
45 associated habitats in and around the proposed project area.

46  
47 **Response:** AES has committed to ongoing coordination with the FWS, IDFG, and BLM during  
48 ecological monitoring program activities for the proposed EREF project (see Section 6.2.2.1 of

1 *the EIS). A recommended mitigation measure that AES should also coordinate with INL has*  
2 *been added to the NRC-recommended additional mitigation measures in Section 4.2.7.3 and*  
3 *Table 5-4 in Section 5.2.*

4  
5 *The NRC's purpose and need statements in its environmental review documents reflect that the*  
6 *NRC is not the implementer or funding entity for the proposed activity. As a result, when the*  
7 *NRC reviews a proposed action, its ability to impose additional requirements and mitigative*  
8 *measures beyond those proposed as part of the application is limited to those with a reasonable*  
9 *nexus to providing protection for radiological health and safety and common defense and*  
10 *security. The NRC can, however, require that the facility be built in accordance with the*  
11 *submitted application, including mitigation measures proposed by the applicant that are not*  
12 *specifically required by or directly related to the NRC's regulations. Thus, the NRC does have*  
13 *the ability to hold licensee's to key mitigation measures committed to in their applications and*  
14 *subsequently incorporated in the NRC license directly or by reference.*

15  
16  
17 **Comment:** The following comment recommends that the Final EIS include a discussion of how  
18 issues such as ecological impacts raised by Tribes would be addressed by the project.

19  
20 **[138-08, Christine Reichgott, on behalf of the U.S. Environmental Protection Agency,**  
21 **Region 10]** Consultation with Tribal Governments - The draft EIS indicates that there have  
22 been contacts with Tribes that may be affected by the proposed project. This is especially  
23 important because the DEIS states that the project would result in up to large impacts to  
24 resources important to tribes (p. 4-4), including historical and cultural, visual, and ecological  
25 resources. Construction activities, for example, would destroy historic and cultural resources at  
26 MW004 site, while increased traffic and construction activities and the presence of an industrial  
27 complex would significantly alter the visual landscape. Because of these and other impacts that  
28 may be discovered during the project operations, we recommend that the final EIS include a  
29 discussion of how issues raised by Tribes would be addressed by the project and outcomes of  
30 the ongoing work with the Idaho State Historic Preservation Office and affected Tribes on  
31 potential effects requiring Section 106 review of the National Historic Preservation Act.

32  
33 **Response:** *Consultation with the affected Federally recognized Shoshone-Bannock Tribes has*  
34 *been ongoing throughout the EIS process. The ecological impacts associated with the project*  
35 *are discussed in Section 4.2.7.*

36  
37  
38 **Comment:** The following comment expresses concerns that an historical landmark and  
39 expanse of Idaho native habitat will be destroyed to build the proposed plant and that there  
40 would be no return to the area's natural state after plant decommissioning

41  
42 **[147-15, Joey Schueler] 11.** A historical landmark and a vast expanse of Idaho native habitat  
43 will be destroyed to build this plant. After plant decommission, there will be no return to this  
44 valuable area of Idaho's beautiful wilderness.

45  
46 **Response:** *There is an estimated 9,013,000 acres of land identified as existing key sage-*  
47 *grouse habitat in Idaho. Approximately 592 acres on the 4200-acre proposed EREF property*  
48 *would be disturbed by construction and operation of the proposed EREF, as discussed in*



1 Section 4.2.1 of the EIS. The remainder of the 4200-acre property would revert to a more  
2 natural state because cultivation and grazing activities on the site would cease, as noted in  
3 Section 4.2.1.3. Thus, the land use impacts are considered to be SMALL and the general  
4 character of the surrounding land is better preserved. Impacts on habitats are considered and  
5 described in Section 4.2.7. Impacts related to decommissioning are discussed in  
6 Section 4.2.16.7 and I.5.21. Impacts related to historic and cultural resources are described in  
7 Sections 4.2.2 and I.5.9.  
8  
9

10 **Comment:** The following comment asks for more serious consideration of the wildlife species  
11 that will be affected by construction, operation, and decommissioning of the proposed facility,  
12 including the sage-grouse.  
13

14 **[192-17, Lisa Young]** Indeed, I hope to see much more serious consideration of the wildlife  
15 species that will be affected by all three stages of construction, operation, and decommissioning  
16 of this facility, including the fact that the sage grouse, well-known to be a vulnerable species in  
17 need of federal protection, makes its home in this region.  
18

19 **Response:** As discussed in comment responses above, additional NRC-recommended  
20 mitigation measures for the protection of wildlife have been added to the EIS, in Section 4.2.7.3  
21 and Chapter 5, Table 5-4; and additional information regarding sage-grouse has been added in  
22 Section 4.2.7.2.  
23  
24

25 **Comment:** The following comments express concerns about the wildlife in the area.  
26

27 **[122-04, Kathy O'Brien]** I am also concerned about the wildlife in the area as well as the  
28 Snake River Aquifer. This must be taken into account and given priority.  
29

30 **[153-01, Andrea Shipley; 197-01, Andrea Shipley, on behalf of the Snake River Alliance]**  
31 AREVA's proposed uranium enrichment factory will...impact sensitive species  
32

33 **[184-07, Kitty Vincent]** Areva's proposed Eagle Rock Enrichment Facility (EREF) will store  
34 radioactive waste above the sole source aquifer for nearly 300,000 people; impact sensitive  
35 species; require the transport of radioactive materials; impair the Hell's Half Acre National  
36 Monument; support destruction of the John Leopard homestead, which has been recommended  
37 for the National Register of Historic Places; devour billions of dollars in state and federal  
38 largess; and obliterate farmland that is potentially protected by the federal government. The  
39 Alliance is here to say it is not worth the risk.  
40

41 **Response:** Impacts on wildlife have been assessed and are discussed in Section 4.2.7 of the  
42 EIS. Impacts would be SMALL to MODERATE. Mitigation measures for the protection of  
43 wildlife are identified in Section 4.2.7 and Chapter 5.  
44  
45

46 **Comment:** The following comments suggest that beneficial ecological impacts could occur at  
47 the proposed EREF site outside of the disturbed area footprint.  
48



1 **[067-02, Mike Hart]** In terms of ecological impacts of the site, one thing I noticed was again the  
2 analysis of the fact that you'll not -- you'll be ceasing grazing on that area, which for sage  
3 grouse, the reality is what really causes threatened and endangered species listing of sage  
4 grouse is not spoken -- but it's cows.

5  
6 So, actually, getting cows off that range, and reseeded it with natural native plants, will actually  
7 probably improve sage grouse habitat significantly, and I think you list it as a light impact.  
8 Actually, I would go so far as to say it might actually be a benefit, of having an area. But when  
9 you do reseed, do go with natives rather than reseeding with crested wheat grass or other non-  
10 native species that are invasive.

11  
12 **[067-10, Mike Hart]** With respect to ecological impacts, sage grass, I think having, and I  
13 apologize to the farmers here, but I think getting the cows off the land will help the sage grass, and  
14 let's just leave it at that.

15  
16 **Response:** *The NRC acknowledges the potential for habitat improvement once grazing is not*  
17 *practiced on the proposed EREF property. This is discussed in Sections 4.2.7.1 and 4.2.7.2 of the*  
18 *EIS.*

19  
20  
21 **Comment:** The following comments express concerns about minimizing impacts to affected  
22 habitat and wildlife during construction and operation of the proposed EREF.

23  
24 **[027-20, Sara Cohn]** Ecological Resources: The draft EIS does not adequately address  
25 impacts to ecological resources on site and the preconstruction exemption guarantees the loss  
26 of large areas of habitat to sensitive and candidate species such as greater sage-grouse and  
27 pygmy rabbit. The US Fish and Wildlife Service determined that greater sage-grouse warrant  
28 protection under the Endangered Species Act, but listing is currently precluded by the need to  
29 respond to other species at greater risk of extinction. As such, the greater sage-grouse is  
30 considered a candidate species for listing and the status will be reviewed annually by the US  
31 Fish and Wildlife Service. The BLM and Forest Service currently consider the greater sage-  
32 grouse as a Sensitive Species.

33  
34 The pygmy rabbit (*Brachylagus idahoensis*) is currently considered as a candidate species by  
35 the US Fish and Wildlife Service, a Sensitive Species by the Bureau of Land Management, a  
36 Species of Special Concern (Category C – Undetermined Status Species) on the Idaho State  
37 Sensitive Species List (*Idaho Conservation Data Center, 1994*), and is managed by the Idaho  
38 Department Idaho Fish and Game as protected, non-hunted species. As with greater sage-  
39 grouse, loss of sagebrush steppe habitat has fragmented habitat and the US Fish and Wildlife  
40 Service is conducting a status review to determine whether to propose listing under the  
41 Endangered Species Act.

42  
43 Because listing under the Endangered Species Act (ESA) is a possibility for both species, we  
44 suggest the applicant design the project to avoid, minimize and mitigate for any impacts.  
45 Furthermore, these steps should be submitted for review in the environmental analysis.

46  
47 **Preconstruction Exemption:** It is unclear under what authority NRC may offer exemptions for  
48 preconstruction activities when such impacts extend outside of NRC jurisdiction. For example

1 preconstruction activities will impact sensitive and candidate species. Project impacts would  
2 normally require NRC to coordinate with the Idaho Department of Fish and Game in order to  
3 analyze and release for public comment the environmental and public health impacts of  
4 preconstruction clearing, blasting, and grading prior to conducting such activities. According to  
5 the draft EIS, such preconstruction activities are expected to take place prior to the licensing of  
6 the proposed facility. These efforts undermine the purpose of the EIS process. A mitigation plan  
7 must be created to avoid, minimize, and plan for mitigation of affected habitat....  
8

9 *Habitat, habitat fragmentation, and migration corridors:* Portions of the project area contain  
10 habitat that is crucial to the sagebrush steppe obligate species such as sage-grouse, pygmy  
11 rabbits, sage thrasher, sage sparrow, and others. Such habitat has been severely fragmented  
12 and reduced through a variety of land management practices, including road construction and  
13 development of rights of way corridors. Although communities cannot be listed under the  
14 endangered species act, sagebrush steppe habitat is considered by federal agencies as  
15 “imperiled” and an area of primary concern. The project should avoiding areas of critical habitat  
16 for species of concern, minimize negative impacts by using seasonal restrictions and other  
17 recommendations in the Idaho State Sage-Grouse Plan, and mitigate for any potential impacts  
18 by working directly with the Idaho Department of Fish and Game and Local Sage-grouse  
19 Working Groups. In addition, the NRC should establish siting criteria to minimize soil  
20 disturbance and erosion on steep slopes, utilize visual resource management guidelines, and  
21 avoid significant historic and cultural resource sites....  
22

23 *Additional Wildlife:* In addition to sage-grouse, other wildlife including pygmy rabbits, sage  
24 thrasher, sage sparrow, and birds of prey, are of concern. New construction and infrastructure  
25 will also change crucial habitat for these species and may inhibit the ability of these species to  
26 migrate. The project design should avoid construction in any designated areas or lands for  
27 special management of these species. There are also elk, mule deer, and pronghorn antelope in  
28 the proposed project area. The project should avoid and minimize all impact to big game winter  
29 habitat. The project site contains good to excellent antelope and sage-grouse habitat. We are  
30 concerned how the proposed project will impact this important habitat and the species that  
31 depend on it. We are also greatly concerned the project will impact nesting habitat for migratory  
32 birds.  
33

34 *Invasive Weeds:* The most cost-effective way to deal with noxious weeds is to protect  
35 strongholds of native vegetation from activities that either spread noxious weeds directly or  
36 create suitable habitat by removing native vegetation and disturbing the soil. Project activities  
37 should limit road construction in areas that contain mineral soils where weeds may become  
38 established. Roads serve as a primary route for noxious weed species expansion. Special care  
39 should be taken to safeguard ecologically intact areas that are not currently infested. The EIS  
40 needs to analyze the effects of noxious weeds and describe management of weeds in the  
41 project area. For example, management strategies may include ensuring the tires and  
42 undercarriage of access vehicles are hosed down prior to site access to dislodge noxious  
43 weeds. Further documentation should analyze the effects of regular weed control activities in  
44 previously undisturbed areas. For example, weed treatments may affect non-target species and  
45 vehicle access may increase fire hazard and soil disturbance.  
46

47 **[036-05, Christina Cutler, on behalf of the Shoshone-Bannock Tribes]** Endangered species  
48 may or may not be at the site at the time of survey; however it is known that there are

1 endangered species and sensitive species in the immediate area. How is there habitat and  
2 survival going to be addressed, not just during operation of the facility but also and maybe most  
3 important during the construction phase.

4  
5 **Response:** *Mitigation measures for impacts to ecological resources during preconstruction,*  
6 *construction, and operation of the proposed EREF are included in Section 4.2.7.3 and*  
7 *Chapter 5 of the EIS. In response to other comments in this section, additional NRC*  
8 *recommended mitigation measures have been added to the EIS, in Section 4.2.7.3 and*  
9 *Chapter 5, for protection of sage-grouse, preventing the introduction of invasive plant species,*  
10 *and minimizing indirect effects of weed control activities.*

11  
12 *Impacts and mitigation should be understood in the context that the environment at the site has*  
13 *been degraded by past agricultural and cattle grazing activities and at the ecosystem level*  
14 *provides marginal habitat for sagebrush obligate species. In addition, the sage-grouse habitat*  
15 *in the Upper Snake sage-grouse planning area is about 2.5 million acres in size with*  
16 *approximately 83 percent of this habitat found on State or Federally owned and/or managed*  
17 *lands with associated protections.*

18  
19 *As shown in Figure 4-4, much of the project footprint is located outside of the sagebrush steppe*  
20 *habitat, and the site access road avoids sagebrush steppe habitat, being located entirely within*  
21 *nonirrigated pasture. In addition, grazing impacts would be removed from the remaining*  
22 *sagebrush steppe, and the remaining irrigated crop areas would be planted with native species.*  
23 *AES has committed to working with the FWS, IDFG, and BLM in the development of action*  
24 *levels and/or reporting levels for the EREF ecological monitoring program (Section 6.2.2.1).*  
25 *These agencies work with many conservation groups for the protection of sage-grouse and*  
26 *other species. Section 4.2.7 discusses invasive plant species and control measures,*  
27 *acknowledging that nontarget species may be affected.*

28  
29  
30 **Comment:** The following comments express a concern that the true scale of ecological impacts  
31 is larger than that presented in the EIS.

32  
33 **[083-06, Diane Jones]** Finally, I'd just like to say the EIS found only small and moderated  
34 impacts from this project, this proposed project. One of the things that was looked at is removal  
35 of sagebrush steppe and that was regarded as a moderate. I would like to say that when  
36 sagebrush steppe is removed, it's removed, and it does not come back for a long time. That's  
37 not small or moderate. It's a very large impact.

38  
39 **[086-04, Paula Jull]** Antelope, sage grouse, and ferruginous hawks all will likely abandon the  
40 Areva site and surrounding areas due to development and human activity. Sage grouse is a  
41 candidate species for federal protection. The problem is compounded by construction of the  
42 electric transmission line and poles proposed to support the facility, which sage-grouse are  
43 known to avoid because they serve as perches for raptors.

44  
45 **[088-08, Stan Kidwell; 095-08, Linda Leeuwrik]** Pronghorn antelope, greater sage grouse,  
46 and ferruginous hawks all will likely abandon the Areva site and surrounding areas due to  
47 development and human activity. Sage grouse is a candidate species for federal protection. The  
48 problem is compounded by construction of the electric transmission line and poles proposed to

1 support the facility, which sage-grouse are known to avoid because they serve as perches for  
2 raptors.

3  
4 **[153-10, Andrea Shipley]** Accidents, fire, air and water quality and the development of on this  
5 land will impact several species including raptors and sage-brush obligate species (draft  
6 EIS 4.2.7) Pronghorn antelope, greater sage-grouse, and ferruginous haws all will likely  
7 abandon the EREF site and area surrounding the EREF due to development and human  
8 activity. Sage-grouse is a candidate species for federal ESA protection. USFWS recently  
9 concluded that listing under the ESA is warranted, though formal listing is precluded by other  
10 agency priorities. The EIS is inaccurate based on the true scale of ecological effects and the  
11 problem is compounded by construction of the proposed electric transmission line and poles,  
12 which sage-grouse are known to avoid because they serve as perches for raptors.

13  
14 **[197-10, Andrea Shipley, on behalf of the Snake River Alliance]** Accidents, fire, air and  
15 water quality and the development of on this land will impact several species including raptors  
16 and sage-brush obligate species (draft EIS 4.2.7).

17  
18 **[175-08, Ellen Thomas]** Pronghorn antelope, greater sage grouse, and ferruginous hawks all  
19 will likely abandon the Areva site and surrounding areas due to development and human  
20 activity. Sage grouse is a candidate species for federal protection. The problem is compounded  
21 by construction of the electric transmission line and poles proposed to support the facility, which  
22 sage-grouse are known to avoid because they serve as perches for raptors.

23  
24 **[183-13, James Vincent]** I also believe that EIS does not fully take into account the impact on  
25 antelope, sage grouse, and birds of prey.

26  
27 **[184-15, Kitty Vincent]** Accidents, fire, air and water quality degradation and the development  
28 of this land will impact several species including raptors and sage-brush obligate species (draft  
29 EIS 4.2.7) Pronghorn antelope, greater sage grouse, and ferruginous hawks all will likely  
30 abandon the EREF site and surrounding areas due to development and human activity. Sage  
31 grouse is a candidate species for federal protection. The problem is compounded by  
32 construction of the proposed electric transmission line and poles, which sage-grouse are known  
33 to avoid because they serve as perches for raptors.

34  
35 **[191-15, Liz Woodruff]** Ecology. • According to the NRC's own definition of the significance of  
36 potential impacts, a large impact is one that "the environmental effects are clearly noticeable  
37 and are sufficient to destabilize important attributes of the resource." According to the draft EIS,  
38 the sage-brush steppe located within the proposed EREF would improve due to the elimination  
39 of grazing. The NRC must flesh out the connection between claims of potential improvements  
40 and the amount of habitat that will be compromised.

41  
42 • Several species will be impacted by development on this land including sensitive species,  
43 raptors, and sage-brush obligate species (draft EIS 4.2.7). Pronghorn antelope, greater sage-  
44 grouse, and ferruginous hawks all will likely abandon the EREF site and areas surrounding the  
45 EREF due to development and human activity. It is difficult to see how, when an ecosystem is  
46 considered as a whole, it be improved if the animals that depend on it can no longer use it. In  
47 other words, it is not a healthy sagebrush ecosystem if there are no antelope, grouse, and

1 hawks. The conclusion of small to medium potential ecological/wildlife impacts contained in the  
2 draft EIS is inaccurate based on the true scale of ecological effects.

3  
4 • This problem is compounded by construction of the proposed electric transmission line and  
5 poles, which sage-grouse are known to avoid because they serve as perches for raptors.

6  
7 • Sage-grouse is a candidate species for federal ESA protections. USFWS recently concluded  
8 that listing under the ESA is warranted, though formal listing is precluded by other agency  
9 priorities. The treatment of the threats to sage grouse is inadequate in the draft EIS.

10  
11 **[193-20, Liz Woodruff, on behalf of the Snake River Alliance]** And all of the issues  
12 associated with the construction of this facility--accidents, fire, air and water quality degradation,  
13 the development of this land will impact several species, including raptors and sagebrush  
14 obligate species. This includes the sage grouse. The sage grouse is a candidate species for  
15 federal protection, and the only reason it's not listed yet is because of bureaucratic process of  
16 listing. There's a delay. But the treatment of this issue is inadequate in the draft EIS.

17  
18 The impacts to sage grouse from transmission and preconstruction warrant integration into this  
19 EIS, or separate EISs, specifically around preconstruction and transmission issues.

20  
21 **[197-14, Andrea Shipley, on behalf of the Snake River Alliance]** The EIS is inaccurate  
22 based on the true scale of ecological effects, and the problem is compounded by construction of  
23 the proposed electric transmission line and poles, which sage grouse are known to avoid  
24 because they serve as perches for raptors.

25  
26 **Response:** *The EIS acknowledges that many wildlife species would likely avoid the area near*  
27 *the proposed facility during its construction and operation. The above comments do not present*  
28 *information to support the statement that wildlife would avoid the entire 4200-acre proposed*  
29 *EREF property. Other areas of the proposed property would still be usable as habitat, and*  
30 *sagebrush steppe in those areas would be expected to improve over time. For the species that*  
31 *use the sagebrush steppe habitat (including that which is contiguous to and outside the*  
32 *proposed EREF property), such as pronghorn antelope, sage-grouse, and ferruginous hawk,*  
33 *construction of the proposed EREF would noticeably alter that habitat, with a loss of 185 acres*  
34 *plus an area of avoidance; however, this would neither destabilize the habitat used by these*  
35 *species nor the species' populations because extensive sagebrush habitat is available outside*  
36 *the proposed EREF property, as described in Section 4.2.7.1 of the EIS. Text has been added*  
37 *in Section 4.2.7.2 to clarify impacts to sage-grouse during operations.*

38  
39 *The impacts have taken into account that the sage-grouse habitat in the Upper Snake sage-*  
40 *grouse planning area is about 2.5 million acres in size with approximately 83 percent of the*  
41 *habitat found on State or Federally owned and/or managed lands. It should be further noted*  
42 *many species adapt to disturbances and the fact that facilities such as this prohibit hunting as*  
43 *evidenced by extensive areas of surface coal mining and reclamation in similar types of habitats*  
44 *in Montana, Wyoming and Utah.*



1 **I.5.15 Noise**

2  
3 No comments were received on the noise section of the Draft EIS.  
4  
5

6 **I.5.16 Transportation**

7  
8 **Comment:** The following comment acknowledges the adequate safeguards that are in place for  
9 shipping containers for radioactive waste materials such as spent nuclear fuel.  
10

11 **[007-03, Arnold Ayers]** I've been involved with such things as a first responder from the Three  
12 Mile Island reactor, and also was associated with the retrieval, but mostly with the arrival of that  
13 fuel here in INL. That puts me in the prospect of knowing what's involved in transportation of  
14 spent nuclear fuel. And yes, it is complicated, and yes it is difficult, and yes it has been solved  
15 relatively well, quite well, in fact. The adequate safeguards that the NRC has put on materials  
16 on shipping containers for that waste material has shown itself, and has proven itself time, and  
17 time, and time again.  
18

19 **Response:** *No spent nuclear fuel (SNF) would be generated at, or shipped to or from, the*  
20 *proposed EREF. Transportation regulations for the shipment of the uranium materials used and*  
21 *produced at the EREF are discussed in Appendix D of the EIS and are protective of human*  
22 *health and the environment.*  
23  
24

25 **Comment:** The following comment contends that the Draft EIS does not consider methods to  
26 minimize risks associated with alternative transport route options and transportation modes.  
27

28 **[027-09, Sara Cohn]** The documents provided do not consider methods to minimize risks  
29 associated with transport routes options. Alternative transportation modes, such as rail, should  
30 be analyzed. Transportation routes and modes that present significant risk to public health and  
31 natural resources should be avoided.  
32

33 **Response:** *Transportation routes are determined by carriers in accordance with U.S.*  
34 *Department of Transportation (DOT) regulations, which attempt to reduce potential hazards by*  
35 *avoiding populous areas and minimizing radiological risks. Route selection is described in*  
36 *Appendix D, Section D.3.1.1, of the EIS.*  
37

38 *As noted in Sections 3.10.2 and 4.2.9.2, AES does not plan to perform any shipping operations*  
39 *via rail because rail access is not readily available at or near the proposed EREF site. To use*  
40 *rail as a transportation mode, shipments to and from the proposed EREF would require truck*  
41 *transport to the nearest intermodal facility, which could incur additional risks to workers and*  
42 *potentially the public at such facilities.*  
43  
44

45 **Comment:** The following comment emphasizes the opportunity for public comment in each and  
46 every community through which radioactive material would be transported, and that the Fort Hall  
47 Indian Reservation needs to be a part of this process.  
48

1 **[028-01, David Coney]** One thing I'd like to emphasize is public comment in each and every  
2 community that any transportation of radioactive material goes through. Specifically because  
3 today is World Indigenous Day, I would say that the Fort Hall Indian Reservation needs to be a  
4 part of this process. That's huge. And I just returned from an encampment down in New Mexico  
5 where I witnessed, firsthand, the desecration of community due to the nuclear military-industrial  
6 complex.

7  
8 **Response:** *Impacts from transportation of materials to and from the proposed EREF are*  
9 *discussed in Section 4.2.9 of the EIS. These impacts would be SMALL. Residents of the Fort*  
10 *Hall Indian Reservation have had the opportunity to comment on the Draft EIS. In addition,*  
11 *NRC staff met with the Shoshone-Bannock Tribal Council on August 11, 2010, to brief them on*  
12 *the Draft EIS and discuss their concerns.*

13  
14 *Transportation routes are determined by carriers in accordance with DOT regulations, which*  
15 *attempt to reduce potential hazards by avoiding populous areas and minimizing radiological*  
16 *risks. Those routes are also determined based on the origin and destination of shipments and*  
17 *are not presently known. Therefore, holding public comment meetings in every community*  
18 *through which transportation of radioactive material would occur would not be feasible.*  
19 *However, all members of the public, regardless of their location, have had the opportunity to*  
20 *provide comments on the Draft EIS, either in person or by postal mail or email.*

21  
22  
23 **Comment:** The following comment mentions that permanent impacts associated with the  
24 proposed project would include the construction of two access roads from US Highway 20 to the  
25 proposed project site.

26  
27 **[027-10, Sara Cohn]** Permanent impacts associated with the project include the construction of  
28 two access roads from Highway 20 to the project site.

29  
30 **Response:** *Traffic impacts associated with construction of the two access roads from US 20 are*  
31 *addressed in Section 4.2.9.1 of the EIS. The associated air quality and noise impacts are*  
32 *addressed in Sections 4.2.4.1 and 4.2.8.1, respectively. In addition, please note that as*  
33 *acknowledged in the response to Comment 142-01 below from Mr. Blake Rindlisbacher of the*  
34 *Idaho Transportation Department (ITD), plans for access to US 20 have not been finalized, and*  
35 *no decision has been made about whether to use two full-time operational connections.*

36  
37  
38 **Comment:** The following comment requests that Highway Route Controlled Quantity (HRCQ)  
39 routing be written into the AES license as a condition of transportation operations since it was  
40 used in the risk analysis.

41  
42 **[066-16, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 14.  
43 Appendix D: pp. D-9, Lines 6-14. Under input parameters and route selection, HRCQ routing  
44 was used. Again on pp. D-30, Lines 14-15, *"the NRC staff used HRCQ routing for the*  
45 *transportation impact assessment in this EIS"*. DEQ would like to see this requirement written  
46 into the license as a condition of transportation operations since it was used in the risk analysis.

1 **Response:** *The IDEQ preference is noted. However, HRCQ routing is not required for any*  
2 *radioactive material shipments that would take place to or from the proposed EREF, as the*  
3 *quantity of radioactive material within any package would not exceed the HRCQ threshold.*  
4 *HRCQ routing was assumed in the transportation risk analysis because it results in longer*  
5 *routes and a more conservative estimate of population risk.*  
6

7  
8 **Comment:** The following comment identifies an error in Appendix D of the Draft EIS regarding  
9 the definition of the transport index (TI).

10  
11 **[066-17, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 15.  
12 Appendix D: pp. D-21, Lines 15-16. The transport index (TI) is incorrectly defined as the dose  
13 rate at 1 meter from the lateral sides of the transport vehicle. The correct definition is the highest  
14 measured dose rate at 1 meter from any side of the package surface.  
15

16 **Response:** *The text of Section D.3.5 of the EIS has been corrected to state that the TI is*  
17 *measured from the side of the package surface, as opposed to the side of the transport vehicle.*  
18 *By using the TI of the package, without consideration of shielding by a transport vehicle, the*  
19 *most conservative dose rate values have been assumed in the transportation risk assessment.*  
20

21  
22 **Comment:** The following comment questions the source of the population density number used  
23 in Appendix D of the Draft EIS, and expresses disagreement with Table D-2.  
24

25 **[066-18, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 16.  
26 Appendix D: pp. D-23, Line 11 states "... assumed population density of one person per square  
27 kilometer (2.6 persons per square mile)." DEQ is not sure where this density number comes  
28 from and it is not in agreement with Table D-2 on pp. D-11, where the rural density is listed as  
29 9.5 persons per km<sup>2</sup>  
30

31 **Response:** *The emission risk factor is a unit risk factor (i.e., per unit area). As noted in*  
32 *Section D.3.6 of the EIS, this (unit) risk factor is multiplied by the average population density*  
33 *along the route and the route distance to obtain the one-way vehicle emission risk for the*  
34 *shipment. The text of Section D.3.6 has been clarified on this matter.*  
35

36 *The average rural population density for the route between the proposed EREF site and the*  
37 *DOE depleted uranium hexafluoride (UF<sub>6</sub>) conversion facility in Paducah, Kentucky, was*  
38 *determined using the WebTRAGIS routing model (as were all of the population densities in*  
39 *Table D-2). The value of 9.5 persons/km<sup>2</sup>, which accounts for all rural transportation segments*  
40 *in each State between the origin and destination (not just Idaho), has been verified. Table D-2*  
41 *is correct.*  
42

43  
44 **Comment:** The following comment addresses the number of truckloads of waste that would be  
45 transported over Idaho roads in need of repair.  
46

1 **[070-03, Virginia Hemingway]** We will also have approximately 2,000 truckloads of incoming  
2 waste being transported over our potholed roads which need fixing, more than we need a  
3 \$750,000 off-ramp to a spot where there is nothing currently, except sagebrush.  
4

5 **Response:** *Waste from operations of the proposed EREF would be transported from the*  
6 *proposed EREF site to licensed treatment, storage, and/or disposal facilities (TSDFs). No*  
7 *waste would be transported into Idaho from out-of-state locations as a result of preconstruction,*  
8 *construction, operation, or decommissioning of the proposed EREF. The only materials*  
9 *transported to the proposed EREF would be raw materials for preconstruction, construction, and*  
10 *operation, including UF<sub>6</sub> feed material for the enrichment process.*  
11

12 *Existing state and regional road conditions are not within the scope of the EIS. Road conditions*  
13 *will vary over the lifetime of the proposed facility. However, the text in Section 3.10 of the EIS*  
14 *has been modified to note that the 18-mile stretch of US 20 from Idaho Falls to the Bonneville-*  
15 *Butte county line was resurfaced during the summer of 2010.*  
16  
17

18 **Comment:** The following comment expresses the commenter's difficulty understanding the  
19 transportation issues to and from the proposed EREF.  
20

21 **[078-02, Hon. Wendy Jaquet]** 2. I couldn't understand the transportation issues back and forth  
22 to the enrichment plant. It seemed to make more sense to co locate.  
23

24 **Response:** *All shipments to and from the proposed EREF would occur by truck. The proposed*  
25 *EREF requires natural UF<sub>6</sub> feed material, which – as discussed in Section 4.2.9.2 of the EIS –*  
26 *would be shipped to the proposed EREF site from facilities in Illinois and Ontario, Canada, that*  
27 *convert uranium oxide to the fluoride form. The enriched UF<sub>6</sub> product from the proposed EREF*  
28 *would be sent to fuel fabrication facilities, such as those located in the States of Washington,*  
29 *North Carolina, and South Carolina (see Section 4.2.9.2), which convert the enriched fluoride*  
30 *product back to an oxide form and incorporate this material into fuel rods for commercial nuclear*  
31 *reactors (i.e., nuclear power plants). Co-location of the proposed EREF with any of these*  
32 *facilities – or with a natural uranium supplier, enriched uranium customer, or waste disposal site*  
33 *– could require significantly increased transport distances for the other materials because of the*  
34 *dispersed locations of these facilities. As discussed in Section 2.3.1, the site selection process*  
35 *also had other requirements necessary for the safe and economic operation of the proposed*  
36 *EREF that would preclude siting it near some of these other facilities.*  
37

38 **Comment:** The following comment identified improvements that have been made to US 20 to  
39 accommodate existing facilities and future development.  
40

41 **[098-01, Linda Martin]** Several comments have been made for the transportation. Due to the  
42 potential localized increase in traffic density along Highway 20, we have tried to think ahead,  
43 and we have tried to encourage improvements to that highway. These increased road  
44 improvements will currently affect and advantageously speed future travelers through INL, Sun  
45 Valley, Boise, and other tourist locales. So we think that that's a very important issue, that while  
46 it may not appear that anything is there now, there are people that go past those sections, and if  
47 you have several hundred people working, moving equipment and going through there, people  
48 are going to need increased transportation access.  
49

1 **Response:** *The NRC acknowledges this comment and recognizes that road improvements*  
2 *along US 20 have been advocated to support increased tourism and promote general*  
3 *development in the region.*

4  
5  
6 **Comment:** The following comment asks if AES will provide the Shoshone-Bannock Tribes with  
7 information on shipment of materials to and from the proposed EREF, and if AES will provide  
8 the Tribes with emergency response training.

9  
10 **[129-02, Willie Preacher, on behalf of the Shoshone-Bannock Tribes]** The Tribes  
11 Emergency Management Department questioned the transportation route of product to and from  
12 the Eagle Rock Enrichment Facility and will AREVA share information regarding the amount of  
13 shipments, hazards of the shipments, and will they provide training to the Tribes Emergency  
14 Management and Response staff to identify and respond to a transportation accident on the  
15 reservation.

16  
17 **Response:** *As noted in Section 4.2.9.2 and Appendix D of the EIS, product destinations include*  
18 *the States of Washington, North Carolina, South Carolina, Virginia, and Maryland. As noted in*  
19 *Section 3.10.1, Interstate 15 (I-15) would serve as the primary route for all incoming and*  
20 *outgoing truck shipments. Information about the number and hazard of shipments is provided in*  
21 *Section 4.2.9. It is the NRC staff's understanding, from discussions with the Shoshone-*  
22 *Bannock Tribes and with AES, that AES has coordinated, and will continue to coordinate, with*  
23 *the tribes regarding various matters of interest to the tribes.*

24  
25  
26 **Comment:** The following comment acknowledges that the Draft EIS is accurate with regard to  
27 the state highway system and the impacts the proposed project will have on it, and that the  
28 mitigation cited for those impacts is appropriate. Also, the comment cautions that it has not yet  
29 been decided whether access to US 20 will consist of two full-time, operational connections.

30  
31 **[142-01 and 142-02, Blake Rindlisbacher, on behalf of the Idaho Transportation**  
32 **Department]** Thank you for your early and close consultation with the Idaho Transportation  
33 Department in the development of this environmental impact statement. We believe the  
34 statement as expressed in this draft is accurate with regards to our state highway system and  
35 the impacts this project will have on it. The mitigation you cite for those impacts are indeed  
36 appropriate and we encourage the NRC to make ride sharing and shifts staggered from those of  
37 the Idaho National Laboratory a part of the operating license for AREVA Enrichment Services.  
38 We will continue to discuss with them the terms and conditions of their access to US-20, but  
39 specific operation behavior that may reduce risk is beyond our authority to require.

40  
41 With regards to the operational baseline stated in your statement, we offer this caution. We are  
42 concerned over the description of their access to our highway as having two full-time,  
43 operational connections; one east (the primary) and one west. This has not been decided. If we  
44 concentrate resources at the east side of their facility by building a grade-separated  
45 interchange, the need for a second, at-grade, access is triggered by phasing and the  
46 management of incidents, not full-time operations. As you state, we are in negotiation with the  
47 owner over terms and conditions. If the impacts are sensitive to the number and placement of  
48 access, please consider this information when making your decision.



1 **Response:** NRC acknowledges that plans for access to US 20 to/from the proposed EREF  
2 have not been finalized and that AES continues to consult with the ITD. The impacts described  
3 in the EIS are not believed to be sensitive to the number and placement of the access roads.  
4 However, the text of Section 4.2.9.1 of the EIS has been modified to clarify that plans for the  
5 access road(s) have not been finalized.  
6  
7

8 **Comment:** The following comment calls attention to a number of minor matters in the text of  
9 Section 3.10.1 of the Draft EIS.  
10

11 **[142-03, Blake Rindlisbacher, on behalf of the Idaho Transportation Department]** With  
12 regards to the facts in the draft, we would call your attention to the following minor matters. On  
13 page 3-75, line 24, the driving lanes on US-20 is given as 12.5 meter (41-feet): this appears to  
14 be a unit conversion error, as the driving lanes are generally 12 to 12.5 feet wide. On page 3-78,  
15 line 6, the speed limit is states as 55 mph: it is 65 mph. And finally, on page 7-78, lines 34-37,  
16 we are quoted as stating that the intersection of US 20 and I-15 "...may need to be upgraded to  
17 handle increased traffic from the proposed EREF...." While this grade-separated intersection is  
18 reaching the end of its useful life and presents a number of challenges for our maintenance  
19 team, neither the character nor the count of the traffic predicted off this facility will trigger its  
20 "need to be upgraded" in and of themselves. Rather, the increased loading (in terms of vehicles  
21 and weight of vehicles) will bring sooner the day when the interchange will need to be rebuilt. A  
22 secondary and cumulative impact (rather than a primary impact) in our opinion, and we have no  
23 funded plans for that construction.  
24

25 **Response:** The following text changes have been made in Section 3.10.1 of the EIS in  
26 response to this comment:  
27

- 28 • The reference to the lane width has been omitted.
- 29 • The text has been corrected to reflect the 65 mph speed limit.
- 30 • The text has been modified to clarify that the need for upgrade of the junction of US 20  
31 and I-15 may be accelerated by, but would not be the direct result of, additional traffic to  
32 and from the proposed EREF.
- 33 • Text has been added to note that there are no funded plans for this construction.  
34  
35

36 **Comment:** The following comment addresses the adequate capacity of the road (US 20) to  
37 handle the flow of traffic during construction and operation of the proposed EREF.  
38

39 **[152-12, Steven Serr]** There were three items in the EIS that I'd like to address. They noted in  
40 here, a small to moderate impact on traffic conditions. We have discussed with AREVA the  
41 issues on traffic. They've been working with the Transportation Department. The road that is  
42 constructed out there has adequate capacity to handle any of the traffic flow, increased traffic  
43 flows that would be created by the construction and operations over the long-term operation of  
44 the facility. They're well within the traffic design standards, even with that increased traffic flow  
45 on it. They are in the process of construction an overpass in their plans to access this site. With  
46 that construction, we fell that it would not be a traffic flow impediment with approaching cars  
47 coming in or out of the facility, or truck traffic.  
48

1 **Response:** *The NRC acknowledges this comment and appreciates the participation in the*  
2 *NEPA process Please note that, as acknowledged in the response to Comment 142-01 from*  
3 *Mr. Blake Rindlisbacher of the ITD, plans for access to US 20 have not been finalized and*  
4 *construction has not yet begun.*

5  
6  
7 **Comment:** The following comment discusses the waste classification of depleted uranium by  
8 the State of Tennessee and its relation to the handling, storage, and transport of UF<sub>6</sub>.

9  
10 **[181-20, Roger Turner]** NEPA requires a hard look at environmental impacts even if waste  
11 classification system is flawed....

12  
13 Because depleted uranium has been evaluated by the State of Tennessee as a “solid waste” as  
14 defined by RCRA, and because uranium hexafluoride is toxic, the EIS must examine more  
15 closely the handling, storage, and transport of UF<sub>6</sub> including the environmental impacts, both  
16 cumulative and indirect from the project at Areva, regardless of the “official” classification of it as  
17 “Low-Level”, or Low Level Mixed waste.

18  
19 **Response:** *Classification of waste by the State of Tennessee has no bearing on the handling,*  
20 *storage, and transport of wastes generated at the proposed EREF. Impacts from the handling,*  
21 *storage, transportation, and disposal of radioactive wastes, including depleted UF<sub>6</sub>, are*  
22 *addressed in Sections 4.2.9, 4.2.10, 4.2.11, and Appendix D of the EIS.*

23  
24  
25 **Comment:** The following comment asserts that the risks of accidents associated with the  
26 transportation of radioactive materials to and from the proposed EREF site should require the  
27 NRC to notify all relevant regional offices when radioactive material will be shipped.

28  
29 **[191-16, Liz Woodruff]** Accidents. The risks of accidents associated with the transportation of  
30 radioactive materials into and out of the site should require the Nuclear Regulatory Commission  
31 to notify all relevant regional offices when radioactive material will be shipped to and from the  
32 Areva facility.

33  
34 **Response:** *Per 10 CFR 71.97, such notifications would not be required for the shipment of UF<sub>6</sub>*  
35 *or other radioactive materials and wastes that would be transported to or from the proposed*  
36 *EREF.*

37  
38  
39 **Comment:** The following comment relates to risks associated with radioactive materials.

40  
41 **[191-06, Liz Woodruff]** Radioactive Waste Poses an Unacceptable Risk. Radioactive material  
42 is inherently dangerous. Just the activities directly connected with uranium enrichment pose  
43 risks, as do all other parts of the fuel chain. The NRC should perform a complete analysis of the  
44 risks of uranium mining and milling, mixing yellow cake with hexafluoride (itself a dangerous  
45 material), enriching UF<sub>6</sub> in gas centrifuge plants, storing and deconverting depleted UF<sub>6</sub>,  
46 disposing of depleted uranium and low level waste, fabricating fuel from enriched uranium, and  
47 all intermediate transportation steps.

1 **Response:** *The public health impacts from the transportation of radioactive and nonradioactive*  
2 *materials to and from the proposed EREF, including radioactive waste and depleted UF<sub>6</sub>, are*  
3 *addressed in Section 4.2.9 and Appendix D of the EIS. Public health impacts from incident-free*  
4 *transportation of materials to and from the facility would be SMALL, and public health impacts*  
5 *from transportation accidents would also be SMALL. The risks posed by other activities in the*  
6 *uranium fuel cycle (e.g., mining and milling) are not within the scope of this EIS, which is for the*  
7 *proposed EREF.*

8  
9  
10 **Comment:** The following comment relates to the shipment of radioactive materials to and  
11 through the State of Idaho and the storage of such materials in Idaho.

12  
13 **[147-05, Joey Schueler]** 1. Nuclear compounds will be shipped to Idaho and the byproduct  
14 waste of the process as well as enriched Uranium will be either shipped through our state or  
15 stored in Idaho.

16  
17 **Response:** *As discussed in Section 4.2.11 of the EIS, low level radioactive waste from*  
18 *operation of the proposed EREF would be transported to licensed TSDFs. No radioactive waste*  
19 *would be transported into Idaho as a result of the proposed EREF project. The only radioactive*  
20 *materials transported to the proposed EREF would be UF<sub>6</sub> feed for the enrichment process.*

21  
22  
23 **Comment:** The following comments contend that radioactive materials are already transported  
24 safely across Idaho.

25  
26 **[133-08, Richard Provencher]** Last, the transportation corridor in this area is robust and has  
27 been used successfully by other regional nuclear operators to safely transport large amounts of  
28 radioactive materials without incident. This existing infrastructure has also prepared local  
29 communities along transportation routes to respond to incidents should they occur making them  
30 well prepared.

31  
32 **[157-08, Hon. Erik Simpson]** Transportation of radioactive materials. Concern was raised in  
33 western Idaho over the transportation of uranium hexafluoride and enriched uranium across  
34 Idaho's highways. Radioactive materials are already transported across Idaho several times a  
35 week. In fact, Idaho National Laboratory contractors have shipped more than 40,000 cubic  
36 meters of low-level and transuranic waste safely across Idaho to out-of-state facilities during the  
37 last decade.

38  
39 **Response:** *The NRC acknowledges these comments.*

40  
41  
42 **Comment:** The following comments concern the cleanup costs for transportation accidents.

43  
44 **[049-02, Victoria Everett]** And also, in the case of an accident, who plays for the cleanup?  
45 Who's responsible for that? The State of Idaho? Or is it AREVA? You know, that wasn't  
46 clarified. And in transportation, a truck gets in a wreck, it spills all over the ground. You know,  
47 such cases as that. Say there is a fire, and there's a major disaster at the plant. Who pays for  
48 that?

1 **[181-08, Roger Turner]** It would be opposed because the project would transport  
2 approximately 2,000 trucks of radioactive material across the state highways with no financial  
3 support dedicated, and provided to this state for safety, or for cleanup.  
4

5 **Response:** *In general, cleanup and the costs of cleanup of radioactive material from accidents*  
6 *involving the transportation of materials to and from the proposed EREF, or any other industrial*  
7 *facility in the State of Idaho or elsewhere in the U.S., would be the responsibility of the carrier*  
8 *and potentially the responsible facility (shipper or receiver, as would be pre-determined for each*  
9 *shipment). The IDEQ, in cooperation with the ITD and local authorities (e.g., law enforcement*  
10 *and the fire department), would be involved in emergency response and cleanup oversight.*  
11

12  
13 **Comment:** The following comments suggest that transportation risks and accidents, including  
14 emergency response, are not covered in the Draft EIS.  
15

16 **[025-02, Hon. Sue Chew]** So, you know, when I look at the fact that we have an aquifer, and  
17 we have potential waste that would be created upstream, I want to make sure that we have a  
18 good plan there when we look at transportation into Idaho and out, that those things are  
19 considered.  
20

21 **[027-03, Sara Cohn]** And finally, we are concerned with the transportation analysis in the draft  
22 EIS, that it does not appropriately account for the hazardous and radioactive materials that will  
23 be transported to and from the site. Analyzing traffic impacts alone does not adequately  
24 encompass the potential impacts to public health, and the environment, associated with such  
25 cargo. Perhaps that will be addressed in the safety analysis. I have not yet seen that. I don't  
26 believe it's been out for public comment.  
27

28 **[027-07, Sara Cohn]** Transportation: The ICL is very concerned about the transportation of  
29 hazardous and toxic materials to and from the project site. Based on the size of the facility and  
30 the number of trips expected to transport hazardous and toxic materials, the possibility of  
31 accidental spills and subsequent contamination is high. Transportation risk analysis should be  
32 provided within the final EIS to ensure that the transport of hazardous materials to and from the  
33 site will not result in the pollution of Idaho's waters and air, or endanger public health. More  
34 information is needed to understand the size and scale of the enrichment facility, the amount of  
35 waste produced and transported from the site, and the amount of hazardous and toxic materials  
36 imported and exported from the site. We also request information regarding the methods of  
37 transport and the types of containment vessels that will be used to transport materials.  
38

39 Detailed plans should be prepared to reduce contamination and public health risks in the event  
40 of a spill or accident during transport.  
41

42 **[050-02 Joanie Fauci]** One of the areas I feel is under-emphasized in the DEIS is the Safety  
43 issue.

44 • There will always be safety issues with transportation, even of non-toxic substances. Nuclear  
45 material (uranium) involves additional safety measures for transport and possible emergency  
46 response.  
47

1 [068-03, Anne Hausrath] I am opposed to the transport of radioactive waste. I believe this risk  
2 has not been addressed.

3  
4 [105-04, Eve McConaughey] The most glaring question, not addressed or answered  
5 concerned the transportation risks and ultimate unresolved problem of waste disposal.

6  
7 [136-01, Susan Rainey] No uranium enrichment facility outside Id Falls by AREVA!!! The  
8 transport of radioactive material and the storage of nuclear waste are my biggest concerns.  
9 There are safety issues! We will be at risk. How will the waste be disposed of? Snake River  
10 Alliance did an excellent job explaining. NRC sounded like bureaucratic babble ignoring the real  
11 dangers and concerns. How is this really going to help us here in Idaho, USA? Let's look at  
12 other options. Not worth the risk.

13  
14 [153-08, Andrea Shipley; 197-08, Andrea Shipley, on behalf of the Snake River Alliance;  
15 184-11, Kitty Vincent] Accidents happen and there are risks associated with the transportation  
16 of radioactive materials. The EIS should fully evaluate the safety threats posed by the  
17 transportation of radioactive material into and out of the EREF. The accident scenarios should  
18 include an analysis of the potential environmental and public health effects of an accident on  
19 roadways in the event of a spill of the various radioactive materials that will be transported to  
20 and from the facility.

21  
22 [169-02, Margaret Stewart] And there has been inadequate addressing in the EIS of wildfire  
23 threats, and transportation of nuclear material accidents.

24  
25 [191-31, Liz Woodruff] Transportation. The EIS should fully evaluate the safety threats posed  
26 by the transportation of radioactive material into and out of the EREF. The accident scenarios  
27 should include an analysis of the potential environmental and public health effects of an  
28 accident on roadways in the event of a spill of the various radioactive materials that will be  
29 transported to and from the facility: uranium hexafluoride; enriched uranium, and depleted  
30 uranium.

31  
32 [192-16, Lisa Young] Indeed, I hope to see further examination of accident scenarios involving  
33 large wildfires around the facility, as well as accident scenarios involving the transportation of  
34 radioactive substances to and from the facility on our roads and highways.

35  
36 **Response:** *The public health impacts from the transportation of radioactive and nonradioactive*  
37 *materials, including the release of radioactive materials and other chemicals following a*  
38 *transportation accident severe enough to rupture a cargo container, are addressed in*  
39 *Section 4.2.9 and Appendix D of the EIS. Public health impacts from incident-free*  
40 *transportation of materials to and from the facility would be SMALL, and public health impacts*  
41 *from transportation accidents would also be SMALL.*

42  
43 *The transportation of radioactive cargo is subject to both DOT and NRC shipping regulations as*  
44 *discussed in Section D.3 of the EIS. Safety measures in the regulations include the proper*  
45 *packaging of the material for shipment. Information about the containers that would be used to*  
46 *transport radioactive cargo is included in Section D.3.2.*



1 *Emergency response plans for transportation accidents are not within the scope of the EIS, but*  
2 *are addressed in the SER (NRC, 2010b). Cleanup for accidents involving the transportation of*  
3 *materials to and from the proposed EREF, or any other industrial facility in the United States,*  
4 *would be handled by the carrier, the responsible facility (shipper or receiver), and the*  
5 *appropriate Federal, State, and local agencies.*  
6  
7

#### 8 **I.5.17 Public and Occupational Health**

9

10 **Comment:** The following comment requests information related to the exposure of the public to  
11 toxic, radioactive, and/or harmful pollutants from operation of the proposed EREF.  
12

13 **[027-18, Sara Cohn]** Public Health. The ICL is concerned that operation of this facility may  
14 expose Idahoans to toxic, radioactive, and/or harmful pollutants. Further detail and analysis  
15 must investigate risks associated with water and air contamination from enrichment operations.  
16 We request detailed information regarding the amounts and types of materials used, produced,  
17 and stored onsite. We would like detailed information about how these materials may be  
18 released and how releases may endanger public health. Detailed plans to contain releases as  
19 well as alert and protect the public will be essential in the final EIS. Additionally, further analysis  
20 must ensure no air releases during transportation of both uranium product and waste to and  
21 from the site. The health of Idahoans is of primary import and should not be compromised by  
22 enrichment product, waste, or transport.  
23

24 **Response:** *The NRC staff believes that the EIS presents sufficient detail on the potential*  
25 *impacts of exposures to toxic substances from proposed EREF operations. As reported in*  
26 *Chapter 6 of the SER, NUREG-1951 (NRC, 2010b), UF<sub>6</sub> is the only chemical of concern with*  
27 *regard to potential occupational or public health exposures that will be used at the proposed*  
28 *EREF due to exposures to HF and uranium compounds produced in the interaction of UF<sub>6</sub> with*  
29 *moisture. As shown in Section 4.2.10.2 and Appendix E, the EIS analyzes potential exposures*  
30 *of members of the public to these substances via the air pathway during the proposed EREF*  
31 *operations. The analysis shows that such exposures would be below regulatory limits and*  
32 *would not harm members of the public. There would be no exposures to any toxic substances*  
33 *by way of any water pathway; the facility would have no offsite waterborne effluent streams, as*  
34 *discussed in Sections 2.1.4.2 and 4.2.6.2. Section D.3.2 in Appendix D discusses the*  
35 *packaging requirements which preclude any releases of material during routine transportation*  
36 *operations.*  
37  
38

39 **Comment:** The following comment asks why the ALARA (As Low As Reasonably Achievable)  
40 constraint on air emissions of radioactive material to the environment is not addressed in the  
41 EIS.  
42

43 **[066-08, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 6.  
44 Several places in the draft EIS reference the 100 millirem per year dose limit to any member of  
45 the public. The draft EIS does not discuss the ALARA constraint on air emissions of radioactive  
46 material to the environment of 10 millirem per year as stated in 10 CFR 20.1101(d). Please  
47 explain why this is not addressed.  
48

1 **Response:** A comparison of estimated doses associated with air emissions to the limits in  
2 10 CFR 20.1101 has been added to Section 4.2.10.2.

3  
4  
5 **Comment:** The following comment questions the NRC's use of the high-pressure ion chamber  
6 (HPIC) exposure in air measurement to derive a hypothetical soil concentration.

7  
8 **[066-09, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 7.  
9 Chapter 3: pp. 3-83 Line 12 discusses an average HPIC exposure rate in units of curie per  
10 kilogram with micro roentgen per hour in parenthesis and cites IDEQ INL Oversight Program  
11 (2008). The IDEQ INL Oversight Program only reports HPIC results in units of exposure per  
12 hour (micro roentgen per hour). Activity per unit mass is typical of a soil concentration  
13 measurement. If NRC has somehow used the HPIC exposure in air measurement to derive a  
14 hypothetical soil concentration, they need to subtract the contribution from cosmic sources from  
15 this measurement. Either way, the reference to IDEQ INL Oversight Program should only  
16 include the micro roentgen per hour units and any inferences should be clearly stated.

17  
18 **Response:** Section 3.11 of the EIS has been revised. The concentration units have been  
19 corrected and changed from curie (Ci) per kilogram to coulomb (C) per kilogram

20  
21  
22 **Comment:** The following comment requests evaluation of potential elevated releases from the  
23 proposed EREF that would result in higher impacts than the ground level releases evaluated in  
24 the Draft EIS.

25  
26 **[066-19, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 17.  
27 Appendix E: pp. E-7, Line 45 through pp. E-8 Line 3 states "Since the exact height layout of the  
28 release points was not available and the CAP88-PC computer code does not account for  
29 building wake effects, releases were assumed to take place at ground level. Ground-level  
30 releases result in larger concentrations of radionuclides in air for receptors near the source than  
31 do elevated releases." This statement is true and is more conservative for hypothetical public at  
32 the fence, but underestimates the dose to the nearest actual resident which is 8 km (5 mi) away.  
33 Additionally, pp. 6-16 lines 14-17 state an approximate elevation of 40 meters (132 feet) for the  
34 effluent emission points. This approximation could be used to run the CAP88-PC code. DEQ  
35 requests clarification in the EIS and evaluation of this potential impact.

36  
37 **Response:** The CAP-88-PC computer code was run for both ground level and 40-meter (m)  
38 releases. For conservatism, the maximum values of the two runs were chosen for the dose  
39 estimate. For the nearest resident, the maximum dose was associated with the ground level  
40 release, while the maximum population dose was associated with the 40-m release. The text  
41 and tables in Section 4.2.10.2 and Appendix E in the EIS have been modified to reflect these  
42 changes.

43  
44  
45 **Comment:** The following comment expresses concerns about worker safety at the proposed  
46 EREF and the need for safety procedures in general.

1 **[036-02, Christina Cutler, on behalf of the Shoshone-Bannock Tribes]** Safety procedures,  
2 protecting human health and the environment, for the storage facility as well as the processing  
3 facility need to make clear. Including but not limited to worker safety. Worker safety is always a  
4 concern and should be thoroughly characterized and described in the proposal.  
5

6 **Response:** *The proposed EREF would operate under a facility Health and Safety Plan*  
7 *administered by a Health and Safety Organization that would implement the health and safety*  
8 *requirements of the NRC and U.S. Occupational Safety and Health Administration (OSHA), as*  
9 *specified in the relevant portions of 10 CFR 20 and 29 CFR 1910, respectively, cited in*  
10 *Section 4.2.10 of the EIS. Procedures in the Emergency Plan for the proposed EREF would be*  
11 *designed to protect workers under emergency conditions.*  
12

13  
14 **Comment:** The comment suggests that impacts to the public from air releases would be small.  
15

16 **[133-04, Richard Provencher]** There appears to be only a small amount of air discharge of  
17 radioactivity which results in virtually no impact to the nearest public receptor.  
18

19 **Response:** *The NRC acknowledges the comment and appreciates the public participation.*  
20

21  
22 **Comment:** The following comment expresses a concern that impacts from fluoride exposure  
23 could be underestimated.  
24

25 **[141-03, Peter Rickards]** The SENES fluoride documents on underestimating fluoride impact  
26 at Oak Ridge was not answered, despite acknowledging “someone” asked about it. The SENES  
27 team does work for CDC, and underestimating the fluoride is unacceptable.  
28

29 **Response:** *The SENES Oak Ridge Inc. fluoride documents concern releases of tens of*  
30 *thousands of pounds of HF on an annual basis and are not directly applicable to the proposed*  
31 *EREF. This is because HF releases from the proposed EREF are estimated to be less than*  
32 *4.4 pounds per year, as stated in Section 4.2.10.2 of the EIS, a difference of about 1000 to*  
33 *10,000 times less than those considered at Oak Ridge, resulting in much lower environmental*  
34 *concentration levels than considered harmful in the SENES documents. Section 4.2.10.2 of the*  
35 *EIS discusses the potential air concentrations of HF for workers and the public as a result of the*  
36 *proposed EREF. For workers, the potential estimated concentrations would all be below OSHA*  
37 *and National Institute for Occupational Safety and Health (NIOSH) standards. For members of*  
38 *the public, estimated concentrations would be about 1000 times below State of Idaho*  
39 *regulations.*  
40

41  
42 **Comment:** The following comment expresses concerns regarding risks due to uranium  
43 materials due to the preconstruction exemption granted to AES by the NRC.  
44

45 **[147-07, Joey Schueler]** 3. Contamination potentials are not being discussed or considered in  
46 the environmental impact assessment process due to “exemptions” and were missing from the  
47 public comment phase of the assessment and when asked to speak directly to this point by  
48 myself, NRC / EIS representatives refused to comment. Yet, the NRC website acknowledges

1 that risks exist for this plant: “Hazards: The primary hazard in gaseous diffusion plants include  
2 the chemical and radiological hazard of a UF<sub>6</sub> release and the potential for mishandling the  
3 enriched uranium, which could create a criticality accident (inadvertent nuclear chain reaction).  
4 Sited source: <http://www.nrc.gov/materials/fuel-cycle-fac/ur-enrichment.html>  
5

6 **Response:** AES would not be authorized to handle, store, or process uranium materials at the  
7 proposed EREF until a license is granted by the NRC. The exemption to which this comment  
8 refers allows preconstruction activities to be conducted by AES, such as site preparation  
9 activities, before the license is granted, as discussed in Section 1.4.1 of the EIS; however, those  
10 activities do not involve uranium materials. Therefore, there are no risks due to uranium  
11 compounds associated with the preconstruction exemption. Risks associated with UF<sub>6</sub> at the  
12 proposed facility, including those from operations, accidents, and potential terrorist acts, are  
13 covered in Sections 4.2.10, 4.2.15, and 4.2.18.  
14  
15

16 **Comment:** The following comment points out that enriched uranium is more hazardous than  
17 depleted uranium.  
18

19 **[147-13, Joey Schueler]** 9. Enriched Uranium is far more hazardous than the “Depleted  
20 Uranium” used in Gulf military operations, even though many Desert Storm veterans fell prey to  
21 cancer after their exposure to depleted Uranium in clearing bombed Iraqi vehicles, strongholds  
22 and implements of war, deemed “safe” by our military leaders (sound familiar?).  
23 [http://en.wikipedia.org/wiki/Gulf\\_War#Effects\\_of\\_depleted\\_uranium](http://en.wikipedia.org/wiki/Gulf_War#Effects_of_depleted_uranium)  
24

25 **Response:** The EIS evaluates the potential doses to workers and members of the public  
26 associated with UF<sub>6</sub> in storage and uranium releases associated with normal operations  
27 (see Section 4.2.10), finding that the impacts would be SMALL.  
28  
29

30 **Comment:** The following comment states that the public health risks of temporary storage of  
31 depleted uranium should be addressed in the EIS.  
32

33 **[181-11, Roger Turner]** Public Health risks of “Temporary” Storage of depleted Uranium  
34 should be addressed in EIS. The draft EIS by the NRC significantly errs by minimizing the  
35 human health and environmental risks in the risks of the storage of uranium in above-ground  
36 pads in eastern Idaho. The EIS is flawed in its apparent assumption that another location will be  
37 certified for off-site storage. The EIS fails to acknowledge that these casks may be breached by  
38 handling or corrosion. Here is an excerpt of the EIS, under the Public Health section:  
39

40 During peak operation, the proposed EREF is expected to generate 1222 cylinders of  
41 depleted UF<sub>6</sub> annually, which would be temporarily stored on an outdoor cylinder  
42 storage pad in approved Type 48Y containers before being transported to a DOE-owned  
43 or private conversion facility.  
44

45 The above paragraph, under the Public Health Section, in fact, does not even discuss public  
46 health. The EIS must assume that the casks of depleted Uranium will remain for some time at  
47 the site, as the treatment facility to convert UF<sub>6</sub> to the more stable oxide is behind in schedules  
48 and experiencing budget problems affecting production. Anytime heavy equipment is operated

1 there is a risk that accidents will occur. In fact, casks of UF<sub>6</sub> were damaged by heavy  
2 equipment at Oak Ridge, so the risk to workers and public health is real. The EIS needs to  
3 define “temporary” and fully assess health and worker risks, for longer term storage at the  
4 site....

5  
6 The characteristics of UF<sub>6</sub> pose potential health and environmental risks. DUF<sub>6</sub> in cylinders  
7 emits low levels of gamma and neutron radiation. Also, when released to the atmosphere, DUF<sub>6</sub>  
8 reacts with water vapor in the air to form hydrogen fluoride (HF) and uranyl fluoride (UO<sub>2</sub>F<sub>2</sub>),  
9 both chemically toxic substances. Consequently, spills and air releases of this material is  
10 potentially a significant adverse impact on the environment as defined by NEPA.

11  
12 **Response:** *The EIS considers the dose to workers and the public associated with stored UF<sub>6</sub>*  
13 *cylinders in Section 4.2.10.2. The cylinder management program to minimize cylinder corrosion*  
14 *is covered in Section 4.2.11.2. Accidents with potential impacts that bound those involving*  
15 *heavy equipment and full cylinders are analyzed in Section 4.2.15. The consequences of the*  
16 *accidents analyzed encompass those of a storage pad cylinder release.*

17  
18  
19 **Comment:** The following comment requests that information be added to the EIS regarding  
20 certain filtering and ventilation systems and the associated risks that would be part of the  
21 proposed EREF.

22  
23 **[181-16, Roger Turner]** Inadequate description and risk evaluation of the first step in the  
24 process. Sublimation of the solid UF<sub>6</sub> into the gas phase. How is this done? What is the size of  
25 facility to accomplish this? What temperatures and pressures are required to sublime UF<sub>6</sub>?  
26 The EIS describes, on page 2-19 a system of pre-filters before the “cleaned gases would be  
27 discharged to the atmosphere via rooftop stacks”. The EIS needs to describe this system and  
28 how it functions. What systems would be in place to monitor these filters and their integrity?  
29 What are the “clean gases” that will be discharged to the atmosphere and how are these gases  
30 monitored? Are continuous stack samplers employed for this? Please describe them in the EIS.  
31 What is the annual volume of gas produced and what are the safeguards?

32  
33 The Section on SBM notes that a ventilation system will be in place: “The Gaseous Effluent  
34 Ventilation System would be used to remove uranium and other radioactive particles and  
35 hydrogen fluoride from the potentially contaminated process gas streams.”

36  
37 The final EIS needs to go into some detail about the ventilation system. If there is a release of  
38 UF<sub>6</sub>, or HF, how does the ventilation system capture it? Once captured how is it specifically  
39 treated and how does it provide protection to the workers and protection from release into the  
40 atmosphere, or in the case of liquid or solid phases of it, protection from contact to workers?

41  
42 **Response:** *Presentation of detailed information regarding the sublimation process and the*  
43 *ventilation system of the EREF is beyond the scope of this EIS. However, Section 4.2.10.2 of*  
44 *the EIS discusses the doses associated with the potential routine airborne release of uranium*  
45 *from the proposed EREF; Section 4.2.15.2 discusses accident impacts including the rupture of a*  
46 *Centrifuge Test Facility feed vessel; Section 4.2.15.3 discusses mitigation measures in place to*  
47 *prevent this accident; and Section 5.2, Table 5-2, identifies mitigation measures associated with*  
48 *the release of UF<sub>6</sub> and related compounds during operations. Sections 6.1.1 and 6.1.2 discuss*  
49 *ambient air monitoring activities and reporting requirements.*



1 **Comment:** The following comments raise the issue of thyroid cancer in Elmore County and  
2 state that this risk needs to be addressed in the EIS.

3  
4 **[016-02, Manley Briggs]** However, a really interesting thing that I noticed was that Elmore  
5 County had a statistically increased rate of thyroid cancer in those born after 1958. That means  
6 they weren't affected by the nuclear bomb tests. But why do they have it? And it is pertinent, I  
7 think, at least needs to be looked into, that Elmore County is the first county down-river from the  
8 discharge of the Snake River aquifer at the Thousand Springs into the Snake River. So I think  
9 that at least needs to be addressed by the Environmental Impact Statement.

10  
11 **[016-04, Manley Briggs]** One last observation that I would like to point out is the high  
12 incidence of thyroid cancer in Elmore County. Elmore is the first county below the Thousand  
13 Springs, which is where the Snake River Aquifer empties into the Snake River. This was noted  
14 in the 1999 NCI Report regarding the Nuclear-Bomb test fallout. This increased incidence  
15 occurred only in individuals born after 1958 and thus could not be attributed to the Bomb fallout.  
16 Could it be due to leaching of radioactivity into the aquifer from previously stored nuclear  
17 materials? This would certainly have bearing on Areva's proposal, and should be examined by  
18 the Areva EIS.

19  
20 **Response:** *Increased thyroid cancer rates are associated with exposure to radioactive iodine*  
21 *produced in nuclear fission, the characteristic chain reaction that occurs in a nuclear reactor or a*  
22 *nuclear bomb. Thyroid cancer rates are not an issue related to the proposed EREF because*  
23 *operations at the proposed EREF would not involve nuclear fission and would not produce*  
24 *radioactive iodine. For reasons discussed in Section 4.2.6.2 of the EIS, operation of the*  
25 *proposed EREF would not contaminate the Snake River Aquifer.*

26  
27  
28 **Comment:** The following comments express concern regarding the exposure risks as a result of  
29 the proposed EREF.

30  
31 **[147-01, Joey Schueler]** This is a very serious decision that we've entrusted to a very few  
32 people, and I'm not convinced from this meeting -- cause you're convincing us as much as we're  
33 trying to convince you tonight, right? I'm not very convinced that this is unbiased.

34  
35 I'm extremely concerned about that, and the implications just are dire to me. And I have to ask:  
36 What is the risk? Not the impact. What is the risk?

37  
38 I've heard a lot of statements about what the impact is. And the economic impact is, yes, I'm  
39 sure tremendous, and I think she put it well, that there's a dollar sign to this. But I'm not here to  
40 hear about impact, whether it be pro or against. I want to know what the risk is to me and my  
41 family, because that's what this is about. I know there's many environmental factors, but I think  
42 if there's one thing we should be concerned about in Idaho, is our safety.

43  
44 **[147-03, Joey Schueler]** I do not feel that any summary statement on impact of nuclear  
45 enriched uranium plant that does not account for any statement on the potential risk of exposure  
46 is a sound or unbiased summation on environmental impact. This concerns me greatly and  
47 presents a basic failure on the part of the NRC, whether unintentional or planned.

1 **Response:** *In the EIS, the NRC staff analyzes the environmental impacts associated with the*  
2 *construction, operation, and decommissioning of the proposed EREF. As part of its analysis,*  
3 *the staff has considered the impacts – both positive and negative – that the proposed EREF*  
4 *may have on members of the public. Further, the staff has considered how members of the*  
5 *public may be affected by the proposed EREF both during normal operations and as a result of*  
6 *certain abnormal events. The impacts that the staff analyzed in detail are listed in Section 1.4.3*  
7 *of the EIS. These impacts include impacts related to public and occupational health, as well as*  
8 *a variety of other impacts potentially affecting the quality of life. In Chapter 4 of the EIS, the*  
9 *NRC staff discusses these impacts in detail. In EIS Sections 2.4 and 2.5, the staff provides a*  
10 *summary of its analysis. Applying the impact scale outlined in Council on Environmental Quality*  
11 *regulations, the staff has determined that all impacts related to the long-term safety of the public*  
12 *would be SMALL.*

13  
14 *In addition to analyzing environmental impacts potentially associated with the EREF, the NRC*  
15 *staff conducted a rigorous safety review of AES's application. The staff conducted its safety*  
16 *review to determine whether AES's application meets NRC regulations designed to protect*  
17 *public health and safety. For example, NRC regulations in 10 CFR Part 20 prescribe radiation*  
18 *dose limits for individual members of the public. The staff has determined that AES's*  
19 *application satisfies all applicable safety-related criteria in NRC regulations. The staff's safety*  
20 *findings are presented in its Safety Evaluation Report.*

21  
22  
23 **Comment:** The following comments discuss increasing radiation from stored depleted UF<sub>6</sub> and  
24 the potential for accidental release.

25  
26 **[032-05, Cindy Cottrell]** The problem with depleted uranium is that it becomes more  
27 radioactive over the course of 1,000,000 years. Where would we store this knowing it will  
28 become more radioactive?

29  
30 **[103-05, Karen McCall]** Depleted uranium becomes more radioactive as it ages leaving an  
31 ever increasing toxic legacy.

32  
33 **[157-02, Hon. Erik Simpson]** Another issue related to the production of depleted uranium, that  
34 has been overstated, to a great extent, deals with the radioactive level of the material over time.  
35 It is true that depleted uranium tails from enrichment become more radioactive. The real  
36 question is whether that presents a problem to anyone's future health and safety of the  
37 environment. We all know that uranium is a naturally occurring radioactive element as found in  
38 nature. Uranium also contains all of the naturally-occurring decay products of the uranium decay  
39 chain.

40  
41 After going through chemical purification and enrichment, the depleted uranium tails are  
42 stripped of those other materials that are actually much less radioactive than the form of  
43 uranium normally found in nature. So it is the build-up of those normal decay products in the  
44 depleted uranium that give reason for the position that it becomes more radioactive, with time.  
45 Truth be told, the uranium is actually building back up to its natural balance of uranium and  
46 decay products. The ultimate question we need to address was storage and disposal of  
47 depleted uranium, is can it be done safely and does this increase in radioactive, back to normal

1 levels, create a future problem for the environment? The answer to that -- uranium can be  
2 very -- or it can be very safely stored and disposed.

3  
4 **[168-03, Lon Stewart]** What does Idaho get out of this? We get highly radioactive waste that  
5 increases in intensity over time, we get a chance to pollute the Eastern Snake River Aquifer, the  
6 main source for water for all of Southeast Idaho and then pollute the Snake River which flows  
7 through the Southwest portion of the state. We will probably get 350,000 tons of uranium waste  
8 over the life of the facility that no one currently knows how to dispose of. And when an accident  
9 occurs, which sooner or later it will, how many people will be affected? Doesn't sound good to  
10 me.

11  
12 **[171-06, John Tanner]** As far as disposal of decayed uranium is concerned, an honest  
13 comparison of the radioactivity between depleted uranium and uranium ore would compare  
14 equal amounts of uranium, not equal amounts of dirt. And on that basis, ore is far more  
15 radioactive than depleted uranium. It's simply that in the depleted uranium, they've concentrated  
16 the uranium, and it would make no sense to dilute it by mixing it with dirt just so we can say well  
17 now it's ore. It should be buried, as is, and shallow, because some day we're going to need it.

18  
19 **[180-06, Kaye Turner]** Is it true that depleted uranium becomes more radioactive over time?

20  
21 **[193-05, Liz Woodruff, on behalf of the Snake River Alliance]** So once it is deconverted,  
22 after treatment, if they come up with a solution for this, is the problem solved? Well, there is less  
23 of it. But the funny thing about depleted uranium is that it becomes more radioactive. Over time,  
24 as it decomposes, it exposes radon gas. And it's most radioactive in its millionth year.

25  
26 **[192-13, Lisa Young]** The storage of the depleted uranium waste, which will likely not be  
27 deconverted in any reasonable timeline, poses a serious risk to our health and safety as  
28 Idahoans, and to the residents of any other region where the waste will be stored in the future.  
29 Even after proper deconversion of this waste, the remaining waste, which cumulatively becomes  
30 more of a radioactive threat over time, has nowhere to go for acceptable long-term storage, and  
31 will continue to plague our waste storage sites with more and more barrels of poison, creating  
32 more and more of a health and safety risk for the surrounding communities. Producing this  
33 waste is irresponsible, and licensing a facility that will do just that is undeniably irresponsible.

34  
35 **Response:** *While uranium isotopes in depleted UF<sub>6</sub> continue to decay at a constant rate after*  
36 *the enrichment process is complete, daughter products from their decay build up and increase*  
37 *the total radiation emitted from the material, which would be similar to that associated with*  
38 *naturally-occurring uranium ore. For illustrative purposes, the dose rate at 1 meter from a*  
39 *storage cylinder containing 10,000 kg of solid depleted uranium oxide would be expected to*  
40 *increase from 0.26 mrem/hour in the first year to 1 mrem/hour at 10,000 years and*  
41 *30 mrem/hour at 1 million years. As noted in Section 3.11.1 of the EIS, the average person in*  
42 *the United States receives approximately 310 mrem per year from natural background radiation*  
43 *sources.*

44  
45 *Accident scenarios involving stored cylinders of depleted UF<sub>6</sub> at the proposed EREF are*  
46 *encompassed by the accident analysis of more severe accidents presented in Section 4.2.15.2*  
47 *and analyzed in greater detail in the SER (NRC, 2010b). The consequences of the analyzed*  
48 *accidents bound accidents involving stored depleted UF<sub>6</sub> cylinders on the storage pad, including*

1 routine handling scenarios. The NRC staff concludes that through the combination of plant  
2 design, engineered controls, and administrative controls, accidents at the facility pose a low risk  
3 to workers, the environment, and the public.  
4  
5

#### 6 **I.5.18 Waste Management**

7

8 **Comment:** The following comment expresses support for the project and a desire for more  
9 information on the storage and disposal of wastes.  
10

11 **[006-01, Anonymous]** I am supportive of the AREVA project but would like to have heard more  
12 from the NRC on how waste from the process will be stored and ultimately disposed of.  
13

14 **Response:** Storage and management of waste is discussed in Sections 2.1.4.2, 2.1.4.3, and  
15 4.2.11 of the EIS.  
16

17  
18 **Comment:** The following comment concerns the storage of SNF.  
19

20 **[007-02, Arnold Ayers]** You talk about associated with that, another is storage of fuels. People  
21 are worried about storage. Well, I've got tell you, we did the testing on the storage for the spent  
22 fuels that are actually being stored in power plants today, and found no discharges anywhere. If  
23 we can do it for that, I see absolutely no reason why such facilities cannot be developed and  
24 built for AREVA to be able to handle the waste products that they have over an indefinite period  
25 of time.  
26

27 Wait a minute, we're talking waste products. The reality is that that fuel has a very strong  
28 potential under the right circumstances to become more fuel. It's not a waste product, it is  
29 actually a potential energy resource.  
30

31 **Response:** As reflected in the comment, no SNF would be generated or stored at the proposed  
32 EREF. Section 4.2.11.2 of the EIS addresses the disposal of waste that will be generated  
33 during operations at the proposed EREF.  
34  
35

36 **Comment:** The following comment expresses concern that there would be long term storage of  
37 "spent uranium" at the proposed EREF site.  
38

39 **[019-02, George Buehler]** I see this as the narrow end of the wedge to create long term  
40 storage of spent uranium, since the process of establishing a permanent repository for nuclear  
41 waste has been hopelessly grid-locked for decades.  
42

43 **Response:** The United States is still in the process of considering a permanent repository for  
44 high-level waste and SNF. Neither of these waste types would be generated by the proposed  
45 EREF or stored at the EREF site. Furthermore, AES has stated that depleted UF<sub>6</sub> cylinders  
46 would not be stored at the proposed EREF site beyond the licensed lifetime of the facility  
47 (AES, 2010a).  
48  
49

1 **Comment:** The following comment asserts that the Draft EIS does not contain adequate  
2 information regarding hazardous materials existing or proposed for storage at the proposed  
3 EREF site.  
4

5 **[027-19, Sara Cohn]** Hazardous Materials: The EIS does not contain adequate information  
6 regarding hazardous materials existing onsite. Additionally, it is unclear how hazardous  
7 materials will be stored during operation of the proposed project, and as mentioned above, no  
8 adequate rules exist for disposal of such materials. The final EIS must provide detailed  
9 information with regard to any hazardous materials existing or proposed for storage onsite and  
10 any cumulative risk associated with the storage, transport, and use of hazardous materials  
11 during project operations. The final EIS must include a Management Plan for Toxic and  
12 Hazardous Materials. This document should be available for public comment and should  
13 address health and accident risks associated with toxic and hazardous materials onsite as well  
14 as accident prevention and management strategies. This information is incredibly important to  
15 protect the health and lives of emergency responders and communities such as Idaho Falls,  
16 Pocatello, and others that would potentially be harmed by facility operations. The ICL is  
17 concerned that a hazardous materials analysis was not included in the draft EIS and that the  
18 Safety Report for this facility has yet to be released. The Safety Report- an important document  
19 that will evaluate the safety of the proposed facility and potential threats to public health – must  
20 be released for public comment and evaluation before the final EIS is approved and the NRC  
21 seeks a licensing decision.  
22

23 **Response:** *For the purposes of responding to this comment, the NRC staff assumes that the*  
24 *commenter's definition of "hazardous materials" includes hazardous and radioactive raw materials*  
25 *and waste. The public and occupational health impacts of storing radioactive and hazardous*  
26 *materials onsite are addressed in Section 4.2.10.2 of the EIS. The impacts of transportation*  
27 *accidents involving the release of hazardous materials are addressed in Section D.2.2.2, and the*  
28 *impacts of hazardous waste disposal are addressed in Section 4.2.11.2. Specific details about the*  
29 *onsite storage of hazardous materials at the proposed EREF will not be available until the facility*  
30 *design is finalized; and development of plans for management of toxic and hazardous materials*  
31 *and for emergency response is not within the scope of the EIS. The quantities of hazardous*  
32 *materials to be stored onsite are considered sensitive information and were taken into account as*  
33 *part of the safety evaluation in the NRC's SER, NUREG-1951 (NRC, 2010b).*  
34  
35

36 **Comment:** The following comment requests additional detail about waste from the Gaseous  
37 Effluent Ventilation System (GEVS) at the proposed EREF, including the use and disposal of  
38 filters.  
39

40 **[027-14, Sara Cohn]** The environmental documents mention the use of Gaseous Effluent  
41 Ventilation Systems. We are concerned about the waste associated with the ventilation system  
42 and would like more detail with regard to the use and disposal of any filter-like product that may  
43 contain pollutants.  
44

45 **Response:** *The impacts associated with the waste from the GEVS are addressed in*  
46 *Section 4.2.11.2 of the EIS. Additional information about use and disposal of filter-like products*  
47 *used in the GEVS has been added to that section, including the types of filters and the*  
48 *processing of filters after removal from service.*  
49



1 **Comment:** The following comment asks about who will pay for waste storage at the proposed  
2 EREF site and eventual removal.

3  
4 **[050-11, Joanie Fauci]** Who will pay for waste storage and eventual removal?

5  
6 **Response:** *AES is responsible for all costs of preconstruction, construction, operation, and  
7 decommissioning of the proposed EREF, including waste storage and removal.*

8  
9  
10 **Comment:** The following comment expresses concern that the Draft EIS does not evaluate  
11 toxic waste impacts following decommissioning.

12  
13 **[077-03, Larry Hyatt]** The most serious flaw in the EIS for Eagle Rock is that the evaluation of  
14 impacts end at the decommissioning of the facility where as the toxic contaminants of the  
15 enrichment process will be a serious environmental hazard for thousands of generations into the  
16 future. Both the depleted Uranium and the centrifuged product are a poison to humans and the  
17 proposal shows no assured containment of this material nor a method of rendering it safe. You  
18 cannot show adequate stewardship to manage this dangerous byproduct for its life of toxicities.

19  
20 **Response:** *Waste management impacts at the proposed EREF site following the conclusion of  
21 decommissioning are not addressed in the EIS, because residual environmental hazards are  
22 not anticipated. All waste and contaminated materials would be shipped to a licensed disposal  
23 facility. The NRC license, as well as the AES Decommissioning Funding Plan, would require  
24 the decontamination or removal of all materials from the site which prevent release of the facility  
25 and site for unrestricted use as defined in 10 CFR 20.1402 (NRC, 2010b). The NRC staff has  
26 found that AES's plans for financial assurance for decommissioning and AES's plan for  
27 chemical process safety and controls meet the requirements in 10 CFR Part 70 and provide  
28 reasonable assurance that public health and safety and the environment will be protected  
29 (NRC 2010b).*

30  
31 *The long-term impacts of the disposed waste are covered under the licenses (and their  
32 supporting environmental analyses) that have been, and would in the future be, issued to  
33 commercial radioactive waste disposal facilities. These facilities are licensed by the  
34 Commission or designated Agreement States according to the requirements specified at  
35 10 CFR Part 61 or compatible Agreement State regulations. Further, the NRC is currently  
36 engaged in rulemaking to specify a requirement for a site-specific analysis for the disposal of  
37 low-level radioactive wastes, including large quantities of depleted uranium (NRC, 2009). In the  
38 interim, compliance with the performance objectives specified in Part 61, Subpart C, continues  
39 to provide reasonable assurance that low-level radioactive waste can be safely disposed at  
40 licensed facilities. On April 13, 2010, NRC staff summarized existing policy and guidance to  
41 assist Agreement States in making informed decisions regarding compliance with the  
42 performance objectives for land disposal of significant quantities of depleted uranium until a new  
43 regulation is implemented (NRC, 2010a).*

44  
45  
46 **Comment:** The following comment expresses concern regarding the integrity of storage  
47 containers for depleted UF<sub>6</sub>.

1 **[125-01, Holly Paquette]** Having all that been said, I think the perfect picture for me, that  
2 described what my worries are about this, with the storage of the uranium that we saw up there.  
3 Now Representative Simpson from Idaho Falls came up and said -- which actually did not make  
4 me feel better. I think he hoped that that would -- that those rusted containers are actually highly  
5 regulated, checked, and meet all of the standards that are needed to be keeping the people  
6 around it safe. For me, that was a shock, that that's considered perfectly regulated, and I think  
7 that that brought to mind what's going on in the Gulf right now. We have a lot of trust in our  
8 government, that they are regulating things, and that things are perfectly okay. If that means  
9 that depleted uranium is being stored in rusted metal containers, that we have no way of getting  
10 rid of, that frightens me.

11  
12 **Response:** *As noted in Section 4.2.11.2 of the EIS, DOE has stored depleted UF<sub>6</sub> in Type 48Y*  
13 *or similar cylinders outdoors since the mid-1950s, and cylinder leaks due to corrosion led DOE*  
14 *to implement a cylinder management program. Proper and active depleted UF<sub>6</sub> cylinder*  
15 *management, which includes routine inspections and maintaining the anticorrosion layer on the*  
16 *cylinder surface, has been shown to limit exterior corrosion or mechanical damage and provide*  
17 *for safe storage. AES has committed to the implementation of a similar cylinder management*  
18 *program (see Section 4.2.11.3 of the EIS), which would help ensure safe storage of depleted*  
19 *uranium at the proposed EREF site.*

20  
21  
22 **Comment:** The following comment concerns the transport of radioactive materials and waste  
23 through Idaho and the storage of these materials in the State.

24  
25 **[147-05, Joe Schueler]** 1. Nuclear compounds will be shipped to Idaho and the byproduct  
26 waste of the process as well as enriched Uranium will be either shipped through our state or  
27 stored in Idaho.

28  
29 **Response:** *As discussed in Section 4.2.11 of the EIS, low-level radioactive waste from*  
30 *operation of the proposed EREF would be transported from the proposed EREF site to licensed,*  
31 *out-of-state TSDFs. Depleted UF<sub>6</sub> from the enrichment process would be stored at the*  
32 *proposed EREF site until shipment to a DOE-owned or commercial conversion facility. AES has*  
33 *stated that depleted UF<sub>6</sub> cylinders would not be stored at the proposed EREF site beyond the*  
34 *licensed lifetime of the facility (AES, 2010a).*

35  
36 *No radioactive waste would be transported into Idaho as a result of the proposed EREF project.*  
37 *The only radioactive materials transported to the proposed EREF would be UF<sub>6</sub> feed for the*  
38 *enrichment process.*

39  
40  
41 **Comment:** The following comment discusses potential uses for depleted uranium tails.

42  
43 **[157-04, Hon. Erik Simpson]** Lastly, depleted uranium tails themselves are not considered  
44 waste. The tails contain residual value in both the remaining uranium and fluorine that it  
45 contains. In fact, the Idaho Company, International Isotopes, is in the process of licensing and  
46 building a \$100 million facility in New Mexico specifically designed for the chemical  
47 deconversion of depleted uranium from enrichment. The facility will extract the valuable fluoride  
48 and sell that on the commercial market place.

1 **Response:** As stated in the text box in Section 2.1.5 of the EIS, depleted uranium is source  
2 material as defined in 10 CFR Part 40, and, if treated as a waste, falls under the definition of  
3 low-level radioactive waste per 10 CFR 61.2. After conversion from hexafluoride to a more  
4 stable oxide form, the depleted uranium could potentially be used in various materials or  
5 products. However, DOE currently plans to dispose of most of the depleted uranium oxide as  
6 low-level radioactive waste (DOE, 2009). Should any depleted uranium generated at the  
7 proposed EREF be sent to the proposed International Isotopes facility in the future, the fluoride  
8 in the depleted UF<sub>6</sub> would be recovered and sold on the commercial market.  
9

10  
11 **Comment:** The following comment ask about depleted uranium generation as a result of  
12 enriched uranium production.  
13

14 **[180-05, Kay Turner]** Is it true that for every ton of enriched uranium produced there will be  
15 seven tons of depleted uranium?  
16

17 **Response:** On an annual basis at full production, the proposed EREF is anticipated to produce  
18 approximately 2252 metric tons (2482 tons) of low-enriched UF<sub>6</sub> and 15,270 metric tons  
19 (16,832 tons) of depleted UF<sub>6</sub> as stated in Section 2.1.4.2. The resulting ratio between the  
20 enriched product and depleted tails is about 1.0 to 6.8 or about 1 to 7.  
21  
22

23 **Comment:** The following comment criticizes the classification system for radioactive wastes  
24 and states that the EIS should evaluate risks to the public from radioactive wastes.  
25

26 **[181-19, Roger Turner]** NEPA requires a hard look at environmental impacts even if waste  
27 classification system is flawed. Classification of radioactive wastes in the U.S. errs because  
28 waste categories are based on the origin of the waste, not on the physical, chemical, or  
29 radiological properties that determine the hazards of the waste, and hence its safe and proper  
30 management. Hence the system does not take into account actual radioactivity levels of waste  
31 either overall or per unit volume. Thus, so-called “low-level waste” can contain materials more  
32 radioactive than those classified as “high-level waste.” However, the NEPA requires that risks to  
33 the public be evaluated, in addition to simply repeating the waste classification system  
34 employed in the U.S.  
35

36 **Response:** Discussion of the waste classification established by the NRC in 10 CFR Part 61 is  
37 not within the scope of the EIS. Section 4.2.10 of the EIS presents the evaluation of the  
38 radiological risks to workers and the public as a result of the proposed EREF.  
39  
40

41 **Comment:** The following comment states that the Draft EIS fails to recognize UF<sub>6</sub> as a  
42 Resource Conservation and Recovery Act (RCRA)-permitted material, and requests that the  
43 permit section of the Draft EIS be revised.  
44

45 **[181-15, Roger Turner]** EIS Fails to recognize UF<sub>6</sub> as a RCRA permitted material. Depleted  
46 Uranium was determined to be a Solid Waste as defined by RCRA and the EIS in Tennessee,  
47 and the EIS fails to recognize the possibility that Idaho DEQ will similarly require a RCRA permit  
48 for this material. Please revise Permit Section.  
49

1 **Response:** Classification of waste by the State of Tennessee has no bearing on the handling,  
2 storage, and transport of wastes generation at the proposed EREF. To date, no States other than  
3 Ohio and Tennessee have expressed interest in regulating UF<sub>6</sub> as a RCRA waste. IDEQ has not  
4 indicated that UF<sub>6</sub> will be regulated as a RCRA waste in Idaho. Therefore, no change to  
5 Section 1.5.2 in the EIS is necessary.  
6

7  
8 **Comment:** The following comment asks whether solid waste generated at the proposed EREF  
9 would require a Toxic Substances Control Act (TSCA) or RCRA permit, and states that the EIS  
10 should describe the current status of mixed waste treatment acceptance criteria and shipping  
11 requirements.  
12

13 **[181-18, Roger Turner]** Also, this section reports that the final solid material would be shipped  
14 off-site. This raises the issue of whether it would require a TSCA or RCRA permit. The EIS  
15 should describe the current status of mixed waste treatment acceptance criteria, shipping  
16 requirements.  
17

18 **Response:** Hazardous waste (RCRA) permits are required for the treatment, storage, or disposal  
19 of hazardous wastes, and IDEQ implements RCRA within the State of Idaho. Text has been  
20 added to Section 4.2.11.2 of the EIS to clarify that the proposed EREF would not treat, store, or  
21 dispose of hazardous or mixed wastes in a manner that requires a RCRA permit. However, as  
22 noted in Section 1.5.3, the proposed EREF would request a hazardous waste generator number.  
23

24 TSCA is designed to regulate the introduction of new chemical substances or the significant  
25 new use of an existing chemical substance. Neither applies to the proposed EREF, so TSCA  
26 does not apply.  
27

28 Section 4.2.11.2 states that hazardous wastes generated at the proposed EREF would be  
29 collected at the point of generation, classified, packaged, and shipped offsite to a licensed  
30 TSD in accordance with Federal and State environmental and occupational regulations.  
31 Additional text has been added to Section 4.2.9.2 to clarify that the transportation of hazardous  
32 wastes is subject to U.S. Environmental Protection Agency (EPA) and DOT regulations. The  
33 current status of mixed waste treatment acceptance criteria is not within the scope of the EIS.  
34  
35

36 **Comment:** The following comment asks where the perfluoropolyether (PFPE) oil waste will be  
37 stored at the proposed EREF site. The comment also asks for the kilowatt rating of each of the  
38 four standby diesel generators, and how much diesel fuel will be stored on the site.  
39

40 **[187-01, John Weber]** After reviewing the safety analysis report and the EIS, I have a few  
41 questions and comments to present to NRC at this time. Because no Bobin (phonetic) oil  
42 recovery system will be used, where will the PFPE oil waste be stored?  
43 What is the kilowatt rating of each of the four standby diesel generators, and how much diesel  
44 will be stored on the site?  
45

46 **Response:** Specific details about the storage location of PFPE oil waste and diesel fuel at the  
47 proposed EREF will not be available until the facility design is finalized. The quantities of  
48 hazardous materials stored onsite, including diesel fuel, are considered to be sensitive information.

1 *However, such information was taken into account during the safety evaluation in the NRC's SER,*  
2 *NUREG-1951 (NRC, 2010b).*

3  
4 *As noted in Section 4.2.4.1 of the EIS, the development plan for the proposed EREF states that*  
5 *each of the four diesel-fueled emergency generators will be rated at 2500 watts (i.e., 2.5 kilowatts).*  
6

7  
8 **Comment:** The following comments note that radioactive waste would remain in the  
9 United States.

10  
11 **[032-04, Cindy Cottrell]** I'm against a foreign country making the profit from this plant and  
12 leaving the contamination in our Country.

13  
14 **[187-04, John Weber]** In section 10.1, it states that: "DOE is entitled to take title to and dispose  
15 of the waste." So the French citizens take the profits and the U.S. citizens get the waste.

16  
17 **Response:** *To ensure domestic uranium enrichment services, the generation of depleted*  
18 *uranium tails and uranium-contaminated waste that would need disposal in the domestic arena*  
19 *would be expected.*

20  
21  
22 **Comment:** The following comments express concern over radioactive waste being left in the  
23 State of Idaho.

24  
25 **[014-03, William Blair]** Idaho does not need to add to its radioactive waste problem.

26  
27 **[015-07, Beatrice Brailsford]** So, that's the proposal to meet the need of a domestic supply of  
28 enriched uranium. A uranium factory without any national purpose will produce fuel for everywhere  
29 in the world but here in Idaho, send its profits to France, and leave us with the waste.

30  
31 **[061-02, Nancy Greco]** I am also worried about the threats to our beautiful environment, not  
32 only from the construction and production of this plant, but also from the tons of waste which will  
33 be left behind. Idaho is not the armpit of the nation, and should not be seen as the perfect  
34 repository for more waste.

35  
36 **[110-01, John and Susan Medlin]** As the Snake River Alliance presentation pointed out, there  
37 is no current need for this facility, no compelling evidence that a nuclear renaissance is coming  
38 (or inevitable), no rationale for a French company building a nuclear facility in Idaho that  
39 purports to promote US energy security while importing inputs and exporting outputs, no  
40 provision for the deteriorating and dangerous waste that will haunt us for decades or maybe  
41 forever, no concern for yet another threat to the Snake River aquifer, the lifeblood of Idaho  
42 agriculture.

43  
44 So how can the NRC conclude that building this facility is vital, and that the most problematic  
45 outcome to be evaluated is construction dust?  
46



1 **[104-01, Carolyn McCollum]** There's little advantage to us Idahoans when Areva's nuclear  
2 fuel would be sent worldwide and its profits back to France while we are left with its radioactive  
3 waste, compounding INL's nuclear activities that have plutonium-contaminated the aquifer.  
4

5 **Response:** *As discussed in Sections 2.1.3 and 4.2.11.2 of the EIS, all waste from operations at*  
6 *the proposed EREF, including the depleted UF<sub>6</sub> tails cylinders, would be transported out of*  
7 *Idaho for treatment and disposal. Until a depleted UF<sub>6</sub> conversion facility is available, cylinders*  
8 *containing depleted UF<sub>6</sub> would be temporarily stored on an outdoor Cylinder Storage Pad.*  
9 *Storage of depleted UF<sub>6</sub> cylinders at the proposed EREF would occur for the duration of the*  
10 *facility's operating lifetime and before final removal of depleted UF<sub>6</sub> from the proposed EREF*  
11 *site. However, AES has stated that depleted UF<sub>6</sub> cylinders would not be stored at the proposed*  
12 *EREF site beyond the facility's licensed lifetime (AES, 2010a).*  
13  
14

15 **Comment:** The following comments are concerned with the costs of waste management and  
16 disposal.  
17

18 **[050-11, Joanie Fauci]** Who will pay for waste storage and eventual removal?  
19

20 **[083-04, Diane Jones]** Assuming that the project goes forward, and the enriched uranium is  
21 used in the United States, there's an assertion in the EIS that this would be an economical  
22 source of enriched uranium. My question is: Does that economy include the cleanup of the  
23 waste that's generated? It seems clear that the NRC has not yet figured out how this waste  
24 should be, could be disposed of, and it's the -- who bears the cost?  
25

26 **[096-02, Arjun Makhijani]** The cost of -- and I'm not saying do it, or don't do it here -- I'm just  
27 commenting on the Environmental Impact Statement, and what will be at risk, and what  
28 taxpayers might have to do if a private corporation unloads this DU under the Department of  
29 Energy, as it can do by law, and it has said it might do. And the Department of Energy takes it,  
30 and you're requiring them to put two or two and a half billion dollars out, and my estimate for  
31 what it would cost to dispose of 300,000 metric tons of depleted uranium is closer to eight or ten  
32 billion dollars. So, who's going to pay that? It's going to come -- everybody who is complaining  
33 about the deficit should at least pay some attention to the potential cost of this.  
34

35 **[171-07, John Tanner]** Now, as for who pays for disposal, so far the nuclear industry has been  
36 paying for all nuclear waste disposal, not the taxpayer. They certainly haven't been getting their  
37 money's worth as the saga at Yucca Mountain shows.  
38

39 **Response:** *AES is responsible for all costs of preconstruction, construction, operation, and*  
40 *decommissioning of the proposed EREF, including waste storage, removal, and disposal. In the*  
41 *case of the depleted UF<sub>6</sub>, the DOE would be required to take the material from the proposed*  
42 *EREF, but AES would still be responsible for the costs associated with transport, conversion,*  
43 *and disposal. Text has been added to Section 2.1.5.1 of the EIS for clarification.*  
44  
45

46 **Comment:** The following comments concern wastewater permitting and regulatory issues.  
47

1 **[066-23, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 21.  
2 Subsurface Sewage Disposal Requirements The wastewater system for the Visitor Center was  
3 not discussed in the draft EIS. The Visitor Center will be located adjacent to Highway 20  
4 approximately 1.5 miles from the enrichment facility. The exact site location has not been  
5 determined. The wastewater system for the Visitor Center will be an onsite subsurface disposal  
6 system with a projected flow of approximately 1500 gallons per day (gpd). Subsurface sewage  
7 disposal is governed by the subsurface sewage rules (58.01.03) and permitting has been  
8 delegated to the local Health District. DEQ participates in plan and specification review for  
9 collection systems with more than 2 connections and large soil absorption systems. We expect  
10 that AES will comply with all applicable regulations, licensing and operating requirements of  
11 both DEQ and the local Health District related to this facility.  
12

13 **[066-22, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 20.  
14 Wastewater System Requirements The Proposed Eagle Rock Enrichment Facility wastewater  
15 system consists of a collection system, private municipal wastewater treatment plant, and two  
16 (2) total containment lined wastewater lagoons. The system will be classified as a Public  
17 Wastewater System and subject to the requirements of the Wastewater Rules (IDAPA  
18 58.01.16). DEQ expects that AES will comply with all applicable requirements.  
19

20 **Response:** *Approvals and permits, such as those pertaining to municipal wastewater, must be*  
21 *obtained by AES from other regulatory agencies. Table 1-1 in Section 1.5.1 of the EIS lists the*  
22 *applicable requirements, including those for wastewater at the proposed EREF. Table 1-2 in*  
23 *Section 1.5.2 lists the agencies to which AES must submit the appropriate applications.*  
24

25 *A row for IDAPA 58.01.03 has been added to Table 1-1. The regulation is already listed in*  
26 *Table 1-2, but the entry has been modified to note that a permit may be required for the Visitor*  
27 *Center.*  
28

29  
30 **Comment:** The following comments note that little byproduct waste would be produced by the  
31 proposed EREF.  
32

33 **[133-03, Richard Provencher]** It includes an enclosed system that has virtually no byproduct  
34 waste generated through the flow sheet.  
35

36 **[133-06, Richard Provencher]** The facility does not require a large amount of water to operate.  
37 This is good from an aquifer conservation and a waste minimization standpoint.  
38

39 **Response:** *The NRC acknowledges the comments and appreciates the public participation.*  
40  
41

42 **Comment:** The following comments express concern about the operation of the Liquid Effluent  
43 Collection and Treatment Systems at the proposed EREF.  
44

45 **[027-15, Sara Cohn]** We also concerned that hazardous materials will be concentrated in  
46 retention basins prior to and after evaporation of any water. These materials have the potential  
47 to settle in sediments and be released into the air with other dust particles.  
48

1 [100-01, Wendy Matson; 191-17, Liz Woodruff] Are the filtration systems set up to  
2 decontaminate water prior to evaporation adequate, to ensure that containments will not be  
3 released in the air?  
4

5 [181-18, Roger Turner] Liquid Effluent Systems needs addressed. This section of the EIS  
6 (Page 2-20) describes a process where contaminated liquids would be processed for uranium  
7 removal through several precipitation units, filtration units, microfiltration units, and evaporation  
8 units. These units need to be described in detail and evaluated with respect to human and  
9 ecological risks. How are liquid contaminants collected and what is the risk to workers during  
10 these spills? Also, this section reports that the final solid material would be shipped off-site. This  
11 raises the issue of whether it would require a TSCA or RCRA permit. The EIS should describe  
12 the current status of mixed waste treatment acceptance criteria, shipping requirements.  
13

14 [184-13, Kitty Vincent] In addition we are concerned that the filtration systems set up to  
15 decontaminate water prior to evaporation adequate to ensure that contaminants will not be  
16 released in the air?  
17

18 **Response:** *The proposed Liquid Effluent Collection and Treatment System is described in*  
19 *Sections 2.1.4.2 and 4.2.6.2 of the EIS. Additional information about these systems has been*  
20 *added to Section 4.2.11.2, including the processes for sampling and treating the various liquid*  
21 *effluent streams.*  
22

23 *As discussed in Sections 2.1.4.2 and 6.1.3 of the EIS, liquid effluent would be routed to*  
24 *collection tanks and treated through a combination of precipitation and filtration to remove*  
25 *radioactive material prior to evaporation.*  
26

27 *As described in Sections 4.2.6.2 and 6.1.4, most stormwater runoff would be discharged to a*  
28 *detention basin for evaporation to the atmosphere and ground infiltration. Treated sanitary*  
29 *effluent and stormwater runoff from the cylinder storage areas would be discharged to lined*  
30 *retention basins for evaporation to the atmosphere. Although the retention basins would not*  
31 *receive process-related effluents and would not be expected to contain radioactivity or*  
32 *hazardous constituents from other sources, stormwater and sediment from these basins would*  
33 *be sampled periodically as part of the site environmental measurement and monitoring program*  
34 *(as described in Chapter 6).*  
35

36 *The public and occupational health impacts from operations of the proposed EREF are*  
37 *addressed in Section 4.2.10, and the environmental impacts of the proposed Liquid Effluent*  
38 *Treatment Systems are addressed in Section 4.2.6.2. As noted in Section 9.3.1.3 of the SER*  
39 *(NRC, 2010b), the NRC staff has concluded that the proposed controls will ensure that radiation*  
40 *levels to the public remain within regulatory limits and that as low as reasonably achievable*  
41 *(ALARA) liquid effluent goals are met.*  
42

43  
44 **Comment:** The following comments deal with the safety of long-term storage of depleted UF<sub>6</sub> at  
45 the proposed EREF site, the availability of the DOE conversion facilities, and ultimate  
46 disposition.  
47

1 **[006-01, Anonymous]** I am supportive of the AREVA project but would like to have heard more  
2 from the NRC on how waste from the process will be stored and ultimately disposed of.  
3

4 **[014-01, William Blair]** Idaho does not need more radioactive waste placed over the Snake  
5 Plain Aquifer in an active earthquake area. Until a safe method of handling and storing  
6 radioactive waste for thousands of years is devised, NO new facilities should be approved.  
7

8 **[015-05, Beatrice Brailsford]** The most domestic part of the proposal is that the waste will, in fact,  
9 stay here. The plant would produce 320,000 tons of depleted uranium hexafluoride over its  
10 licensed lifetime, and the door is already ajar for the license to be extended. That waste might be  
11 stored on outdoor concrete pads above the Snake River aquifer until the plant is decommissioned.  
12

13 It's worth noting that New Mexico sharply limits how much, and how long waste can stay at the  
14 plant there. The waste has to be treated before it can be disposed of. Two government-owned  
15 treatment plants are under construction, over budget, and behind schedule. Waste the U.S. has  
16 already accumulated will take a combined 43 years to process.  
17

18 **[015-14, Beatrice Brailsford]** The EREF will produce more than 350,000 tonnes of depleted  
19 uranium hexafluoride (DUF6) over its licensed lifetime, and the door is already ajar for the  
20 license to be extended. That waste would be stored in 25,718 cylinders on outdoor concrete  
21 pads above the Snake River Aquifer as long as the plant operates. DUF6 is both radioactive  
22 and chemically toxic and has to be treated before it can be disposed of. The DOE has built two  
23 plants to treat depleted uranium hexafluoride waste the US has already accumulated. That  
24 treatment will take a combined 43 years to process. A private US corporation is seeking a  
25 license for its own treatment plant. The draft EIS cavalierly dismisses any potential bottlenecks  
26 by stating that the waste could simply be sent to the DOE treatment plants before they're ready  
27 to process it and then their operating lives extended. But it is at least as likely that the DUF6 will  
28 be stored in Idaho for an uncertain length of time above the Snake River Aquifer, a sole source  
29 aquifer for nearly 300,000 people. Storage under these conditions must be fully evaluated under  
30 NEPA.  
31

32 **[030-04, Kerry Cooke]** The nuclear waste quagmire is not going to go away any time soon -  
33 not during licensing of this project; not during construction; not during operation; and not during  
34 decommissioning. The depleted uranium and low level waste the Areva plant will create will be  
35 added to the nuclear waste burden Idaho already carries. This plan should go no further until  
36 realistic plans are in place that address the need to take care of nuclear waste for centuries to  
37 come.  
38

39 **[032-02, Cindy Cottrell]** If Idaho allows this to happen, it will be the storage of all the waste  
40 forever, long after the plant has closed. There is no site established for waste to go to and will  
41 become the State of Idaho's problem for generations to come.  
42

43 **[045-01, Joan Drake]** I write to oppose the construction of the Areva nuclear power plant. I am  
44 very concerned that the proposed plant would produce an estimated 320,000 tons of depleted  
45 uranium hexafluoride over its licensed lifetime. In view of this, and the fact that its license might  
46 well be extended, indications are that this waste would likely be stored in or near Idaho until the  
47 plant's decommissioning. Even after its removal and treatment, there is no certain disposal

1 pathway. The Areva plant should not be licensed until regulations are in place for the  
2 environmentally safe disposal of large quantities of depleted uranium.

3  
4 **[048-02, Genevieve Emerson]** The EIS fails to consider the influence of wild fires in the region  
5 and also fails to adequately address the issue of waste storage and disposal, considering that  
6 there are no viable methods yet in existence for safely storing hexafluoride and depleted  
7 uranium.

8  
9 **[050-03, Joanie Fauci]** One of the areas I feel is under-emphasized in the DEIS is the Safety  
10 issue...

11  
12 •The storage of radioactive waste is also a safety concern. There is no current repository for the  
13 waste so how long it will stay in Idaho is unknown. Areva says it will get it out once the project is  
14 complete, but what guarantee do we have of that. Maybe the NRC can put some rules in as  
15 former governor of Idaho, Phil Batt, tried to institute with DOE waste at INL.

16  
17 **[066-03, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 2.  
18 Depleted Uranium Hexafluoride (DUF6) Waste Disposal Path Section 2.1.5.

19  
20 Section 2.1.5 acknowledges that long term storage of DUF6 presents a chemical hazard and  
21 that direct disposal is likewise prohibited because of this hazard.

22  
23 *The Defense Nuclear Facilities Safety Board (DNFSB) has reported that long-term*  
24 *storage of depleted UF6 in the UF6 form represents a potential chemical hazard if not*  
25 *properly managed (DNFSB, 1995). For this reason, the strategic management of*  
26 *depleted uranium includes the conversion of depleted UF6 stock to a more stable*  
27 *uranium oxide (e-g., triuranium octaoxide [U308]) form for long-term management*  
28 *(OECD, 2001). Also, the DOE evaluated multiple disposition options for depleted UF6*  
29 *and agreed that conversion to U308 was preferable for long term storage and disposal of*  
30 *the depleted uranium in its oxide form, due to the chemical stability of U308 (DOE,*  
31 *2000). Therefore, the disposal option considered in the EIS is the conversion of the*  
32 *depleted UF6 to U308 at either a DOE-owned or commercial conversion facility followed*  
33 *by disposal as U308. Direct disposal of depleted UF6 was ruled out because of its*  
34 *chemical reactivity (DOE, 1999b).*

35  
36 For this reason the Draft EIS further acknowledges that DUF6 must be converted at one of two  
37 facilities currently under construction.

38  
39 *DOE is currently constructing two conversion plants to convert the depleted UF6 now in*  
40 *storage at Portsmouth, Ohio, and Paducah, Kentucky, to U308 and hydrofluoric acid.*  
41 *AES would transport the depleted UF6 generated by the proposed EREF to either of*  
42 *these new facilities and pay DOE to convert and dispose of the material. The proposed*  
43 *EREF would generate approximately 321,235 metric tons (354,101 tons) in total over its*  
44 *operating lifetime (AES, 2010a). The depleted UF6 would be processed in a DOE*  
45 *operated conversion facility and then shipped off site for disposal.*

46  
47 Based on estimated capacity for depleted UF6 (DUF6) conversion at the Department of Energy  
48 (DOE) facilities in Paducah, Kentucky, and Portsmouth, Ohio, DEQ understands that it may take



1 DOE approximately 25 years to address the current backlog of DUF6 stored at these facilities.  
2 Based on this timetable, it will take additional time to convert the 25,718 cylinders (345,000  
3 tons) of DUF6 projected to be generated during the licensed life of the Eagle Rock enrichment  
4 facility (EREF). Accordingly, it can be expected that DUF6 will be stored at the Eagle Rock  
5 enrichment facility for a period significantly in excess of the operating life of the facility and  
6 potentially for a period of time which creates the “long term storage hazard” identified by  
7 DNFSB.  
8

9 **[070-02, Virginia Hemingway]** These statistics do not even begin to address the dangerous  
10 impact of 350,000 tons of depleted uranium that will be stored in more than three--30,000  
11 cylinders, which will be on cement pads above ground. Idaho is already a dumping ground for  
12 nuclear waste, and there is no place for it to go. There will be no place for it to go, because  
13 there are no plans for this waste to go anywhere.  
14

15 **[071-05, David Hensel]** And I think that the -- once again, forgive me, but I just sort of feel like  
16 well, the EIS says something is going to happen, and I don't think that's an adequate way to  
17 address it. I mean, I think that there should be a more concrete analysis of what's going to  
18 happen to that waste, how long it's going to be here, and what the likelihood, and what the cost  
19 of that's going to be.  
20

21 **[078-05, Hon. Wendy Jaquet]** Disposal of waste which is huge appears to still be a problem  
22 and safety concerns loom.  
23

24 **[086-03, Paula Jull]** Areva's plant would produce 320,000 tons of depleted uranium  
25 hexafluoride over its licensed lifetime, and its license might well be extended. All this waste  
26 might be stored in Idaho until the plant was decommissioned.  
27

28 **[103-04, Karen McCall]** This plant would produce 350,000 metric tons of depleted uranium  
29 which would be stored above ground. Depleted uranium has to be treated before it can be  
30 disposed of. Currently there are two treatment plants being constructed which are over budget  
31 and behind schedule with an enormous backlog of waste already needing to be treated.  
32

33 **[111-03, Robert Meikle]** And I can tell you that when we see these slides of this nuclear waste  
34 being stored, the way it was stored, there's no question -- that's going to scare “the heck” out of  
35 people. But that's not the way we do it now, folks. It's much better technology for the storage of  
36 nuclear waste, and it's been proven for many, many years.  
37

38 **[036-01, Christina Cutler, on behalf of the Idaho Department of Environmental Quality]** I  
39 am still questioning how they plan to dispose of the by-products/waste from the enrichment  
40 process. What type of storage facility do they plan to have? How long do they plan to store the  
41 waste? And what are they going to do with it eventually, long term storage at the facility or move  
42 it somewhere else?  
43

44 **[128-06, Bob Poyser]** Fourth. AREVA has a safe plan to temporarily store depleted uranium  
45 material during the life of the facility and safely transport that material, as stipulated by law, to a  
46 facility for deconversion.  
47

1 While shipments of depleted uranium to a deconversion facility may occur throughout the life of  
2 the project to reduce the total inventory, there will be no -- I say again -- no depleted uranium  
3 left at the site when enrichment activities are completed and the NRC license is terminated.  
4

5 **[133-07, Richard Provencher]** The byproduct that is generated as a result of the operation-  
6 depleted uranium-is solid and stable and can be stored safely for a long period of time without  
7 incident.  
8

9 **[136-01, Susan Rainey]** No uranium enrichment facility outside Id Falls by AREVA!!! The  
10 transport of radioactive material and the storage of nuclear waste are my biggest concerns.  
11 There are safety issues! We will be at risk. How will the waste be disposed of? Snake River  
12 Alliance did an excellent job explaining. NRC sounded like bureaucratic babble ignoring the real  
13 dangers and concerns. How is this really going to help us here in Idaho, USA? Let's look at  
14 other options. Not worth the risk  
15

16 **[147-02, Joey Schueler]** And so I want you to address that, and look at that more seriously,  
17 because I hear your statements and they didn't really speak to me about nuclear waste. And  
18 you all know that's why we're here. It's not -- and the sagebrush is important, and the dust is  
19 important, and economy is important. But we wouldn't be having public meetings if it weren't for  
20 the fact that you're going to put something that's highly toxic into our state, and there is no real  
21 solution. You've not given me one that I feel merits that choice.  
22

23 So my real--what seems like the follow-up question, ends up being after we talk about risk, is:  
24 What is your price? And I don't think there's a price for putting my family at risk. And I want you  
25 to recognize that. And I want you -- can you -- I know this is public comment.  
26

27 Can you answer me? Do you — can you tell me there is no risk to placing depleted uranium in  
28 Idaho? Can any of you answer that in the affirmative or negative? Is there no risk? Or maybe  
29 are you not at liberty to answer?...  
30

31 Yes. And based on your statement, I'm not convinced that you can answer to me that there's no  
32 risk. And if that is the answer that I'm to take away from this meeting, then the meeting should  
33 not be about a process. To me, it should involve some element of outrage, to me, at the  
34 audacity of non-Idahoans, whether they be French, or otherwise -- and in fact, now that I've this  
35 testimony, Idahoans themselves, putting me, my family, my little nephews who are two and five,  
36 at risk, cause you haven't -- you haven't really proven to me that isn't risk.  
37

38 So I'm going to have to go with that, because that's a safety issue to me. So tell me the pros of  
39 putting my family at risk, and why in Idaho, if there is risk, because I think we all know there is?  
40 Is it because there's low population here? Is it a lesser target for terrorism, which is an issue,  
41 hasn't been discussed? These mitigations, which I keep hearing, we're mitigating things, left  
42 and right here, do they make my family less safe, and all of these people's families more or less  
43 safe? Yeah. So your environmental requirements. You know, high -- we've had -- we've always  
44 mitigated environmental consequences since the dawn of this country, and, you know, like we  
45 see it in high obesity rates and things.  
46

47 The FDA can write off whatever they want; it doesn't make it right, or okay. And so we're not  
48 talking about impact. We're talking about what's right. We're not talking about what's in our best  
49 interest, financially. We're talking about what's right.  
50

1 So I hope you make a decision with that element in mind, knowing that people in Idaho are  
2 aware of that, and are watching that.

3  
4 **[147-11, Joey Schueler]** 7. I know this sounds obtuse, but enriched Uranium and the  
5 byproduct of creating enriched Uranium (spent fuel) is extremely hazardous and brings a level  
6 of instability to the area, especially considering the storing methods (see link):  
7 <http://www.nrc.gov/waste/spent-fuel-storage.html>  
8

9 **[157-03, Hon. Erik Simpson]** Now in the photograph that was showed, you saw the uranium  
10 safely stored. I must confess, a little rust on the container is not a problem, and what isn't stated  
11 is that that material is regularly monitored and inspected per federal guidelines. That was not  
12 stated.  
13

14 **[157-07, Hon. Erik Simpson]** Second, waste. In the Sun Valley area, a claim was made  
15 uranium will be stored in Idaho, or depleted uranium will be stored in Idaho indefinitely, and the  
16 storage of the material is a danger. Not true. Depleted uranium is stored safely daily throughout  
17 the United States without incident. In fact, companies that store this product are required to  
18 regularly monitor and inspect the waste containers. Depleted uranium can be deconverted to  
19 remove the fluoride for use by a multitude of industries. International Isotopes, an Idaho Falls-  
20 based company, is planning to construct a deconversion facility in New Mexico. And it was  
21 announced today, Uranium Disposition Services, LLC was recently selected to conduct hot  
22 functional testing of a conversion plant at Paducah, Kentucky, so there are plans for the waste  
23 that will be generated by this facility.  
24

25 **[168-06, Lon Stewart]** The Areva plant is not needed in the United States or the world. We  
26 would be adding to a waste that we currently have more than we know what to do with, do not  
27 know how to safely store it, and have no idea if what we think will work will actually work for  
28 1 million years. This doesn't sound good to me.  
29

30 **[181-03, Roger Turner]** The Draft EIS by the NRC significantly errs by minimizing the human  
31 health and environmental risks in the long-term and short-term storage of uranium. The EIS is  
32 flawed in its apparent assumption that another location will be certified for offsite storage, and  
33 that the waste is categorized as low-level.  
34

35 Here is an excerpt of the EIS that is directed under the title of "Public Health." "During the peak  
36 operation, the proposed EREF is expected to generate 1,222 cylinders of depleted uranium  
37 hexafluoride annually, which would be temporarily stored on an outdoor cylinder storage pad in  
38 26 approved type 48-wide containers before being transported to a DOE-owned or private  
39 conversion facility." That's their public health assessment of the project. But what facility are  
40 they referring to?  
41

42 In fact, this is not an EIS that carefully weighs the likelihood of another state stepping up to  
43 accept this waste, especially if there are problems in treating the uranium. This is an EIS that  
44 fails to follow the NEPA requirement to analyze realistic cumulative impacts.  
45

46 We've seen these types of examples in this, and the fact that no state wants a certified spent  
47 nuclear fuel site to accept commercial fuel. So, for now, all of these sites that create the waste  
48 temporarily store this waste at their locations. And this was the -- this was an enabled legislation  
49 that the Nuclear Waste Policy Act established in 1982, but they're still being stored temporarily.  
50

1 **[181-05, Roger Turner]** The EIS is also fatally flawed in its assumption that a treatment facility  
2 will be available to convert the depleted uranium. The depleted uranium must be treated before  
3 stored.  
4

5 **[181-11, Roger Turner]** Public Health risks of “Temporary” Storage of depleted Uranium  
6 should be addressed in EIS. The draft EIS by the NRC significantly errs by minimizing the  
7 human health and environmental risks in the risks of the storage of uranium in above-ground  
8 pads in eastern Idaho. The EIS is flawed in its apparent assumption that another location will be  
9 certified for off-site storage. The EIS fails to acknowledge that these casks may be breached by  
10 handling or corrosion. Here is an excerpt of the EIS, under the Public Health section:  
11

12       During peak operation, the proposed EREF is expected to generate 1222 cylinders of  
13       depleted UF6 annually, which would be temporarily stored on an outdoor cylinder storage  
14       pad in 26 approved Type 48Y containers before being transported to a DOE-owned or  
15       private conversion 27 facility.  
16

17 The above paragraph, under the Public Health Section, in fact, does not even discuss public  
18 health. The EIS must assume that the casks of depleted Uranium will remain for some time at  
19 the site, as the treatment facility to convert UF6 to the more stable oxide is behind in schedules  
20 and experiencing budget problems affecting production. Anytime heavy equipment is operated  
21 there is a risk that accidents will occur. In fact, casks of UF6 were damaged by heavy  
22 equipment at Oak Ridge, so the risk to workers and public health is real. The EIS needs to  
23 define “temporary” and fully assess health and worker risks, for longer term storage at the site.  
24

25 **[181-21, Roger Turner]** As mentioned above, the temporary storing of depleted and enriched  
26 uranium and at the Areva facility, is not a good idea, and the NRC should, if this project is  
27 approved, evaluate an alternative that limits the inventory of it to a bare minimum, immediately  
28 shipping it to the facilities to convert it to the more stable oxide, or for fuel fabrication.  
29

30 **[180-07, Kaye Turner]** Is it true that depleted uranium has to be treated before it can be  
31 disposed of?  
32

33 Is it true the U.S. is building two treatment plants and both are behind schedule, over budget  
34 and will have decades of already stored waste to treat?

35 Is it true Areva’s waste will stay in Idaho as long as Areva operates here?  
36

37 **[183-01, James Vincent]** Since the two US de-conversion facilities are not operational, and if  
38 they do become operational they will first process already existing depleted uranium waste for  
39 60 plus years of existing waste, from the 100 plus nuclear energy producing plants here in the  
40 US, the timeline for the removal of the on site storage of Uranium hexafluoride DUF6 from Idaho  
41 is in doubt. I have a problem with storing this waste above ground and possible leaching of  
42 contaminants into the aquifer for our state  
43

44 Their figures are that these are increasing to 2,000 metric tons per year. And, in addition, there’s  
45 like 12 million cubic feet of low-level waste from these plants. Supposedly, we have around  
46 60,000 metric tons of waste in this country that we have to get rid of one way or another.  
47

1 **[183-07, James Vincent]** Since the two US de-conversion facilities are not operational, and if  
2 they do become operational they will first process already existing depleted uranium waste for  
3 60 plus years of existing waste, from the 100 plus nuclear energy producing plants here in the  
4 US, the timeline for the removal of the on site storage of Uranium hexafluoride DUF6 from Idaho  
5 is in doubt. I have a problem with storing this waste above ground and possible leaching of  
6 contaminants into the aquifer for our state.

7  
8 **[191-12, Liz Woodruff]** • The draft EIS assumes that depleted uranium hexafluoride will not be  
9 stored on site beyond the licensed life of the facility. But the draft EIS also acknowledges that  
10 Areva may well apply for a license extension. The NRC must discuss the length of a potential  
11 extension and whether or not cumulative waste storage would be allowed....

12  
13 • Any newly operating deconversion facilities in the US will first process already existing  
14 depleted uranium waste, the time-line for the removal of DUF6 from Idaho is therefore uncertain  
15 and verifiably in excess of the time-line specified by Areva in the draft EIS.

16  
17 **[193-04, Liz Woodruff, on behalf of the Snake River Alliance]** So once again the waste,  
18 rusty cylinders. The U.S. already stores nearly 700,000 metric tons of depleted uranium. That's  
19 in Paducah, Kentucky, Portsmouth, Ohio, and Oak Ridge, Tennessee. And all of that waste has  
20 to be disposed of first, before the waste produced by a commercial, new commercial reactor --  
21 or excuse me -- new commercial enrichment factory, like AREVA, could be disposed of. So we  
22 are behind, we're back in line behind these other wastes.

23  
24 So why is that waste just sitting there? Why has it been sitting there for so long? Well,  
25 hexafluoride is highly reactive with water. So none of this waste can be disposed of until it's  
26 treated in deconversion plants.

27  
28 Those plants are under construction, over budget, and behind schedule. So this waste has  
29 nowhere to go, nowhere to be deconverted before it can be disposed of, and it's the concern of  
30 the Snake River Alliance, that that means this depleted uranium waste will be stored above the  
31 aquifer for 300,000 people, the sole source aquifer in Idaho, for decades.

32  
33 **[192-03 and 192-09, Lisa Young]** Also, it is not likely that the waste will be deconverted in a  
34 timely manner, as the U.S. has no operational deconversion facilities, and even with those that  
35 are up-and-coming, the current stockpile of around 704,000 tons of depleted uranium waste will  
36 take several decades at least to fully deconvert, with our current capabilities. This facility is  
37 estimated to produce an additional 320,000 tons of depleted uranium waste over the course of  
38 its lifetime. When it comes time to decommission this facility, all of this waste will need to be  
39 relocated, and, as the deconversion process looks limited, it will likely be transported elsewhere  
40 for further storage.

41  
42 **[192-04 and 192-10, Lisa Young]** The storage of the depleted uranium hexafluoride, which  
43 reacts with water, water vapor, to produce two dangerous, corrosive, and soluble compounds,  
44  $UO_2F_2$  and HF, is extremely unstable. The production of these compounds presents huge risks  
45 in the storage timeline, as the corrosion of storage cylinders and the possibility for leaks is a  
46 very real reality. Even *after* proper deconversion of this waste, the remaining waste, which  
47 cumulatively becomes *more* of a radioactive threat over time, has nowhere to go for acceptable  
48 long-term storage, and will continue to plague our waste storage sites with more and more



1 barrels of poison, creating more and more of a health and safety risk for the surrounding  
2 communities. *Producing this waste is irresponsible*, and licensing a facility that will do *just that* is  
3 undeniably irresponsible.

4  
5 **Response:** *The onsite management of depleted UF<sub>6</sub> generated by the proposed EREF,*  
6 *including details and impacts of temporary onsite storage, is addressed in the EIS, in*  
7 *Sections 2.1.3 (facility description), 2.1.5 (depleted uranium management), 4.2.10.2*  
8 *(radiological exposures), and 4.2.11 (waste management) of the EIS. It was determined that all*  
9 *impacts would be SMALL.*

10  
11 *The management of other (non-UF<sub>6</sub>) wastes generated by the proposed EREF is addressed in*  
12 *Section 4.2.11. Temporary storage of non-UF<sub>6</sub> wastes at the proposed EREF would be*  
13 *conducted in accordance with license conditions.*

14  
15 *As discussed in Section 2.1.5.1, the DOE has completed construction of two depleted uranium*  
16 *conversion plants. The Portsmouth conversion plant is expected to begin full operations in*  
17 *summer 2011, and the Paducah plant is expected to begin operation later in the year. As noted*  
18 *in Section 4.2.11.2, the conversion of the existing DOE inventory of depleted uranium*  
19 *hexafluoride to depleted uranium oxide is expected to consume the first 18–25 years of*  
20 *operation at these two facilities. Depending on the timing of shipment to a conversion plant*  
21 *(DOE or private), depleted UF<sub>6</sub> generated by the proposed EREF may continue to be stored in a*  
22 *safe manner until conversion is possible.*

23  
24 *The inventory of depleted UF<sub>6</sub> for conversion does not include any other form of LLRW or SNF*  
25 *from commercial nuclear power plants. SNF from commercial nuclear power plants requires a*  
26 *permanent high-level waste repository and would not be treated or processed at a depleted*  
27 *uranium conversion plant. Similarly, LLRW that does not require conversion is eligible for*  
28 *disposal at licensed disposal facilities.*

29  
30 *Under the USEC Privatization Act, DOE is obligated to accept depleted UF<sub>6</sub> waste from the*  
31 *proposed EREF (see Section 2.1.5.1). Depleted UF<sub>6</sub> from the proposed EREF would be stored*  
32 *in steel containers and would not require treatment at the proposed EREF prior to shipment to a*  
33 *conversion facility.*

34  
35 *As noted in Section 4.2.11.2, proper and active depleted UF<sub>6</sub> cylinder management, including*  
36 *routine inspections and maintaining the anticorrosion layer on the cylinder surface, has been*  
37 *shown to limit exterior corrosion or mechanical damage and provide for safe and long-term*  
38 *storage of depleted UF<sub>6</sub>. AES has committed to the implementation of such a cylinder*  
39 *management program as discussed in Section 4.2.11.3.*

40  
41 *While awaiting shipment to a conversion facility, some amount of depleted UF<sub>6</sub> will be stored at*  
42 *the proposed EREF for the operating life of the facility. If DOE is not able to take possession of*  
43 *the depleted UF<sub>6</sub> as it is generated, the potential exists that some of the depleted UF<sub>6</sub> generated*  
44 *over the facility lifetime will be stored onsite until license termination. However, AES has stated*  
45 *that depleted UF<sub>6</sub> cylinders would not be stored at the proposed EREF site beyond the licensed*  
46 *lifetime of the proposed facility (AES, 2010a).*

1 *DOE intends to reuse the conversion product to the maximum extent possible or package it for*  
2 *disposal at an appropriate disposal facility (DOE, 2004a; DOE, 2004b; DOE, 2007a; DOE,*  
3 *2007b; 72 FR 15870).*

4  
5  
6 **Comment:** The following comments express concern that disposal of depleted uranium is  
7 currently not a viable option because NRC is in the midst of rulemaking on the disposal of large  
8 quantities of depleted uranium.

9  
10 **[012-01, Janice Berndt]** The Areva factory would produce 320,000 tons of waste materials  
11 (depleted uranium hexafluoride) over its licensed lifetime. This waste could be stored in Idaho  
12 until the plant is decommissioned. Even if it is removed and treated, there is no certain disposal  
13 pathway. The draft EIS essentially ignores the fact that the U.S. does not have guidelines on  
14 how the treated waste will be disposed. Areva's factory should not be licensed until regulations  
15 are in place for disposal of large quantities of depleted uranium.

16  
17 **[014-01, William Blair]** Idaho does not need more radioactive waste placed over the Snake  
18 Plain Aquifer in an active earthquake area. Until a safe method of handling and storing  
19 radioactive waste for thousands of years is devised, NO new facilities should be approved.

20  
21 **[015-06, Beatrice Brailsford]** The draft EIS essentially ignores the fact that the U.S. does not  
22 have guidelines on how large quantities of the treated waste will be disposed of, but it will most  
23 certainly be disposed of in the United States.

24  
25 **[015-15, Beatrice Brailsford]** The draft EIS essentially ignores the fact that the U.S. does not  
26 have guidelines on how the treated waste will be disposed of. This failure is egregious. The  
27 NRC is in the midst of a multi-year rulemaking process to establish guidelines for depleted  
28 uranium disposal. The NRC is aware that the rulemaking has already stirred some controversy,  
29 and the outcome is not certain. The NRC must fully discuss the disposal options under NEPA  
30 and must not issue a record of decision or a license until the disposal rules are in place.

31  
32 **[022-01, Judy Carroll]** I am strongly opposed to Areva's plan to build a plant here because I do  
33 not believe that the radioactive waste will be handled appropriately and taken out of Idaho.  
34 Areva is taking advantage of Idaho in the fact that the unemployed and poor need jobs. What  
35 they don't say is that Areva will also be bringing sickness and death to Idaho. We may seem like  
36 a simple people but we do know in this state how important clean water and land are to our way  
37 of life. Idahoans are the ones who are able to enjoy beautiful wilderness, rivers and wildlife. If  
38 Areva needs uranium enriched, let them enrich it in France!

39  
40 **[027-01, Sara Cohn]** As the Federal Register announcement for this proposed rulemaking  
41 suggests, NRC does not currently provide adequate guidance for the type of waste streams that  
42 will be created by the proposed Eagle Rock facility and stored on site. Until regulations are in  
43 place governing disposal of depleted uranium, and disposal facilities have implemented those  
44 regulations, ICL believes it is inappropriate to license any new uranium enrichment facility. NRC  
45 should consider the creation of adequate rules to guide the safe disposal of depleted uranium  
46 as paramount to permitting individual facilities.

1 **[027-06, Sara Cohn]** Waste Storage: ICL has provided public comments on the scoping  
2 analysis for the proposed AREVA Enrichment facility in Idaho Falls, Idaho (see Attachment A)  
3 and provided comments on the Potential Rulemaking for the Safe Disposal of Unique Waste  
4 Streams Including Significant Quantities of Depleted Uranium (see Attachment B). As the  
5 Federal Register announcement for the potential rulemaking states, NRC does not currently  
6 provide adequate guidance for disposal of the type of waste streams that will be created by the  
7 proposed Eagle Rock enrichment facility and stored onsite. We are very concerned the lack of  
8 appropriate regulations for the safe disposal of depleted uranium will facilitate unsafe storage of  
9 such materials within the project site and above a sole source aquifer. Until rules are in place to  
10 govern the disposal of depleted uranium and existing disposal facilities have implemented those  
11 regulations, ICL believes it is inappropriate to license any new uranium enrichment facility in  
12 Idaho. NRC should consider the creation of adequate rules to guide the safe disposal of  
13 depleted uranium as paramount to permitting individual facilities.

14  
15 From Attachment B:

- 16 • More clarity is needed with regard to the scope of the potential rulemaking.
- 17 • Until regulations are in place governing disposal of depleted uranium and disposal  
18 facilities have implemented those regulations, it is inappropriate to license any new  
19 uranium enrichment facility.
- 20 • The NRC should coordinate with appropriate federal agencies, such as the U.S.  
21 Environmental Protection Agency (EPA) and others, to ensure comprehensive  
22 analysis of potential disposal sites and to protect natural resource, human health,  
23 ICL Comments on NRC public workshops and proposed rulemaking – depleted uranium and  
24 national security.

25  
26 **[030-02, Kerry Cooke]** Depleted uranium is adding to a waste burden that Idaho already  
27 suffers with, and I believe that you owe it to the people of the United States to not license any  
28 facility that is going to increase, make any more depleted uranium, until this question is  
29 thoroughly solved, not proposed, not suggested, not theoretical, but solved. Just needs to stop.

30  
31 **[032-05, Cindy Cottrell]** For ever ton of uranium enriched enough for use in a nuclear power  
32 reactor creates 7 tons of depleted uranium waste. No Country that enriches uranium has figured  
33 out how to dispose of this waste. The problem with depleted uranium is that it becomes more  
34 radioactive over the course of 1,000,000 years. Where would we store this knowing it will  
35 become more radioactive?

36  
37 **[045-01, Joan Drake]** I write to oppose the construction of the Areva nuclear power plant. I am  
38 very concerned that the proposed plant would produce an estimated 320,000 tons of depleted  
39 uranium hexafluoride over its licensed lifetime. In view of this, and the fact that its license might  
40 well be extended, indications are that this waste would likely be stored in or near Idaho until the  
41 plant's decommissioning. Even after its removal and treatment, there is no certain disposal  
42 pathway. The Areva plant should not be licensed until regulations are in place for the  
43 environmentally safe disposal of large quantities of depleted uranium.

44  
45 **[066-04, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]**  
46 Moreover, the PEIS assumes that once converted the low-level radioactive waste would be  
47 disposed of at a commercial low level waste disposal facility:

48

1           *The Commission has stated that depleted uranium in any form (e.g., UF6, U308) is*  
2           *considered a form of low-level radioactive waste (NRC, 2 005a). However, the chemical*  
3           *reactivity of depleted UF6 precludes it from being a stable waste form, and thus makes it*  
4           *unsuitable for direct disposal without conversion (DOE, 19996). As discussed in*  
5           *Section 2.1.5.1, AES has requested the DOE to accept all depleted UF6 generated at the*  
6           *proposed EREF for conversion to the oxide form for disposal (AES, 2010a) After*  
7           *conversion of depleted uranium tails (depleted UF6) to U308, disposal of this U308 at a*  
8           *commercial low-level waste disposal facility would be a viable option if the disposal*  
9           *facility meets the requirements of 10 CFR Part 61.*

10  
11           However, because this waste will be generated in Idaho it must be shipped to the Northwest  
12           Compact facility at Hanford Washington. It is Idaho understands that the Hanford facility is  
13           nearing its source term limit and would need an expansion license to accept the ERAES waste.  
14           It is possible that this license might not be granted or that the facility might otherwise be  
15           unavailable at the time waste is ready for disposal. Moreover Idaho understands that the Energy  
16           Solutions facility in Clive Utah, which might otherwise accept the waste, currently will not do so  
17

18           In light of the current situation at DOE facilities and the potential unavailability of licensed low  
19           level radioactive waste disposal facilities, DEQ requests NRC provide more clarity on the  
20           environmental risks associated with long term storage and further explain in detail how  
21           AES/NRC plans to meet this commitment for DUF6 off site treatment/disposal.  
22

23           **[070-02, Virginia Hemingway]** These statistics do not even begin to address the dangerous  
24           impact of 350,000 tons of depleted uranium that will be stored in more than three --  
25           30,000 cylinders, which will be on cement pads above ground. Idaho is already a dumping  
26           ground for nuclear waste, and there is no place for it to go. There will be no place for it to go,  
27           because there are no plans for this waste to go anywhere.  
28

29           **[078-05, Hon. Wendy Jaquet]** Disposal of waste which is huge appears to still be a problem  
30           and safety concerns loom.  
31

32           **[083-05, Diane Jones]** How can we expect the company to -- whose financial future is  
33           uncertain, to be able to guarantee that they will bear the cost of treating all that waste and  
34           disposing of all that waste, when the process for disposing of the waste is not even known?  
35           This seems highly reckless to me, and not a very sound economical calculation.  
36

37           **[083-07, Diane Jones]** And then I think, myself, along with, I think, many members of this  
38           audience, wonder how the generation of 350 metric tons of waste, of depleted uranium, for  
39           which no known disposal route has been proposed, accepted, whatever, can be regarded as a  
40           small impact.  
41

42           **[086-04, Paula Jull]** Areva's plant should not be licensed until regulations are in place for  
43           disposal of large quantities of depleted uranium.  
44

45           **[088-05, Stan Kidwell]** Areva's plant should not be licensed until regulations are in place for  
46           disposal of large quantities of depleted uranium.  
47

1 **[095-05, Linda Leeuwrik]** Areva's plant would produce 320,000 tonnes of depleted uranium  
2 hexafluoride over its licensed lifetime, and its license might well be extended. All this waste  
3 would likely be stored in Idaho until the plant was decommissioned. Even after it is removed and  
4 treated, there is no certain disposal pathway.

5  
6 **[096-01, Arjun Makhijani]** Depleted uranium in large amounts from enrichment plants is not  
7 covered by any U.S. environmental rule. The NRC has ruled, as stated in the EIS, that depleted  
8 uranium from enrichment plants is low-level waste. However, the low-level waste rule itself, the  
9 impacts of large amounts of depleted uranium have not been considered under the low-level  
10 waste rule. According to the rule itself, and now according to the U.S. Nuclear Regulatory  
11 Commission, which has admitted in October of 2005, and in 2009 started a process of  
12 rulemaking as to how and under what conditions disposal of depleted uranium in large amounts  
13 from enrichment plants should be carried out.

14  
15 What does large amounts mean? Large means more than small, and small has been defined as  
16 a few metric tons. This facility will produce 300,000 metric tons, approximately, I did a rough  
17 addition from the EIS. That is definitely very large amounts of depleted uranium.

18  
19 I want to read to you what the U.S. National Academy has said about depleted uranium, and its  
20 concentrations of radioactivity, which are much, much higher than uranium ore. In fact, they're  
21 quite a bit like the transuranic waste you have here in Idaho that the state government has  
22 insisted be sent to the Waste Isolation Pilot Plant, and the National Academy, in considering the  
23 question of depleted uranium, also shares my own opinion of quite longstanding, which has  
24 been presented to the NRC in expert testimony on more than one occasion, that depleted  
25 uranium is like the transuranic waste you have here in Idaho, that you don't want in this state,  
26 and that you're sending to New Mexico because it is more than 100 nanocuries per gram of  
27 alpha emitting long-lived radionuclides that grow in radioactivity over time, because you get  
28 Thorium-230 and radium-226. And it's many, many times more radioactive than uranium ore,  
29 including its radium and thorium that is present in uranium ore.

30  
31 The Environmental Impact Statement does not consider the impacts of depleted uranium  
32 disposal. And, in my opinion, it does not conform to the NRC regulations, 10 CFR Part 51.71,  
33 and it does not conform to the regulations of the Council on Environmental Quality, and it does  
34 not conform with the National Environmental Policy Act. And I will read it, but you can find on  
35 page 224 that they, essentially, say, if the licensing requirements for land disposal of depleted  
36 uranium can be met, then it be disposed of. However, every calculation of disposal of large  
37 amounts of depleted uranium but one that has been done has shown that disposal of large  
38 amounts in shallow land burial would grossly violate existing regulations by as much as 1,000  
39 times over the radiation dose limit or more, including official calculations, except one done by  
40 the NRC in 2009, which did not calculate doses according to the regulation; that is, it did not  
41 calculate organ doses.

42  
43 I won't detain you for long. I am going to submit for the record the comments I have already  
44 given the NRC, as an invitee of the NRC to the deliberations on the rulemaking. And I will  
45 observe that this particular EIS, the drafters of it have not talked to their counterparts, or appear  
46 not to have talked to their counterparts in the section of the NRC that are actually currently  
47 engaged in making the rule as to how the depleted uranium should be disposed of. And the  
48 author of that paper, SECY 0187, by coincidence, himself, said that calculating doses the way  
49 he did for a million years in shallow land burial was "silliness." And then the NRC moderator, like



1 you, said the other day that silliness is perhaps not an appropriate regulatory term, but I take it  
2 in that spirit. We could invent some other regulatory equivalent of silliness, but NRC's own  
3 invited geochemist agreed that even calculating shallow land burial doses for 10,000 years is  
4 not appropriate. This stuff needs to be disposed of in deep disposal. The cost of -- and I'm not  
5 saying do it, or don't do it here -- I'm just commenting on the Environmental Impact Statement,  
6 and what will be at risk, and what taxpayers might have to do if a private corporation unloads  
7 this DU under the Department of Energy, as it can do by law, and it has said it might do. And the  
8 Department of Energy takes it, and you're requiring them to put two or two and a half billion  
9 dollars out, and my estimate for what it would cost to dispose of 300,000 metric tons of depleted  
10 uranium is closer to eight or ten billion dollars. So, who's going to pay that? It's going to come --  
11 everybody who is complaining about the deficit should at least pay some attention to the  
12 potential cost of this....

13  
14 **[105-04, Eve McConaughey]** The most glaring question, not addressed or answered  
15 concerned the transportation risks and ultimate unresolved problem of waste disposal.

16  
17 **[122-01, Kathy O'Brien]** I do not want the waste from this plant here in Idaho or anywhere. It is  
18 not clean energy because of the waste both from this plant and from nuclear power plants.  
19 Areva's plant would produce 320,000 tonnes of depleted uranium hexafluoride over its licensed  
20 lifetime, and its license might well be extended. All this waste might be stored in Idaho until the  
21 plant was decommissioned. Even after it's removed and treated, there is no good way to  
22 dispose of it.

23  
24 **[150-02, Katie Seevers]** The draft EIS assumes that the depleted uranium hexafluoride will not  
25 be stored on the site past the license life of the facility. However, it also acknowledges that  
26 Areva may apply for a license extension. I find the lack of a fully developed rule on disposal of  
27 depleted uranium problematic, especially when coupled with the prospect of seismic activity in  
28 the area and the potentiality for a license extension.

29  
30 **[174-01, Christopher Thomas; 198-01, Vanessa Pierce]** The classification of depleted  
31 uranium for disposal purposes has been a contentious issue that the State of Utah, the Nuclear  
32 Regulatory Commission, and other key-stakeholders have worked on for years, and relevant  
33 rule-making to govern the disposal of this unique waste is still underway. As such, the  
34 assumption in the draft EIS that there will be a disposal pathway for the depleted tails from the  
35 AES facility is unfounded.

36  
37 The draft EIS states that "[t]he depleted UF<sub>6</sub> would be sent to a DOE conversion facility, and  
38 then shipped offsite for disposal" (2-25). Given the current NRC rule-making to develop a site-  
39 specific analysis for the disposal of large quantities of depleted uranium, and the State of Utah's  
40 own requirement for a site-specific analysis for DU disposal, it is premature to assume that  
41 depleted uranium will be found suitable for disposal at EnergySolutions' Clive facility or any  
42 other facility. Indeed, the standards by which any site could be found "suitable" for the safe,  
43 long-term disposal of DU have yet to be codified.

44  
45 The draft EIS does not explicitly identify any specific site for the final disposal of the converted  
46 DU waste. We believe this is in part because no disposal site will currently accept depleted  
47 uranium waste for disposal. For instance, note that DU oxide waste from DOE's Savannah River  
48 Site (SRS) currently has no disposal pathway

49

1 Although there has been some effort to move this waste from South Carolina to the Waste  
2 Control Specialists site in Texas, the waste would only be stored there on a temporary basis  
3 rather than permanently disposed. Furthermore, the single trainload of SRS DU waste that  
4 made its way to the Clive site is also being held in temporary storage until the completion of a  
5 site specific analysis in accordance with Utah Rule R313-25-8 - Technical Analyses.  
6

7 If disposal at a DOE site were indeed a “plausible strategy” as noted in the EIS (2-25), the DOE  
8 would simply send this DU waste to one of its other disposal sites. The fact that DOE has been  
9 forced to look at temporary storage options for the SRS DU appears to be prima facie evidence  
10 that DOE has no disposal option. In light of recent events, the NRC Commission’s decision that  
11 disposal of DU waste at a DOE site is a “plausible strategy” must be re-evaluated.  
12

13 We believe the Draft EIS is deficient because it assumes that converted DU tails will have a  
14 disposal pathway, when in reality the most recent evidence indicates that this waste could  
15 indeed become an orphan waste stream, similar to the SRS DU. We believe that the final EIS  
16 should assess what would happen if there is not a disposal pathway for the converted DU tails.  
17 This assessment should address at least the following issues: how the DU tails would be  
18 managed, the health and environmental risks of such management, who would manage them,  
19 and at what cost. We believe these are critical issues that must be considered and addressed,  
20 given that DU disposal is not currently feasible, and may not be feasible for the next many  
21 years, especially if most or all near-surface disposal sites are eventually found to not be  
22 protective of human health and the environment in the long-term.  
23

24 **[136-01, Susan Rainey]** No uranium enrichment facility outside Id Falls by AREVA!!! The  
25 transport of radioactive material and the storage of nuclear waste are my biggest concerns.  
26 There are safety issues! We will be at risk. How will the waste be disposed of? Snake River  
27 Alliance did an excellent job explaining. NRC sounded like bureaucratic babble ignoring the real  
28 dangers and concerns. How is this really going to help us here in Idaho, USA? Let’s look at  
29 other options. Not worth the risk.  
30

31 **[148-01, Eric Schuler]** Taken as a whole, the EIS suggests that this facility will have a relatively  
32 low impact on the environment. Of course several aspects of this, of the — have been  
33 overlooked in making this conclusion. For instance, as others have already noted, it does not  
34 consider the impact of the exempted preconstruction activities, the high risk of wildfires in the  
35 area, or the lack of an appropriate disposal pathway for depleted uranium. Accordingly, the true  
36 impact of this facility is certainly larger than the DEIS suggests.  
37

38 **[150-03, Katie Seevers]** I find the lack of a fully developed rule on disposal of depleted  
39 uranium problematic, especially when coupled with the prospect of seismic activity in the area  
40 and the potentiality for a license extension.  
41

42 **[153-07, Andrea Shipley; 197-07, Andrea Shipley, on behalf of the Snake River Alliance]**  
43 This is not to mention the lack of a fully developed rule on disposal of depleted uranium in the  
44 US, leaving no pathway for disposal of this waste, and a line of already existing depleted  
45 uranium hexafluoride waiting for deconversion.  
46

47 **[169-01, Margaret Stewart]** And aside from AREVA’s greed, grim, and very, very devastating  
48 global environmental and human rights record around the world, particularly in Africa, I

1 vehemently oppose the NRC licensing of this facility on grounds that the facility has not been  
2 proven necessary, a huge amount of dangerous radioactive waste that would be created has no  
3 disposal place, the nuclear reactors that the EIS says will need AREVA's product more than  
4 likely will never be built.

5  
6 **[168-03, Lon Stewart]** ...We will probably get 350,000 tons of uranium waste over the life of  
7 the facility that no one currently knows how to dispose of....

8  
9 **[168-06, Lon Stewart]** The Areva plant is not needed in the United States or the world. We  
10 would be adding to a waste that we currently have more than we know what to do with, do not  
11 know how to safely store it, and have no idea if what we think will work will actually work for 1  
12 million years. This doesn't sound good to me.

13  
14 **[171-05, John Tanner]** The question of disposal of depleted uranium I suppose was left out of  
15 the Environmental Impact Statement because that's not really going to be an AREVA, or an  
16 Idaho problem. The depleted uranium that we produce will not be in the form that's suitable for  
17 disposal; that is, if the nation wants it disposed of, it will have to be shipped out of state to a  
18 conversion plant to convert the fluoride form to the oxide form, which, by the way, is the form  
19 that it is when it's an ore. And then it will be a problem for the Department of Energy, and  
20 possibly for the conversion plant which will be out of state.

21  
22 **[175-04, Ellen Thomas]** Areva's plant would produce 320,000 tonnes of depleted uranium  
23 hexafluoride over its licensed lifetime, and its license might well be extended. There is no  
24 certain disposal pathway.

25  
26 **[180-08, Kaye Turner]** Is it true the NRC has stated a whole new regulatory scheme has to be  
27 developed to guide in the disposal of depleted uranium?  
28 Is it true that no country on earth that enriches uranium knows how to dispose of the depleted  
29 uranium?

30  
31 **[181-01, Roger Turner]** So now comes a proposal to create and store 350,000 tons of uranium  
32 compounds at eastern Idaho. Setting aside the radiation risk, uranium compounds exhibit a  
33 similar heavy metal toxic characteristics as does mercury. So, why now is there support for  
34 uranium enrichment project, for which there is no repository outside of Idaho?

35  
36 **[191-13, Liz Woodruff]** The lack of a fully developed rule on disposal of depleted uranium  
37 creates great uncertainty about the disposal pathway for this waste

38  
39 **[192-13, Lisa Young]** The storage of the depleted uranium waste, which will likely not be  
40 deconverted in any reasonable timeline, poses a serious risk to our health and safety as  
41 Idahoans, and to the residents of any other region where the waste will be stored in the future.  
42 Even after proper deconversion of this waste, the remaining waste, which cumulatively becomes  
43 more of a radioactive threat over time, has nowhere to go for acceptable long-term storage, and  
44 will continue to plague our waste storage sites with more and more barrels of poison, creating  
45 more and more of a health and safety risk for the surrounding communities. *Producing this  
46 waste is irresponsible, and licensing a facility that will do just that is undeniably irresponsible.*

47

1 **[193-03, Liz Woodruff, on behalf of the Snake River Alliance]** And we believe that the  
2 storage of this radioactive waste, on site, in Idaho, poses an insurmountable risk to the licensing  
3 of this facility. The enriched uranium then travels to a conversion facility, once again  
4 transported, and then it's transported again to a reactor, where high-level radioactive waste in  
5 the form of spent fuel is the result.

6  
7 So how much waste is produced in the enrichment of uranium? Well, for one ton of enriched  
8 uranium, seven tons of depleted uranium waste are produced, and this is a picture of depleted  
9 uranium hexafluoride waste stored in Piketon, Ohio. You can see in the rusty cylinders on  
10 concrete slabs. It's been sitting there for decades because the NRC has not established an  
11 adequate disposal pathway for depleted uranium....

12  
13 And the NRC has recently acknowledged this fact, and started a rule making process around  
14 the disposal of depleted uranium meant to reclassify it, essentially, and find an adequate  
15 disposal pathway.

16  
17 So what have they decided? The NRC still wants to dispose of depleted uranium in shallow  
18 dumps designed for a few hundred years. This is an inadequate disposal pathway. It has not yet  
19 been an established rule it's a waste stream that becomes more radioactive, over time. There  
20 are no deconversion facilities, and thus, it will be sitting above the Snake River aquifer for  
21 decades.

22  
23 Areva would add 320,000 metric tons of DUF6 to the current amount.

24  
25 **Response:** *As discussed in Sections 4.2.11 and 4.13.4 of the EIS, AES intends to transport*  
26 *depleted UF<sub>6</sub> to DOE facilities after temporary onsite storage for conversion and disposition by*  
27 *the DOE (AES, 2010a), pursuant to Section 3113 of the 1996 USEC Privatization Act,*  
28 *42 U.S.C. 2297h-11. On January 18, 2005, the NRC stated that, pursuant to Section 3113 of*  
29 *the USEC Privatization Act, disposal at a DOE facility represents a plausible strategy for the*  
30 *disposition of depleted uranium tails (NRC, 2005).*

31  
32 *As stated in Section 4.13.3.5, DOE intends to reuse the conversion product to the maximum*  
33 *extent possible or package it for disposal at an appropriate disposal facility (DOE, 2004a; DOE,*  
34 *2004b; DOE, 2007a; DOE, 2007b; 72 FR 15870). DOE wastes disposed at DOE owned and*  
35 *operated facilities are not subject to NRC or Agreement State licensing authority.*

36  
37 *According to DOE Directive 435.1-1, if a non-DOE facility (e.g., a commercial facility) is used for*  
38 *disposal of low-level radioactive waste, an exemption from DOE's policy of using only DOE*  
39 *disposal facilities to manage radioactive wastes must be obtained (DOE, 2001). To obtain the*  
40 *exemption, it must be shown that the non-DOE disposal facility complies with applicable*  
41 *Federal, State, and local requirements, and has the necessary permits, licenses, and approvals*  
42 *for the specific wastes to be disposed.*

43  
44 *Commercial radioactive waste disposal facilities, in contrast to DOE disposal facilities, are*  
45 *licensed by the NRC or designated Agreement State according to the requirements specified at*  
46 *10 CFR Part 61 or compatible Agreement State regulations. Currently, the NRC is engaged in*  
47 *rulemaking to specify a requirement for a site-specific analysis for the disposal of low-level*  
48 *radioactive wastes, including large quantities of depleted uranium (NRC, 2009). In the interim,*

1 compliance with the performance objectives specified in 10 CFR Part 61, Subpart C, continues  
2 to provide reasonable assurance that low-level radioactive waste, including depleted uranium,  
3 can be safely disposed at licensed facilities. On April 13, 2010, NRC staff summarized existing  
4 policy and guidance to assist Agreement States in making informed decisions regarding  
5 compliance with the performance objectives for land disposal of significant quantities of  
6 depleted uranium until a new regulation is implemented (NRC, 2010a).

#### 9 I.5.19 Socioeconomics

10  
11 **Comment:** The following comment asserts that economic risk should be given a higher priority  
12 in the EIS.

13  
14 **[050-13, Joanie Fauci]** The economic risk should be given a higher priority in the EIS.

15  
16 **Response:** *The extent of the analysis of each resource area considered in the EIS is*  
17 *dependent on its overall impact. As shown in Section 4.2.12 of the EIS, the NRC staff has*  
18 *determined that the socioeconomic impacts of the proposed action would be SMALL.*  
19 *Therefore, additional review is not warranted.*

20  
21  
22 **Comment:** The following comment outlines AES's position on the funding of the EREF project.

23  
24 **[128-08, Bob Poyser]** Finally, let it be made clear. The Eagle Rock enrichment facility is being  
25 fully funded through direct investment by AREVA, and like any major capital project, the balance  
26 will be financed through a loan accompanied by interest charges, repayment schedules, and  
27 certain protections for the lender.

28  
29 AREVA will bear the full cost of construction and operation of the Eagle Rock enrichment  
30 facility. Even the removal of depleted uranium from the site is accompanied by a payment to the  
31 deconversion facility for its services.

32  
33 In the final analysis, AREVA will bear the full cost of construction and operation.

34  
35 **Response:** *The NRC acknowledges the comment.*

36  
37  
38 **Comment:** The following comment expresses EPA's interest in any information on how Tribes'  
39 economic conditions would be enhanced because of the project.

40  
41 **[138-09, Christine Reichgott, on behalf of the U.S. Environmental Protection Agency,**  
42 **Region 10]** Since the project would result in economically beneficial impacts to the region, EPA  
43 would be interested in any information on how Tribes' economic conditions would be enhanced  
44 because of the project.

45  
46 **Response:** *The socioeconomic impacts, beneficial or otherwise, on the Shoshone-Bannock*  
47 *Tribes was included with the socioeconomic benefits to the citizens of Bannock, Bingham,*  
48 *Caribou, and Power Counties, in which the tribes' reservation is located and most of the tribal*  
49 *members in the region are believed to reside. It would be difficult to predict the specific benefits*



1 to, or enhancement of economic conditions of, the Tribes because of the difficulty in predicting  
2 such factors as the number of tribal members who might be employed in some capacity by the  
3 project.

4  
5  
6 **Comment:** The following comment asserts that the Socioeconomics part of the EIS has not  
7 been given enough weight.

8  
9 **[146-02, Doug Sayer]** So I want to point out in your EIS, when it comes to the socioeconomical  
10 portion, that there is a piece that I don't think carried enough weight. You know, in the history of  
11 nuclear energy in the last few years in the United States, the supply chain has broken down. As  
12 we haven't had construction projects, it's deteriorated. I want to assure you, that's not the case  
13 in Idaho. That network of suppliers is accredited, that understands the Code of Federal  
14 Regulations, that understands safety significance, is alive and well. We encourage you to  
15 pursue this license and approve it, so that we can get back to work and build these nuclear  
16 projects like our country needs them.

17  
18 **Response:** *The NRC staff acknowledges this comment and the technical expertise located in*  
19 *the project area. The site selection process used by AES, as discussed in Section 2.3.1.3 of the*  
20 *EIS, took the available construction and operations workforces into consideration as well as the*  
21 *available technical resources. The analysis of the socioeconomic impacts took into account the*  
22 *occupations likely to be required during construction and operation of the facility, and compared*  
23 *them to the number of workers present in these occupations in the 11-county Region of*  
24 *Influence (ROI) surrounding the site of the proposed facility. This information was then used to*  
25 *estimate the number of in-migrating workers and their families likely to reside in this ROI, and*  
26 *the potential impact in-migrants may have on housing, and on public and educational services.*  
27 *The relatively small number of in-migrants likely to move into the ROI during these phases of*  
28 *the project, and the likelihood that most in-migrants and their families are likely to live in urban*  
29 *areas in this ROI, where there are good housing and educational choices and adequate existing*  
30 *public service provision, will likely mean that the incremental impact of worker in-migration on*  
31 *the provision of these resources in the ROI would be SMALL.*

32  
33  
34 **Comment:** The following comment expresses disagreement with the conclusions in the Draft  
35 EIS on the socioeconomic effects of the proposed project.

36  
37 **[150-08, Katie Seevers]** This concerns me, as does the prospect of an artificial local economy  
38 supported by an unsustainable factory. In reference to table 2-6 of the draft EIS, I would like to  
39 contest the conclusions drawn on the socioeconomic effects of the facility. Once it is  
40 decommissioned, this area could very well resemble, economically speaking, so many of  
41 Idaho's logging towns once the mill has been closed down. Tax dollars will be long gone, the  
42 local area will quite probably be left with waste from the facility, and jobs that supported local  
43 residents will be nonexistent.

44  
45 **Response:** *In-migration of workers and their families associated with preconstruction,*  
46 *construction, and operation of the proposed facility may require more teachers and other local*  
47 *public service employees. However, the relatively small number of in-migrants likely to move*  
48 *into the 11-county ROI during these phases of the project, and the likelihood that most in-*

1 migrants and their families are likely to live in urban areas in this ROI, where there are good  
2 housing and educational choices and adequate existing public service provision, will likely mean  
3 that the incremental impact of worker in-migration on the provision of these resources in the ROI  
4 would be SMALL, and unlikely to create "boom-bust" conditions. These impacts are described  
5 in Section 4.2.12 of the EIS.  
6  
7

8 **Comment:** The following comment questions the science and environmental research  
9 supporting the analysis of impacts in the Draft EIS, including socioeconomic impacts.  
10

11 **[181-02, Roger Turner]** And what is the science and environmental research behind the  
12 endorsement of the AREVA project? Well, science and environmental risks are being  
13 downplayed on this proposed project, because of job creation, and economic development.  
14

15 **Response:** *The NRC staff believes it has provided an objective analysis in the EIS for all*  
16 *resource areas, based on the requirements of NEPA and the NRC regulations for implementing*  
17 *NEPA in 10 CFR Part 51. In the case of job creation and economic development, the*  
18 *socioeconomic impacts, beneficial and adverse, were found to be SMALL as presented in*  
19 *Section 4.2.12 of the EIS. Such a finding does not downplay the adverse impacts found in other*  
20 *resource areas with SMALL-to-MODERATE or MODERATE impacts.*  
21  
22

23 **Comment:** The following comment expresses concern about the negative impact of the  
24 proposed project on opportunities for hunting and fishing, due to the influx of people into the  
25 area.  
26

27 **[183-05 and 183-12, James Vincent]** My other main concern is personal. I live to hunt and fish  
28 in Idaho. It is the main reason I love this state. I believe my opportunities to hunt and fish will be  
29 severely limited if 1000 new residents are brought into Idaho Falls to work at this facility. There  
30 will be many less opportunities to successfully apply for big game permits, and my favorite rivers  
31 will be impacted with crowding. Already, there is talk of limiting the number of boats on the  
32 South Fork of the Snake River. I am not the only resident who values Idaho outdoor activities,  
33 and sustained controlled growth for the quality of Idaho life. I believe many of my neighbors also  
34 live in Idaho Falls for the same reason.  
35

36 **Response:** *Two hundred and sixty-six new temporary residents are expected in the 2-county*  
37 *ROI, consisting of Bonneville and Bingham Counties, during the construction and*  
38 *199 permanent residents are expected during operation of the proposed EREF, as discussed in*  
39 *Sections 4.2.12.2 and 4.2.12.3 of the EIS. In general, the resulting impacts from the additional*  
40 *residents would be SMALL, and the impact of these residents on the total number of big game*  
41 *licenses issued by the State would also likely be SMALL.*  
42  
43

44 **Comment:** The following comments suggest that jobs and economic impacts should not be  
45 considered in the EIS.  
46

47 **[008-01, Carol Bachelder]** I know that this was an attempt to limit the discussion to the  
48 environmental impact, but we have strayed, haven't we? Into jobs and economic projection.  
49

1 **[087-04, Dennis Kasnicki]** Comment 3: This was a meeting on the Draft EIS.... I think ALL of  
2 the attendees who commented in favor of this facility (perhaps in particular the “dignitaries” or  
3 their representatives who commented) spoke from the standpoint of the potential economic  
4 benefits of this plant to the area. Those comments were “off subject” and therefore distracting  
5 and very inappropriate. I suppose this was a forum where anyone is free to say mostly anything,  
6 but that IS a serious distraction and therefore a problem.  
7

8 **[106-05, Ted McConaughy]** I think -- and as for jobs, I feel this is a fallacious argument that  
9 should not be entertained in the environmental review process, because this is not a hearing on  
10 jobs. As far as jobs goes, I think that any time we dedicate ourselves to building one facility,  
11 especially something as massively expensive as this, we deprive ourselves of the opportunities  
12 to build alternative facilities. That money is not going into research, and wind, or solar, or  
13 biomass, or whatever. It’s going into a single source, and we don’t have that money back, so --  
14 and any one of those sources would produce jobs. So I really would like to take the jobs issue  
15 off the table. That’s not to say it’s unimportant, but it is to say that whatever we do, we will be  
16 creating those jobs, and they will not be lost.  
17

18 **Response:** *The economic impacts, including any benefits such as job creation, of the proposed*  
19 *EREF are considered in the EIS analysis as presented in Section 4.2.12. While it is true that*  
20 *other endeavors may produce jobs, the creation (or loss) of jobs is an integral part of the*  
21 *socioeconomic impact analysis, as required under NEPA and the NRC’s NEPA-implementing*  
22 *regulations in 10 CFR Part 51, and is not “off subject.”*  
23  
24

25 **Comment:** The following comments address the issue of the influence of the proposed EREF  
26 on future economic activity.  
27

28 **[147-16, Joey Schueler]** 12. Even if one cannot accept that nuclear waste in Idaho could prove  
29 hazardous, the sheer notion that a nuclear plant exists and nuclear waste resides and is  
30 transported in our borders is a deterrent to other commercial interests and could hamper other  
31 major industries from choosing Idaho as a site to locate their business, due to poor “livability”  
32 incentives for their employee base.  
33

34 **[184-04, Kitty Vincent]** They say the project will create jobs. Well, what might be lacking are  
35 creative entrepreneurs who can help the Idaho Falls job market as my husband and I did when  
36 we moved a fly line company to the city in the late 1990s. Idaho Falls has the potential to be a  
37 major center for green energy products and projects. I have heard that most of the supposed  
38 1000 jobs will actually be for people who are brought in to work on the project whose  
39 qualifications meet the unique technical level of skill needed. Also, I truly believe property values  
40 will be damaged by the presence of this facility as will the influx of new business. Who in their  
41 right mind would come to a city that has a nuclear facility eighteen miles to the West at the foot  
42 of one of the most active seismic areas in the country? Especially a facility that is owned and  
43 managed by a company that has a history of problems?  
44

45 **Response:** *In addition to the 590 direct jobs created at the proposed facility during the peak*  
46 *year of construction, and the 550 direct jobs created during operations, the proposed EREF is*  
47 *expected to produce 1097 indirect jobs in the 11-county ROI during the peak year of*  
48 *construction and 2739 indirect jobs in this ROI during operations. On the other hand, while*

1 *there is no clear evidence to suggest that industrial and commercial plants and facilities are*  
2 *averse to locating in areas with existing or proposed nuclear facilities, there is some evidence to*  
3 *suggest that the perception of nuclear facilities may affect local property values, providing an*  
4 *incentive for entrepreneurs and employees in some companies to look elsewhere for locations*  
5 *for new plants and facilities. Text has been added to the EIS in Section 4.2.12 to summarize*  
6 *these findings.*

7  
8  
9 **Comment:** The following comments express concern that the economic boost given to the  
10 region is only temporary and that long-term impacts to the citizens of Idaho could be adverse.

11  
12 **[032-06, Cindy Cottrell]** The jobs that this plant will produce will be few in comparison to the  
13 cost of allowing it here. Maybe 300 people will get jobs that will not last forever, but only for the  
14 lifetime of the plant. Right now it will cost tax payers would have to loan Areva \$2 billion. Other  
15 types of energy would be much more worth the taxpayer's money. That's a lot of money for  
16 300 jobs and waste to manage forever. Other kinds of energy that is less risky would be better  
17 to invest in.

18  
19 **[050-05, Joanie Fauci]** Another area I am very concerned about is economics.

20  
21 • Many testifiers at the hearing were from the Idaho Falls area. They want jobs. They want jobs  
22 now. They don't care about the future and their children's future in that area. Bringing nuclear  
23 material to that area, with unknown future removal of it, is very short sighted. We should not be  
24 sacrificing jobs now for a ruined environment for the rest of human life.

25  
26 **[184-06, Kitty Vincent]** The idea that this will boost the economy of Idaho is short sighted.  
27 Affected could be the lives of the future citizens in Idaho and the West.

28  
29 **[189-01, Josh Well]** These jobs are temporary and nuclear waste is forever.

30  
31 **Response:** *In addition to the 590 direct jobs created at the proposed facility during the peak*  
32 *year of construction and the 550 direct jobs created during operations, the proposed EREF is*  
33 *expected to produce 1097 indirect jobs in the 11-county ROI during the peak year of*  
34 *construction and 2739 indirect jobs in the 11-county ROI during operations. On the other hand,*  
35 *in Section 4.2.10 of the EIS, the NRC staff determined that impacts on human health from*  
36 *preconstruction, construction, and operation of the proposed EREF would be SMALL. It was*  
37 *determined in Section 4.2.11 that impacts from waste management, including the removal of all*  
38 *radioactive material and waste from the proposed EREF by the end of the license period, would*  
39 *also be SMALL.*

40  
41  
42 **Comment:** The following comments address the magnitude of the impact of employment,  
43 income, and tax revenues, suggesting that the positive impacts are larger than those presented  
44 in the EIS.

45  
46 **[041-02, Hon. Tammy de Weerd; 156-02, Robert Simison, on behalf of Hon. Tammy de**  
47 **Weerd]** We do feel that taking the "no action alternative" is not a viable option for the State of  
48 Idaho, and believe, just by looking at the socioeconomic impacts, as others have stated, is valid

1 reasons why we should move this project forward. I just want to specifically point out that, you  
2 know, while the draft EIS does list it as a small impact, due to the criteria that was used, in the  
3 State of Idaho, that part of the region, the 11 counties over there, it is really not a small impact.  
4 It has a tremendous impact, here, in the state, and we believe, as a city, that this will also  
5 impact this side of the state, here, in the Treasure Valley, as we try to work more and more with  
6 the products and services that are coming out of INL, and hope that there will be partnerships  
7 that will come from the private industry as well as the research that's currently being done at  
8 INL, that may answer questions that many people still might have about nuclear energy and  
9 depleted uranium in the future. I think this could be a good partnership for the area.

10  
11 **[098-03, Linda Martin]** The Regional Development Alliance has done several impact studies,  
12 which have been noted in previous instances, and the positive local impact of diversifying the  
13 tax base in Bonneville County is significant. Whereas the current annual tax rolls may reflect an  
14 annual property tax income of a few hundred dollars, the Eagle Rock Enrichment Facility would  
15 bring in approximately \$4 million.

16  
17 We are looking forward to the thousands of jobs during the various phases. While all human  
18 jobs and endeavors are subject to risk, this risk outweighs, by far -- I mean, this risk is  
19 outweighed, by far, by the benefits of this project.

20  
21 As an economic development agency, we are already receiving inquiries from projects  
22 interested in this project, seeking to open new offices, and train and hire new employees.

23  
24 This is a great thing for the economic health of our community and the State of Idaho. Quoting  
25 testimony from the December 08 hearing in Idaho Falls: "We don't need a bailout. We need  
26 AREVA."

27  
28 **[098-10, Linda Martin]** The Regional Development Alliance conducted an IMPLAN economic  
29 impact study regarding AREVA's Eagle Rock Enrichment Facility decision to locate in eastern  
30 Idaho. The combined phases, for the purposes of this analysis, are expected to cover a  
31 multiyear period (30-35 years) across three phases of development (design, construction,  
32 operation) and would number in excess of \$5 Billion in total output.

33  
34 The positive local impact of diversifying the tax base in Bonneville County, is significant.  
35 Whereas the current annual tax rolls may reflect an annual property tax income of a few  
36 hundred dollars, the Eagle Rock Enrichment Facility would bring in approximately \$4 Million.

37  
38 As an economic development agency, we are already receiving inquiries from companies  
39 interested in this project, seeking to open new offices, and train and hire new employees. This is  
40 a great thing for the economic health of our community, and the state of Idaho. We are looking  
41 forward to the thousands of jobs during the various phases of the project. And while all human  
42 jobs and endeavors are subject to risk, this risk is outweighed by the benefits of the project.

43  
44 Quoting previous testimony in December, 2008 from Rich Cartney "We don't need a bailout, we  
45 need AREVA!"

46  
47 **[124-02, Lane Packwood]** There is one -- I'd like to echo the comments of some of the other  
48 speakers here tonight. We are somewhat surprised that the EIS finds that the economic and



1 fiscal benefits associated with the project to be small, and I think I just -- we -- we disagree that  
2 it's small. It is, in fact, enormous. And just to put some perspective on the impact of this project,  
3 just taking the numbers from peak facility construction alone, direct employment, 590 jobs, that  
4 would decrease unemployment in the two county ROI by 10 percent. There's only 5100  
5 unemployed workers in Bonneville and Bingham County. 590 jobs is an enormous impact. In  
6 fact, the roll-up of all the jobs of the four phases examined nearly 3300 jobs. Just this project  
7 alone would move Idaho unemployment by one-half a percent. So that is non-negligible impact  
8 on employment in this state. The same with income generated by the project.... So, for  
9 example, just the income generated by the 11 years leading up to full operation, just the  
10 construction phases, is half a billion dollars, and that's almost five and a half times what the  
11 estimate here, in Table 4-27, lists. The same with property taxes. Just a tremendous impact on  
12 the economy. 2.8 million in income taxes generated, 6 million in sales and use taxes, 5.3 million  
13 in property taxes. When the facility is operational, it'll be paying something like 3.5 million in  
14 property taxes. Now Bonneville County only collects 23.8 million now, and just put that in some  
15 perspective. What does that mean to a local economy? You know, 3.5 million is 58 teachers,  
16 each year, year after year, just the average -- and that's the average salary, that's not starting  
17 salary of teachers in Idaho. Fifty-eight. So I guess our point here tonight is just to encourage the  
18 NRC to take a look at the economic impact, and to understand what a -- what a -- the scale of  
19 the project, and we've heard various estimates of the overall cost, the capital expenditures, 2, 3,  
20 4 million. Let's just say it's 3.5 billion. Let's just say that's the cap X of the project. Well, the  
21 economy of the State of Idaho, the GDP is only 52 billion. That's 6.6 percent of our state GDP.  
22 On a federal level, if we were to compare that to what size federal project would represent  
23 6.6 percent of federal GDP, AREVA is to Idaho what a \$947 billion project out be to the national  
24 economy. And that's bigger than the stimulus. So certainly not small in its impact.  
25

26 **[164-01, Timothy Solomon]** The Regional Development Alliance is experienced in doing  
27 economic impact analysis, and I want to congratulate you on the socioeconomics portion of the  
28 EIS, which I'm going to address throughout my comments. We subsequently ran an additional  
29 analysis based upon your numbers in the EIS, to see how those came out, and those job  
30 numbers are "right on" in our estimation.  
31

32 The job creation numbers for a region of this size are quite substantial. They are not an  
33 insignificant impact on the state and on our region. 308 preconstruction jobs and  
34 1,687 construction jobs will impact Idaho, in a very positive way, over the years in which those  
35 activities take place. 3,289 direct, indirect, and induced jobs are also very, very significant  
36 throughout the operational period.  
37

38 The direct output effects of more than 315 million in the first full year of operations is not a small  
39 impact, and provides a substantial base of potential business for local suppliers, service  
40 providers, and sole proprietors, a very important part of our economy. Even if the output  
41 remains static over a 20 year period, using the numbers in the EIS, the region would have a  
42 base of 6.3 billion in total direct East Coast activity from which to draw for those business  
43 opportunities over that operational period.  
44

45 We do urge the NRC to take another look at your labor income numbers. We think they may be  
46 slightly less than a project of this size, and a region of this size merits. However, if you just take  
47 the 92.4 million that is outlined in the EIS, if you take that out over a 20 year operating history,

1 assuming no year-to-year change, we estimate nearly \$2 billion of labor income along on that  
2 side of it.

3  
4 The economic impact of AREVA's \$2 billion investment in Idaho is driven by capital investment  
5 that leads to job creation. The Eagle Rock enrichment facility location in eastern Idaho is  
6 absolutely critical to the economic vitality of the region. Real property has improved and begins  
7 yielding tax revenues at a much higher level. New investments are made in tangible personal  
8 property that keeps our manufacturing and processing capabilities and our job infrastructure on  
9 the leading edge. Jobs are created; dollars are spent in the local economy. Business to  
10 business and business to consumer transactions increase, real per capita income increase, tax  
11 revenues throughout the area of impact, both direct and indirect, to the investment, increase,  
12 and the general economy of the entire state is strengthened. And with that, we highly encourage  
13 you strongly support the issuance of a license.

14  
15 **[165-01, Hon. Lee Staker]** I won't get into a lot of details, other than to say the tax base of  
16 Bonneville County is about \$5.9 billion, and you start looking at this as a tax base. Even though  
17 the full taxes won't be from that, it is significant to Bonneville County.

18  
19 **Response:** *Although the employment, income, and tax revenues created by the*  
20 *preconstruction, construction and operation of the proposed facility may appear to be large,*  
21 *when compared to the size of the economic and fiscal baseline of the 11-county ROI, the*  
22 *employment impacts are SMALL. As discussed in Section 4.2.12 of the EIS, changes in total*  
23 *(direct and indirect) employment during the peak year of construction would amount to less than*  
24 *1 percent of total employment in the 11-county ROI. While the commenter is correct that*  
25 *impacts are presented for discrete intervals for construction, preconstruction impacts occur only*  
26 *in one year (2012), and operations impacts would be the same in each year beginning in 2022.*  
27 *Chapter 7 of the EIS (Benefit-Cost Analysis) provides the total (i.e., summed over all years of*  
28 *the project) employment, income, and fiscal impacts of the project. Labor income data and*  
29 *assumptions used in the analysis of impacts have been verified.*

30  
31  
32 **Comment:** The following comments address the issues of financial incentives, including tax  
33 breaks and the highway overpass grant, provided by the State of Idaho.

34  
35 **[050-08, Joanie Fauci]** The State of Idaho has had to cut budgets everywhere. Yet somehow  
36 they found money to loan to Areva and also provide tax breaks. This is wrong! I am mad that my  
37 tax dollars have already been given to this project.

38  
39 **[180-02, Kaye Turner]** Is it true the state of Idaho, i.e., the taxpayers are giving this company  
40 huge tax breaks to build this nuclear plant?

41  
42 **[098-02, Linda Martin]** Under economic impacts, there are no Idaho taxes directly going to  
43 support the construction of this facility. As a group which encouraged the grassroots statewide  
44 support of the legislation, it should be noted that it not only applies to AREVA, but to any other  
45 new capital investment of similar magnitude. These are earned benefits to any company which  
46 chooses to invest in Idaho, of similar monetary amounts. The DOE issued a federal loan  
47 guarantee, not a federal loan. This was based on the technical ability and the creditworthiness  
48 of AREVA, currently a U.S. corporation.

1 **[098-09, Linda Martin]** Economic Impacts: There are NO Idaho taxes directly going to support  
2 the construction of this facility. As a group which encouraged the grassroots statewide support  
3 of the legislation, it should be noted that it not only applies to AREVA, but to any other new  
4 capital investment of similar magnitude. These are *earned* benefits to companies choosing to  
5 invest in Idaho. The DOE issued a federal loan guarantee – not a federal loan. This was based  
6 on technical ability and financial credit worthiness from AES, and American corporation.

7  
8 **[106-03, Ted McConaughy]** Another concern I have here is this idea that government should  
9 subsidize these industries, and we have Bob Poyser from AREVA saying, in quotes here:  
10 “AREVA will bear full costs.” And so far, they have not. So far, the state throws in money for the  
11 ‘interchange for nowhere’ and there’s other subsidies that come, right and left. And I think that  
12 even the Tea Party people ought to be upset about these government facilities for this  
13 construction here. We all ought to say no--AREVA should be funding this stuff, not the  
14 government.

15  
16 **[150-06, Katie SeEVERS]** My final concern I would like to address tonight are the economic  
17 implications associated with this facility. The company who is creating this facility is French, and  
18 its production of enriched uranium in the United States does not result in domestic control of  
19 that product as addressed in the draft EIS, section 2-17. In spite of this, the State of Idaho has  
20 “bent over backwards,” awarding tax exemptions funded by Idaho taxpayers. Additionally, the  
21 Department of Energy has provided a \$2 billion loan guarantee with more of our tax dollars, and  
22 then, to top all of this off, Idaho Department of Labor and Commerce granted \$750,000 towards  
23 an overpass. Perhaps we could just write everybody in Bonneville County a check. All the same,  
24 a substantial portion of our state and federal tax dollars are being allocated towards a facility  
25 which will be decommissioned within 30 years.

26  
27 **[182-03, Brianna UrSEnbach]** Assuming that the U.S. uranium fuel supply is insecure, it is  
28 clear that the EREF will not fix it, and although it is not specifically related to the EIS, it is worth  
29 noting that the federal and state tax dollars are being used to subsidize this project. Thus EREF  
30 provides no tangible security improvements to the American people, but it does lay a financial  
31 burden on them.

32  
33 **[183-04, James Vincent]** My other issue is about estimates of uranium throughout the world.  
34 The research I have done shows that there’s somewhere between 50 years at the low end, and  
35 100 years on the optimistic side. Why would we utilize a technology that costs literally billions of  
36 dollars to implement, with public tax dollars for a loan guarantee, and I realize that it is a  
37 guarantee, and Idaho tax incentives for a limited time technology? Even 100 years is not very  
38 long, as far as reserves.

39  
40 **[183-11, James Vincent]** My research has found known estimates world wide of uranium  
41 somewhere between 50 years on the low end and 100 years on the optimistic side. Why would  
42 we utilize a technology that costs literally billions of dollars to implement with public tax dollars  
43 for a loan guarantee and Idaho tax incentives for a limited time technology, Even 100 years is  
44 not very long as far as reserves.

45  
46 **[184-07, Kitty Vincent]** Areva’s proposed Eagle Rock Enrichment Facility (EREF) will store  
47 radioactive waste above the sole source aquifer for nearly 300,000 people; impact sensitive  
48 species; require the transport of radioactive materials; impair the Hell’s Half Acre National

1 Monument; support destruction of the John Leopard homestead, which has been recommended  
2 for the National Register of Historic Places; devour billions of dollars in state and federal  
3 largess; and obliterate farmland that is potentially protected by the federal government. The  
4 Alliance is here to say it is not worth the risk.  
5

6 **[191-25, Liz Woodruff]** State and federal largess. • In 2008, the state of Idaho showered Areva  
7 with huge tax breaks funded by Idaho taxpayers, including a cap on property tax valuation at  
8 \$400 million and unnecessary sales tax exemptions....  
9

10 • Not convinced the state had already done enough, the state Departments of Labor and  
11 Commerce gave Areva \$750,000 to help offset the cost of a highway interchange at its site,  
12 even though the project hadn't been approved by the NRC and sidestepping traditional Idaho  
13 Transportation Department review.  
14

15 **Response:** *The NRC staff acknowledges these comments. However, the tax issues discussed*  
16 *in the comment above are not issues in which the NRC is involved.*  
17  
18

19 **Comment:** The following comments concern the DOE loan guarantee.  
20

21 **[032-06, Cindy Cottrell]** The jobs that this plant will produce will be few in comparison to the  
22 cost of allowing it here. Maybe 300 people will get jobs that will not last forever, but only for the  
23 lifetime of the plant. Right now it will cost tax payers would have to loan Areva \$2 billion. Other  
24 types of energy would be much more worth the taxpayer's money. That's a lot of money for 300  
25 jobs and waste to manage forever. Other kinds of energy that is less risky would be better to  
26 invest in.  
27

28 **[050-07, Joanie Fauci]** • The State of Idaho has had to cut budgets everywhere. Yet somehow  
29 they found money to loan to Areva and also provide tax breaks. This is wrong! I am mad that my  
30 tax dollars have already been given to this project.  
31

32 • I have read that loan guarantees are frequently defaulted on. With the existing track record of  
33 these, the US government/NRC, should not be offering any to Areva or any other company.  
34

35 **[098-02, Linda Martin]** Under economic impacts, there are no Idaho taxes directly going to  
36 support the construction of this facility. As a group which encouraged the grassroots statewide  
37 support of the legislation, it should be noted that it not only applies to AREVA, but to any other  
38 new capital investment of similar magnitude. These are earned benefits to any company which  
39 chooses to invest in Idaho, of similar monetary amounts. The DOE issued a federal loan  
40 guarantee, not a federal loan. This was based on the technical ability and the creditworthiness  
41 of AREVA, currently a U.S. corporation.  
42

43 **[098-09, Linda Martin]** Economic Impacts: There are NO Idaho taxes directly going to support  
44 the construction of this facility. As a group which encouraged the grassroots statewide support  
45 of the legislation, it should be noted that it not only applies to AREVA, but to any other new  
46 capital investment of similar magnitude. These are *earned* benefits to companies choosing to  
47 invest in Idaho. The DOE issued a federal loan guarantee – not a federal loan. This was based  
48 on technical ability and financial credit worthiness from AES, and American corporation.  
49

1 **[103-06, Karen McCall]** Areva wants US Federal loan guarantees in the amount of \$2 billion  
2 dollars. US taxpayers would get far more energy for that money spent on renewables. An  
3 analysis by Idaho Power shows that nuclear power would cost significantly more per megawatt  
4 hour than wind, geothermal and biomass.  
5

6 **[145-02, Ann Rydalch]** I urge the NRC to continue to listen to scientific facts and to disregard  
7 untruthful or scare tactic statements, statements such as DOE is giving \$2 billion loan  
8 guarantee, a misleading statement, because no money exchanges hands. DOE is not giving  
9 AREVA the 2 billion dollars. However, by it being included in the Loan Guarantee program,  
10 AREVA and other companies in that program will be able to possibly receive lower interest  
11 rates. It's like the Good Housekeeping Seal of Approval.  
12

13 **[154-03, Diana Shipley]** They are asking for loan guarantees from the United States  
14 government and I wonder who will be left to clean up the waste and pay the bills if they bail out?  
15

16 **[157-06, Hon. Erik Simpson]** I'd like to address some misconceptions I've read in Idaho's  
17 newspapers, and read on the internet about this project. First, financing. AREVA was recently  
18 awarded a \$2 billion loan guarantee by the Department of Energy. First, a federal loan guarantee  
19 is not a taxpayer loan. It is not a bailout. A federal loan guarantee allows a company like AREVA  
20 to secure a loan from a lender with the credit backing of the United States Government. This  
21 arrangement allows a company to secure a better interest rate.  
22

23 **[168-02, Lon Stewart]** Areva, a French government owned company, should not be subsidized  
24 by the United States to build and operate a plant in the United States. What logical business  
25 person would loan a foreign company \$2 billion dollars to build a plant that WILL have cost  
26 overruns while under construction, where similar projects have a loan default rate of 50%,  
27 where the company can declare bankruptcy and just leave the US., and the company does not  
28 pay any royalties to the US? Doesn't sound good to me.  
29

30 **[180-01, Kaye Turner]** I have nothing but questions that I hope will be answered honestly and  
31 accurately before Areva is given permission to build their plant. Is it true the U.S. government, is  
32 giving this company a \$2 billion loan guarantee to build this nuclear plant? And if Areva fails, we  
33 the tax payers pick up the tab?  
34

35 **[182-03, Brianna Ursenbach]** Assuming that the U.S. uranium fuel supply is insecure, it is  
36 clear that the EREF will not fix it, and although it is not specifically related to the EIS, it is worth  
37 noting that the federal and state tax dollars are being used to subsidize this project. Thus EREF  
38 provides no tangible security improvements to the American people, but it does lay a financial  
39 burden on them.  
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9 species; require the transport of radioactive materials; impair the Hell's Half Acre National  
10 Monument; support destruction of the John Leopard homestead, which has been recommended  
11 for the National Register of Historic Places; devour billions of dollars in state and federal  
12 largess; and obliterate farmland that is potentially protected by the federal government. The  
13 Alliance is here to say it is not worth the risk.  
14

15 **[187-05, John Weber]** Also, the US citizens bear most of the risk by giving the French  
16 company multiple tax benefits and loan guarantees. Is it true the estimated cost of  
17 decommissioning the plant is 3.5 billion U.S. dollars?  
18

19 **[191-26, Liz Woodruff]** Warned by Areva that it probably wouldn't build the enrichment factory  
20 without US taxpayer support, the Department of Energy reached into your pockets to grant the  
21 French-owned company a \$2 billion loan guarantee.  
22

23 **Response:** Section 1703 of Title XVII of the Energy Policy Act of 2005 authorizes the DOE to  
24 support innovative clean energy technologies that are typically unable to obtain conventional  
25 private financing due to high technology risks. In addition, the technologies must avoid, reduce,  
26 or sequester air pollutants or anthropogenic emissions of greenhouse gases. Technologies  
27 considered include: biomass, hydrogen, solar, wind/hydropower, nuclear, advanced fossil  
28 energy coal, carbon sequestration practices/technologies, electricity delivery and energy  
29 reliability, alternative fuel vehicles, industrial energy efficiency projects, and pollution control  
30 equipment. DOE's mission is to accelerate the domestic commercial deployment of innovative  
31 and advanced clean energy technologies at a scale sufficient to contribute meaningfully to the  
32 achievement of national clean energy objectives. A loan guarantee is a contractual obligation  
33 that the Federal Government will cover the debt obligation in the event of a default. In May  
34 2010, the DOE issued a conditional commitment for a Federal loan guarantee to AES for the  
35 proposed EREF. The award of the loan guarantee is contingent on a number of conditions  
36 being met prior to loan closure, including issuance of the NRC license for the EREF. More  
37 information on the DOE loan guarantee program is available at [http://lpo.energy.gov/  
38 ?page\\_id=29](http://lpo.energy.gov/?page_id=29).  
39  
40

41 **Comment:** The following comments stress the importance of the economic boost that the  
42 proposed EREF would have on the Idaho Falls area and the region.  
43

44 **[026-02, Rob Chiles]** Over the last few years, the business community, and members of the  
45 Chamber of Commerce, have shown tremendous support for this important economic  
46 development project. The positive impacts are obvious. With so many America manufacturing  
47 jobs going out of the country, we welcome AREVA's investment and the creation of jobs for U.S.  
48 workers.  
49

1 **[026-03, Robb Chiles]** I appreciate your time and the opportunity to speak to you on this truly  
2 important project. We support your recommendation to grant a license for this project. As Mr.  
3 Packwood so eloquently put in his -- regarding economic benefits, it just makes good business  
4 sense.  
5

6 **[034-07, Greg Crockett]** We do, however, disagree on the scoring of the socioeconomic  
7 impacts. We believe that when you combine the four phases of the project over 30-35 years of  
8 prospective operations, the total economic benefit to the region and state will be much higher  
9 than stated in the Draft EIS.  
10

11 **[038-01, Brian Davidson]** That plant will help Idaho stay on the forefront of nuclear power  
12 technology and add as well as attract badly-needed good-paying jobs to our area of the state.  
13

14 **[039-03 and 039-06, Kreg Davis]** Second, the Areva project is good for the economy, both in  
15 the short and long run. In the short run, it will create many Idaho jobs, both in Idaho Falls and  
16 Boise. A modest estimate of jobs created will number in the thousands. In addition, many more  
17 jobs will be saved. In my industry—my company, my customers, my suppliers, my competitors —  
18 even the State of Idaho’s DBS — I am aware of many Treasure Valley jobs that depend on  
19 Areva’s success.  
20

21 I ask every Boise/Treasure Valley elected official to speak directly with your business  
22 community and especially with anyone in the construction business. We have been among the  
23 hardest hit during these difficult economic times. Ask these businesses and their employees —  
24 your constituents — if Areva’s project will save and create Boise jobs. If you have doubts, call  
25 me. I can introduce you to many Boise/Treasure Valley based businesses and employees who  
26 hope this Areva project is a success.  
27

28 **[041-02, Hon. Tammy de Weerd; 156-02, Robert Simison, on behalf of Hon. Tammy de**  
29 **Weerd]** We do feel that taking the “no action alternative” is not a viable option for the State of  
30 Idaho, and believe, just by looking at the socioeconomic impacts, as others have stated, is valid  
31 reasons why we should move this project forward..  
32

33 I just want to specifically point out that, you know, while the draft EIS does list it as a small  
34 impact, due to the criteria that was used, in the State of Idaho, that part of the region, the 11  
35 counties over there, it is really not a small impact. It has a tremendous impact, here, in the state,  
36 and we believe, as a city, that this will also impact this side of the state, here, in the Treasure  
37 Valley, as we try to work more and more with the products and services that are coming out of  
38 INL, and hope that there will be partnerships that will come from the private industry as well as  
39 the research that’s currently being done at INL, that may answer questions that many people  
40 still might have about nuclear energy and depleted uranium in the future.  
41

42 **[043-01, Rocky Deschamps]** I am going to speak just a little bit, and I won’t take much time.  
43 I’m going to talk a little bit about, I spent six years on the Bingham County Planning and Zoning  
44 Commission, the last two years as chairman of that Commission, and there’s one area here on  
45 the Environmental Impact Statement that I’d just like to maybe touch just a little bit of base on,  
46 and it talks about, it’s anticipated the number of workers moving into the area during each phase  
47 of the proposed project they call them migration workers, that might have some impact on the  
48 schools, health care, law enforcement, availability, cost of public utilities, such as electric, water,

1 sanitary, road, number of migrating workers expected during the construction and operations  
2 might impact the housing.

3  
4 My time on the Bingham County Planning and Zoning, we encourage businesses because our  
5 schools are crying out, we need more students. We're actually declining in our number of youth  
6 in our schools. Our roads are very adequate. Our schools are adequate. We have an  
7 infrastructure here in southeast Idaho because we are so used to having INL, we have the  
8 colleges here that can train the workers. We have the high schools that are there that are ready  
9 to accept anything new that we might have in this area in the schools. We have multiple,  
10 multiple infrastructure in place because of the INL, and the experience we have with the INL out  
11 there.

12  
13 Also, I've been involved with the supply side. We have contractors in this area that are so  
14 familiar with the requirements to build a facility like this, that it's just -- you don't find that in a lot  
15 of areas. We also have suppliers that are used to supplying the specifications, the ASTM  
16 specifications that are required on a nuclear facility to do that, so we are very able to take on a  
17 facility like this, and take care of it, and do what we need to do.

18  
19 **[047-01, Mark Dunham]** I'm excited about the positive impact of the AREVA project. We  
20 believe this will be a major boost to Idaho's employment base, and my members are ready to be  
21 a part of this project, and to assist in any way that we can.

22  
23 I have 840 member companies in Idaho, with close to 200 in Eastern Idaho alone. Idaho's  
24 contractors are ready to help with the construction of necessary infrastructure and facilities for  
25 this important project.

26  
27 On Saturday, Ken Simonson, who's the chief economist of the Associated General Contractors  
28 of America, was in Idaho speaking to my members about the dismal state of the economy. He  
29 told my members that Idaho's construction employment rate is at the same level as it was in  
30 December of 1994. In my industry, it is about jobs, and it is about money, because that  
31 translates into helping your families stay in Idaho, raise their future generations in Idaho. So we  
32 think this will be helpful.

33  
34 As a result, the importance of projects like the AREVA Eagle Rock enrichment plant cannot be  
35 underestimated. Not only will the plant help with our nation's energy situation; it will have a  
36 significant impact on Idaho's economy in terms of jobs.

37  
38 Analysis of this project shows that the project will have economic benefits such as creating  
39 almost 5000 direct, and indirect, jobs through the life of the project. It will also result in billions of  
40 dollars in additional investment into Idaho's economy, and families, at a time the state would  
41 benefit from increased economic development.

42  
43 A George Mason University study commissioned by the AGC of America about infrastructure  
44 investment, in general, says, indicates the construction jobs created would have significant  
45 other impacts on the economy.

46  
47 There would be indirect jobs from supplying construction materials and services. Most jobs  
48 would be in the State of Idaho. There would also be additional jobs created when the

1 construction and supplier workers, and owners, spend their additional incomes throughout the  
2 state's economy.

3  
4 **[054-01, Paul Fullmer]** Areva is good for the community and economy just because for the  
5 simple fact that it is cheaper on the electricity and it produces more jobs for Idaho.

6  
7 **[062-01, Trevor Grigg]** And, you know, I want the same opportunity of prosperity that my  
8 parents have had, and I know that these acquaintances and these friends, they want the same  
9 opportunity of prosperity, and I think that this economic benefit that comes to our state through  
10 this project is huge, and it gives us that opportunity.

11  
12 **[065-02, Hon. Ida Hardcastle]** I spend a large amount of time in the city among the residents  
13 and it is exciting to feel the enthusiasm most have for this project coming to Idaho Falls. Of  
14 course the main interest is the economic impact it will have on the area, in other words - jobs.  
15 Also the community supports the fact that there will be a very small environmental impact from  
16 this facility. We thank the NRC again for their efforts in this particular concern. We have a top  
17 notch workforce here which was recognized by AREVA in the beginning. The community as a  
18 whole supports energy being produced by nuclear power. We simply have to address our  
19 independence on foreign oil.

20  
21 **[073-02, Mark Holzmer]** The Areva project has the potential to significantly improve the  
22 economic base in southeast Idaho – impacts which are not small to moderate, but will have  
23 immediate positive effects on our economy.

24  
25 **[080-01, Don Johnson]** And I would just have to say that I represent a lot of people that this  
26 job would really help. I've lived here all my life. I've raised my family. I've got five grandkids, and  
27 I hope that this would help them in the future find employment, because God knows that we all  
28 need more jobs in this state. So, I would highly recommend that you accept this application.

29  
30 **[098-03, Linda Martin]** The Regional Development Alliance has done several impact studies,  
31 which have been noted in previous instances, and the positive local impact of diversifying the  
32 tax base in Bonneville County is significant. Whereas the current annual tax rolls may reflect an  
33 annual property tax income of a few hundred dollars, the Eagle Rock Enrichment Facility would  
34 bring in approximately \$4 million.

35  
36 We are looking forward to the thousands of jobs during the various phases. While all human  
37 jobs and endeavors are subject to risk, this risk outweighs, by far -- I mean, this risk is  
38 outweighed, by far, by the benefits of this project.

39  
40 As an economic development agency, we are already receiving inquiries from projects  
41 interested in this project, seeking to open new offices, and train and hire new employees.

42  
43 This is a great thing for the economic health of our community and the State of Idaho. Quoting  
44 testimony from the December 08 hearing in Idaho Falls: "We don't need a bailout. We need  
45 AREVA."

46  
47 **[123-03, Hon. Butch Otter; 090-03, Paul Kjellander, on behalf of Hon. Butch Otter; 195-03,**  
48 **Hon. Jeff Thompson, on behalf of Hon. Butch Otter]** First, the Eagle Rock project will

1 provide a much-needed stabilizing economic force in Idaho Falls, and the southeastern Idaho  
2 region. Second, the facility will create much-needed high-quality jobs for the dedicated  
3 workforce in the area. Eagle Rock will create thousands of construction and contractor jobs, and  
4 in 30 years of operation, hundreds of long-term, high-end positions.  
5

6 **[128-01, Bob Poyser]** We welcome this opportunity to provide factual information about our  
7 project to Boise and the surrounding communities. Assuming we are granted a license next  
8 year, those in Boise, who make the trip to Idaho Falls by way of Highway 20, will see the  
9 beginning of an important step towards our nation's energy independence, the development of a  
10 significant investment in Idaho, and construction of an American facility which will provide jobs  
11 to American workers, and strength to the local economy.  
12

13 **[128-07, Bob Poyser]** Eagle Rock will have a significant impact on the local and regional  
14 economy. This facility will create much-needed jobs for Idaho workers. During construction, we'll  
15 create about a thousand jobs locally, and support thousands more regionally. This is a  
16 construction effort that will run for nearly seven years. Within two years from today, AREVA will  
17 begin to hire and train a workforce that will eventually exceed 400 people, to operate and  
18 maintain the Eagle Rock facility over the next 30 years of operating life.  
19

20 We believe this is a positive, is positive news to the many hard-working people in Idaho who are  
21 struggling with difficult economic conditions.  
22

23 **[133-10, Richard Provencher]** For the community of Idaho Falls, the pursuit of this facility will  
24 help bring jobs to the area, and potentially help with workers being displaced from the highly  
25 successful Idaho Cleanup Project as it completes cleanup work. Studies have been performed  
26 on jobs in the area which shows for every new job there is a secondary benefit of 1.8 to the  
27 surrounding community-this will result in even more benefit to the community.  
28

29 **[135-02, Hon. Dave Radford]** We're happy with the prospects. We're optimistic about the jobs.  
30 Serving my third term, and recently running for re-election for my fourth term, the people that I  
31 talked to on the street, it was all about jobs, jobs, jobs. That's what they were interested in, and  
32 how can we promote that, how can we keep the quality of life that we have here in eastern  
33 Idaho, but still further enhance our energy independence?  
34

35 **[137-01, Ralph Reeves]** 1. This plant will add to our exports, which is desperately needed.  
36

37 **[137-03, Ralph Reeves]** 3. This plant will result (in time) in a well trained work force with skills  
38 that can be transferred to other jobs.  
39

40 **[137-04, Ralph Reeves]** 4. This plant will likely foster support establishments which will likely  
41 result in exports and well trained workers.  
42

43 **[155-02, Jerry Shivly]** It was going to help Idaho Falls, because it was going to produce jobs.  
44 And at that time, even in 2008 jobs were starting to fall off. And it's going to energize Idaho Falls  
45 because every time new people come, they bring some of themselves. And we get together and  
46 find out that we are better, and that we have a better product amongst us. The arts thrive, the  
47 schools thrive, and we all thrive. And I am very much in favor of AREVA coming to Idaho Falls.  
48



1 **[185-01, Wade Virgin]** What would AREVA do? My understanding is, and I hope my figures  
2 are correct, it would bring 800 to 1,000 jobs to this area for construction, with several hundred  
3 other jobs coming afterwards. I spent some time not long ago on the internet, and looked at  
4 some of their jobs, and how well they pay. There would not only be jobs, there would be  
5 secondary jobs that would be brought to this area.  
6

7 I guess I can only say, and be brief in saying it, but I fully support, in fact, I strongly encourage  
8 the application be approved for AREVA located here in the Idaho Falls area.  
9

10 **[163-01, Cindy Smith-Putnam]** On behalf of Grow Idaho Falls, and although you and others  
11 have already done a good job capturing it in the process leading up to the Draft EIS, I simply  
12 cannot overstate the positive socioeconomic impacts this project would bring. Even now in this  
13 very early stage, we are already seeing transportation improvements easing the flow of current  
14 traffic along U.S. Highway 20 corridor, and that's because we've asked our officials to  
15 anticipate, plan for, and assess these future needs, and to address them in advance. But when  
16 it comes to economic development, this project's significance reaches far beyond the obvious  
17 direct impact of jobs creation, dramatic expansion of tax revenues for our cash strapped state,  
18 infrastructure development, and the multiplier effect of all of those dollars.  
19

20 **[164-01, Timothy Solomon]** The Regional Development Alliance is experienced in doing  
21 economic impact analysis, and I want to congratulate you on the socioeconomics portion of the  
22 EIS, which I'm going to address throughout my comments.  
23

24 We subsequently ran an additional analysis based upon your numbers in the EIS, to see how  
25 those came out, and those job numbers are "right on" in our estimation.  
26

27 The job creation numbers for a region of this size are quite substantial. They are not an  
28 insignificant impact on the state and on our region. 308 preconstruction jobs and  
29 1,687 construction jobs will impact Idaho, in a very positive way, over the years in which those  
30 activities take place. 3,289 direct, indirect, and induced jobs are also very, very significant  
31 throughout the operational period.  
32

33 The direct output effects of more than 315 million in the first full year of operations is not a small  
34 impact, and provides a substantial base of potential business for local suppliers, service  
35 providers, and sole proprietors, a very important part of our economy.  
36

37 Even if the output remains static over a 20 year period, using the numbers in the EIS, the region  
38 would have a base of 6.3 billion in total direct East Coast activity from which to draw for those  
39 business opportunities over that operational period.  
40

41 We do urge the NRC to take another look at your labor income numbers. We think they may be  
42 slightly less than a project of this size, and a region of this size merits. However, if you just take  
43 the 92.4 million that is outlined in the EIS, if you take that out over a 20 year operating history,  
44 assuming no year-to-year change, we estimate nearly \$2 billion of labor income along on that  
45 side of it.  
46

1 The economic impact of AREVA's \$2 billion investment in Idaho is driven by capital investment  
2 that leads to job creation. The Eagle Rock enrichment facility location in eastern Idaho is  
3 absolutely critical to the economic vitality of the region.

4  
5 Real property has improved and begins yielding tax revenues at a much higher level. New  
6 investments are made in tangible personal property that keeps our manufacturing and  
7 processing capabilities and our job infrastructure on the leading edge.

8  
9 Jobs are created; dollars are spent in the local economy. Business to business and business to  
10 consumer transactions increase, real per capita income increase, tax revenues throughout the  
11 area of impact, both direct and indirect, to the investment, increase, and the general economy of  
12 the entire state is strengthened.

13  
14 And with that, we highly encourage you strongly support the issuance of a license, and I thank  
15 you, once again.

16  
17 **[176-03, Hon. Jeff Thompson]** It is estimated the local region will see more than \$5 billion in  
18 economic impact, and 5,000 in direct and indirect jobs will be created throughout the United  
19 States for this contract.

20  
21 **[178-02, Randy Trane]** This is a project that will serve two purposes. It will allow nuclear power  
22 to serve the world and it will help the economy in the Eastern Idaho area with much needed  
23 employment. I have several friends who are experts in the nuclear power industry and they are  
24 telling me that this project will not have any negative impact on the environment in this area.

25  
26 **[190-01, Dave Whaley]** The Idaho State AFL-CIO, representing approximately 24,000 affiliates  
27 across the State of Idaho, would like to go on record in support of the AREVA Enrichment  
28 Service's proposed gas centrifuge uranium enrichment plant being built in Eagle Rock, Idaho.

29  
30 Idaho, like the rest of the United States, is experiencing record high unemployment. The jobs  
31 this site will provide for the construction industry as well as future operation jobs when the  
32 facility is complete will be instrumental in Idaho's economic recovery

33  
34 **Response:** *The NRC acknowledges these comments and appreciates the public participation.*

### 35 36 37 **I.5.20 Environmental Justice**

38  
39 No comments were received on the Environmental Justice section of the Draft EIS.

### 40 41 42 **I.5.21 Accidents**

43  
44 **Comment:** The following comment expresses concern regarding worker safety associated with  
45 accidents at the proposed EREF.

46  
47 **[049-01, Victoria Everett]** But I'm concerned about the workers. It says you're providing jobs.  
48 How safe are these jobs? You know, coal mines provide jobs, but they're not very safe jobs,

1 and, you know, it wasn't addressed, on the safety of the workers. If there is an accident, how  
2 safe are these workers? Who pays for, you know, the damage done to them, and taking care of  
3 their families?  
4

5 **Response:** *The proposed EREF will be designed with a number of features that would protect*  
6 *workers and mitigate the effects of accidents, as described in Section 4.2.15.3 of the EIS. In*  
7 *addition to physical design features such as barriers, ventilation systems, and alarms, an*  
8 *Emergency Plan would be implemented to minimize the consequences of accidents to workers.*  
9 *Liability for payment for damages to workers would depend on the particular circumstances of*  
10 *an accident. AES would be liable for cleanup costs for accident consequences at the proposed*  
11 *EREF.*  
12  
13

14 **Comment:** The following comment asks if AES's Integrated Safety Assessment (ISA)  
15 addresses all credible accident scenarios whereby depleted uranium (or other contamination)  
16 could get into the Snake River Aquifer.  
17

18 **[087-02, Dennis Kasnicki]** Comment 2a: Many attendees expressed concern regarding  
19 contamination, especially depleted uranium, getting into the Snake River Aquifer; *that*, by far,  
20 seemed to be the biggest concern, and rightfully so. Does AREVA's Integrated Safety  
21 Assessment address ALL CREDIBLE accident scenarios whereby depleted uranium (or other  
22 contamination) could get into the Snake River Aquifer? Are the "probabilities" of all such  
23 scenarios deemed at least "highly unlikely", or otherwise meet the requirements of 10 CFR 70?  
24 If so, or if not, this should be loudly and clearly "called out" in the Draft EIS.  
25

26 **Response:** *AES's ISA (AES, 2010b) considered all credible accidents at the proposed EREF.*  
27 *The analysis considered the consequences and the likelihood of each accident sequence.*  
28 *Consequences included offsite impacts on the public and on the environment from airborne*  
29 *releases of UF<sub>6</sub> and other forms of uranium resulting from an accident. Only accidents involving*  
30 *an airborne release can conceivably result in significant quantities of uranium being released*  
31 *because of the physical properties of the uranium materials used in the process. The*  
32 *environmental consequences of UF<sub>6</sub> releases are analyzed in more detail in Section 4.2.18.2 of*  
33 *the EIS. This section analyzes the consequences of a UF<sub>6</sub> release resulting from a terrorism*  
34 *event and concludes that areas contaminated by deposition of airborne plumes of uranium*  
35 *would be cleaned up to levels that would be protective of human health. Cleanup levels would*  
36 *be determined through a risk analysis that would include analysis of a groundwater exposure*  
37 *pathway. Cleanup of surface contamination would minimize possible migration of uranium to*  
38 *the Eastern Snake River Plain Aquifer. Even in the absence of cleanup, it is unlikely that*  
39 *uranium at levels of health concern could reach the aquifer from the surface in the vicinity of the*  
40 *proposed EREF due to adsorption of uranium by soils of greater than 200 m (660 ft) thick*  
41 *overlying the aquifer (see EIS Section 3.7.2.2).*  
42  
43

44 **Comment:** The following comment states that sensitive population exposure scenarios need to  
45 be developed and addressed, not just from a worker standpoint but also from a member of the  
46 public standpoint.  
47

1 **[036-04, Christina Cutler, on behalf of the Shoshone-Bannock Tribes]** Sensitive population  
2 exposure scenarios need to be developed and addressed, not just from a worker stand point but  
3 also from a member of the public stand point.  
4

5 **Response:** *As presented in Section 4.2.15 of the EIS, doses to members of the public are*  
6 *evaluated ranging from a person at the site boundary to the entire collective population within*  
7 *80 kilometers (50 miles) of the proposed EREF site. Health effects from potential exposures*  
8 *were evaluated using State of Idaho or NRC reference values. These values included Idaho's*  
9 *ambient air quality standard for HF (for routine emissions) and radiological exposure limits from*  
10 *10 CFR Part 20. For accidents, the NRC staff used threshold consequence levels for exposure*  
11 *to uranium and HF given in 10 CFR 70.61 and EPA's Acute Exposure Guideline Levels*  
12 *(AEGs). The NRC staff believes that the reference values used are appropriate for evaluating*  
13 *potential health impacts from operation of EREF on potentially impacted populations, including*  
14 *workers, members of the public, and sensitive subpopulations.*  
15  
16

17 **Comment:** The following comment asks about how AES will respond to accident scenarios on  
18 the proposed EREF site and how the public will be informed.  
19

20 **[129-01, Willie Preacher, on behalf of the Shoshone-Bannock Tribes]** A question arose on  
21 safety issues, how AREVA will respond internally to accident scenarios on the proposed site,  
22 and how the public will be informed.  
23

24 **Response:** *AES would respond to an accident in accordance with the EREF Emergency Plan*  
25 *implemented by the EREF Emergency Management Organization. The public would be*  
26 *informed through alert and notification procedures employed by local emergency management*  
27 *organizations, such as fire and police departments, after these organizations are notified of an*  
28 *emergency by the facility.*  
29  
30

31 **Comment:** The following comment is about the SER not being included in the Draft EIS.  
32

33 **[141-03, Peter Rickards]** In addition...  
34

- 35 1) We are not able to double check the downplaying of accidents and terrorism dose to the  
36 public. The Safety Analysis Report (SER) is NOT included in the DEIS! Instead vague  
37 summaries were used touting they would meet legal requirements.  
38

39 In my history of 23 years of being lied to in EIS's, specifics are needed to demonstrate where  
40 you are misinforming the public to the potential REAL environmental impacts of the proposed  
41 plant. It is unacceptable to have an official draft comment period while withholding the MOST  
42 important details!  
43

44 What the DEIS says on webpage 66 of 430 is:

45 "As noted in Section 1.4, some of these issues are analyzed in detail in the NRC's SER and are  
46 only summarized in the EIS. For example, within the area of safety and security, the SER  
47 analyzes the probabilities and consequences of various accidents at the proposed EREF, as  
48 well as measures to prevent those accidents and mitigate their effects. This EIS does not go

1 into the same level of detail, but provides, in Section 4.2.15, an accident analysis for the  
2 purpose of assessing the potential environmental impacts of accidents.”

3  
4 **Response:** *The SER (NRC, 2010b) documents the NRC’s safety review of the proposed EREF.*  
5 *Most of the issues addressed in the SER are not within the scope of the EIS. As pointed out in*  
6 *the comment, the safety review, as opposed to the environmental review covered in the EIS,*  
7 *goes into much more detail on safety-related matters, including potential accidents, as*  
8 *discussed in Section 1.4 of the EIS. Section 4.15 of the EIS provides a summary of the*  
9 *accident analysis in the SER.*

10  
11  
12 **Comment:** The following comment pertains to certain information in the Draft EIS regarding  
13 doses due to accidents.

14  
15 **[141-05, Peter Rickards]** 3) While assuming the HEPA filters contain most of an accident  
16 nuclear criticality, the DEIS does admit that a citizen at the fence line could receive a 570 mrem  
17 dose, way above the 10 mrem annual limit! (Table 4-30, p 372/430). This dose seems not used  
18 when dismissing transport accidents in metropolitan areas.

19  
20 **Response:** *The 10 mrem/yr dose constraint is only applicable to routine facility operations. It is*  
21 *not applicable to accident scenarios. In addition, the criticality event analyzed in Section 4.2.15*  
22 *of this EIS is not applicable to the impacts of transportation of UF<sub>6</sub> or low level waste analyzed*  
23 *in the EIS.*

24  
25  
26 **Comment:** The following comment requests certain information on accidents and problems at  
27 the Metropolis, Illinois, Honeywell facility.

28  
29 **[141-07, Peter Rickards]** 5) While I have found some great contradicting documents on the  
30 NRC website, I was unable to find details on accidents and problems at current uranium  
31 enrichment plants, including the Metropolis, Illinois Honeywell facility.

32  
33 Please address the statement of Hydrogen explosions recently at the Honeywell uranium  
34 enrichment facility from the article pasted below. Page 370/430 lists only 5 accident types  
35 analyzed, which all seem to qualify for ignoring by probability math tricks. However, this article  
36 mentions locals hospitalized from inhalation problems from Dec 2003. While NRC likes to dwell  
37 on estimated death rates, the public needs to know ALL the potential impacts on their health,  
38 including these scenarios. The article mentions a long problem with compliance at Honeywell,  
39 which appears unaddressed as a potential REAL AND PROBABLE health impact. (See red  
40 highlights) On the NRC website I could see references to Honeywell problems, but the searches  
41 lead to long lists that obscured me finding the details.

42  
43 **Response:** *The Metropolis, Illinois, Honeywell facility is a uranium conversion facility and not a*  
44 *uranium enrichment facility. As such, the processes and events at the Honeywell facility may*  
45 *not be applicable to the processes at the proposed EREF; a hydrogen fire is specifically not*  
46 *relevant to the proposed EREF enrichment process. Hydrogen use would occur only in*  
47 *laboratories at the proposed EREF where it would be used in small quantities under controlled*  
48 *conditions. The NRC review focused on the processes at the proposed EREF.*



1  
2 *The NRC reviewed potential accident sequences that the applicant evaluated as part of the*  
3 *facility ISA. The ISA is performed by the applicant to identify those accident sequences which*  
4 *may have notable consequences (see the performance requirements in 10 CFR 70.61)*  
5 *including long-lasting health effects resulting from exposure to those chemicals associated with*  
6 *NRC-licensed materials. In addition, the NRC independently evaluated certain accident*  
7 *analyses to both verify the adequacy of the evaluations performed by the applicant and to*  
8 *determine the potential impact to the public as pertinent to the EIS. A summary of the ISA was*  
9 *submitted to the NRC as part of the license application and reviewed by staff to provide*  
10 *reasonable assurance that the proposed operations will be conducted in a manner that assures*  
11 *public health and safety and protects the environment. That review is not part of the EIS, but*  
12 *was performed as part of the application review and documented in the Safety Evaluation*  
13 *Report (NUREG-1951) (NRC, 2010b).*

14  
15  
16 **Comment:** The following comment asserts that there are certain issues that the criticality  
17 analysis does not address.

18  
19 **[141-02, Peter Rickards]** Specifically, the criticality analysis does not address the microscopic  
20 particle size problem from criticalities, nor the “alpha recoil” problem with HEPA filters for normal  
21 operations, nor the fire problems with HEPA filters.

22  
23 **Response:** *With regard to the criticality analysis, as reported in Chapter 5 of the SER (NRC,*  
24 *2010b), NRC staff used dose conversion factors for particulates consistent with both*  
25 *10 CFR Part 20 and International Commission on Radiological Protection (ICRP) Publication 30.*  
26 *ICRP 30 recommends use of a 1 micron activity median aerodynamic diameter (AMAD) particle*  
27 *size when the particle size is unknown. Dispersion modeling of releases is consistent with*  
28 *NUREG/CR-6410 and previous evaluations.*

29  
30 *With regard to alpha recoil problems, the staff recognizes that enriched uranium is a low specific*  
31 *activity material and there have been no apparent issues with alpha recoil for uranium materials.*

32  
33 *Fire hazards and the potential consequence of fires are addressed in the facility ISA. NRC staff*  
34 *reviewed the ISA summary and found the risks to be adequately controlled. The NRC staff*  
35 *concluded that there is reasonable assurance that the proposed operations will be conducted in*  
36 *a manner that ensures public health and safety and protects the environment, as reported in*  
37 *Chapter 7 of the SER (NRC, 2010b).*

38  
39  
40 **Comment:** The following comment expresses concern about the threat to air quality in the  
41 event of an accidental release of radioactive material.

42  
43 **[100-02, Wendy Matson; 184-12, Kitty Vincent; 191-18, Liz Woodruff]** The amount of  
44 radioactive material that will be present on the proposed site represents an implicit severe threat  
45 to air quality in the event of an accidental release of radioactive toxins.

46  
47 **Response:** *The human health consequences of representative accidents that involve releases*  
48 *of UF<sub>6</sub> to the atmosphere are analyzed in Section 4.2.15.2 of the EIS. Releases from high-*

1 *consequence accidents, which involve the greatest releases of UF<sub>6</sub> to the atmosphere, were*  
2 *analyzed. The analysis concludes that operation of the proposed EREF would pose an*  
3 *acceptably low risk to workers, the environment, and the public from accidents. Air*  
4 *concentrations of uranium and HF would subside quickly after an accident and would not*  
5 *produce lasting effects on air quality.*  
6  
7

8 **Comment:** The following comments express concern about the cleanup costs following an  
9 accident at the proposed EREF.

10  
11 **[049-02, Victoria Everett]** And also, in the case of an accident, who plays for the cleanup?  
12 Who's responsible for that? The State of Idaho? Or is it AREVA? You know, that wasn't  
13 clarified. And in transportation, a truck gets in a wreck, it spills all over the ground. You know,  
14 such cases as that. Say there is a fire, and there's a major disaster at the plant. Who pays for  
15 that? And who pays the doctor bills of the families that have cancer?  
16

17 **[050-10, Joanie Fauci]** Who will pay for all accidents which occur?  
18

19 **Response:** AES would be liable for cleanup costs for accidents at the proposed EREF. Liability  
20 for payment for damages to workers or members of the public, such as cancer-related claims,  
21 would depend on the particular circumstances of an accident.  
22  
23

24 **Comment:** The following comments note the hazardous nature of uranium hexafluoride and the  
25 potential risk from breached containers.  
26

27 **[181-14, Roger Turner]** EIS fails to realistically evaluate container breaches. Moving, stacking  
28 and unstacking cylinders has breached the containers, at the Oak Ridge Facility. The EIS needs  
29 to be realistic about risks, where heavy equipment is in use because accidents and spills will  
30 happen. Inspections are subject to human error and constrained by budgets. Inconsistent  
31 pressure levels in containers are well known. Excess pressure in containers may make them  
32 more susceptible to breaching or corrosion. Corrosion has been found on these containers at  
33 Oak Ridge. The combination of problems were not adequately considered in the draft EIS.  
34

35 The EIS fails to acknowledge toxicity of Uranium (both enriched and depleted) and the risks to  
36 workers and the public when released. As mentioned above, the EIS also failed to consider  
37 extended storage of containers, with additional risk of breached containers, as a result.  
38

39 **[192-04 and 192-10, Lisa Young]** The storage of depleted uranium hexafluoride, which reacts  
40 with water (gas or liquid) to produce two dangerous, corrosive, and soluble compounds, UO<sub>2</sub>F<sub>2</sub>  
41 and HF, is extremely unstable. The production of these compounds presents huge risks in the  
42 storage timeline, as the corrosion of storage cylinders and the possibility for leaks is a very real  
43 reality.  
44

45 **Response:** The cylinder management program to minimize cylinder corrosion is described in  
46 Section 4.2.11.2 of the EIS. Risks to workers and the public of exposure to breached cylinders  
47 are encompassed by the accident scenarios considered in the accident analysis in  
48 Section 4.2.15 of the EIS. The accident analysis considers all credible accidents at the

1 *proposed EREF. The EIS evaluates several representative accident scenarios with*  
2 *intermediate to high consequences. The scenarios analyzed in the EIS encompass the*  
3 *consequences of cylinder handling accidents and releases due to cylinder corrosion and over-*  
4 *pressurization. Regarding the toxicity of uranium, health effects from radiological exposure are*  
5 *presented in Section 3.11.3.2 and from chemical exposure in Section 3.11.3.3.*  
6  
7

8 **Comment:** The following comments are concerned with wildfires in the vicinity of the proposed  
9 EREF. Some commenters believe wildfires could have a major impact while others note the  
10 conditions that would mitigate any major impacts.  
11

12 **[004-01, Anonymous]** I am astonished you are not considering fire in the EIS review. I  
13 suggest you revise your hurried considerations! [http://www.aolnews.com/world/article/thinking-](http://www.aolnews.com/world/article/thinking-the-unthinkable-russian-fires-fan-nuclear-fears/19589710?sms_ss=email)  
14 [the-unthinkable-russian-fires-fan-nuclear-fears/19589710?sms\\_ss=email.](http://www.aolnews.com/world/article/thinking-the-unthinkable-russian-fires-fan-nuclear-fears/19589710?sms_ss=email)  
15

16 **[015-21, Beatrice Brailsford; 088-09, Stan Kidwell; 122-05, Kathy O'Brien; 127-02, Sheila**  
17 **Plowman]** The NRC should address both Areva's failure to comply with the Federal Farmland  
18 Protection Act and its own failure to fully analyze the environmental effects of a large range fire  
19 at the Areva site.  
20

21 **[027-04, Sara Cohn]** Similarly, we are concerned that fire is not addressed as a potential  
22 threat, when fuels exist on site and fires have recently been burning in the region.  
23

24 **[048-02, Genevieve Emerson]** The EIS fails to consider the influence of wild fires in the region  
25 and also fails to adequately address the issue of waste storage and disposal, considering that  
26 there are no viable methods yet in existence for safely storing hexafluoride and depleted  
27 uranium.  
28

29 **[066-05, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 3.  
30 Wildfires on the Snake River Plain and specifically the Idaho National Laboratory (INL) occur  
31 with surprising regularity and typically burn tens of thousands of acres before being  
32 extinguished (two such fires in 2010). Wildfires have threatened DOE facilities and caused  
33 facility shutdowns due to particulate clogged air exchange filters; low visibility and destruction of  
34 overhead power lines. The EIS should discuss the risk, potential environmental impacts from  
35 wildfires, and safety procedures to be implemented to guard against potential releases as they  
36 relate to the enrichment facility and the depleted UF6 storage cylinders.  
37

38 **[067-09, Mike Hart]** With respect to the half-acre lava field, I think it actually protects this facility's  
39 location from fires, because fires, typically, are drawn by wind, the wind pushes fire down wind,  
40 with a big, huge lava barrier, there's less likelihood of a fire hitting the grounds because it has to go  
41 through the lava first.  
42

43 **[070-04, Virginia Hemingway]** As has been mentioned, we just escaped a fire that could have  
44 totally decimated the INL, which is just almost right next to your facility, that you're -- that the  
45 AREVA is planning. And in Russia, they are currently trying to control a fire that is coming very  
46 close to where Chernobyl melted down, and, in fact, their emergency minister had this to say  
47 about it.  
48

1 He said that the heat from the fires in the region, which already has nuclear contamination from  
2 the Chernobyl disaster, more than 20 years ago, could release harmful radioactive particles into  
3 the atmosphere. In the event of a fire there, radionuclides could rise into the air, together with  
4 combustion particles, resulting in a new pollution zone. And he said this on state television in  
5 Russia.  
6

7 **[152-04, Steven Serr]** We have--we've reviewed the issues as far as fire code protection. We  
8 expressed concern over the safety on site, have they the ability to fight fires? AREVA has opted to  
9 petition in to the fire district. We've had planning meetings with the fire district. We have another  
10 planning meeting, this week, to work out responses in case of wildland fires coming in. We've  
11 addressed safety setback issues to protect the facility. We don't have any real concerns to be able  
12 to protect this facility from wildland fires with the implementation measures that they are planning  
13 on putting in place, along with the expansion of the fire service facilities, and staff, and buildings  
14 and equipment, to be able to provide that fire protection.  
15

16 **[152-10, Steven Serr]** Some of these issues we brought up were regarding fire risk. We had a  
17 meeting just yesterday with the fire department to discuss fire safety issues out there, response  
18 time, what could be done for defensible space surrounding the operation. We felt we have  
19 addressed the needs for making that site very safe, and protected from any fire hazard that might  
20 occur from a wildfire issue. And, also, the fire district is addressing the potential increased demand  
21 for fire needs, and that they have already acquired land on the west side of Idaho Falls to  
22 construction additional fire stations, to provide additional equipment and support facilities for this  
23 type -- for this plant.  
24

25 **[148-01, Eric Schuler]** Taken as a whole, the EIS suggests that this facility will have a  
26 relatively low impact on the environment. Of course several aspects of this, of the — have been  
27 overlooked in making this conclusion. For instance, as others have already noted, it does not  
28 consider the impact of the exempted preconstruction activities, the high risk of wildfires in the  
29 area, or the lack of an appropriate disposal pathway for depleted uranium. Accordingly, the true  
30 impact of this facility is certainly larger than the DEIS suggests.  
31

32 **[157-09, Hon. Erik Simpson]** Fire. It is my understanding that AREVA is currently securing an  
33 agreement for fire protection at the Eagle Rock Enrichment Facility. Although a wildfire is  
34 something you have to plan for, it is by no means a showstopper for this project.  
35

36 **[169-02, Margaret Stewart]** And there has been inadequate addressing in the EIS of wildfire  
37 threats, and transportation of nuclear material accidents.  
38

39 **[184-10, Kitty Vincent]** This waste and the facility will be threatened by wildfires at the  
40 proposed site. The recent Jefferson Fire at the INL is but the latest example of such threats and  
41 the EIS does not provide a detailed analysis of the threats posed by fire.  
42

43 **[191-14, Liz Woodruff]** Threat Posed by Fire. The draft EIS fails to even consider the threats  
44 associated with wildfires at the proposed site. While the draft EIS looks specifically at the  
45 geology and weather patterns at the site, it does not provide a detailed analysis of the threats  
46 posed by fire, claiming that fires do not occur east of the Idaho National Lab (INL). *The recent*  
47 *example of the Jefferson Fire at and stretching east of the INL (and within 10 miles of the*  
48 *proposed EREF) demonstrates this is a real hazard which warrants specific analysis.*  
49

1 **[193-22, Liz Woodruff, on behalf of the Snake River Alliance]** And my final point before I  
2 reach my conclusions are around fire. Fire poses an unacceptable risk to this facility. This  
3 radioactive waste, and the facility as a whole, will be threatened by wildfires at the proposed  
4 site, yet it is never addressed as an impact relevant to that specific geography in the EIS. The  
5 DEIS does not provide a detailed analysis of the threats posed by fire, and some of you might  
6 recall that just about, oh, three weeks ago, there was a huge fire over at the lab. The draft EIS  
7 specifically says fires often don't occur east of the lab. Well, whoops -- let's go back.

8  
9 Here's the lab and this is east, and that's the fire. So I'm pretty sure that fires occur east of the  
10 lab. 150,000 acres just burned there over Superfund sites. This is the proposed facility. Actually,  
11 if you looked at their map, it might even be a little closer. But this is about 10 miles. The EIS  
12 evaluates earthquake risk specific to this geography. It evaluates flood risk specific to this  
13 geography. It evaluates weather risks specific to this geography. It does not evaluate wildfires  
14 specific to this geography. And it absolutely must.

15  
16 **[192-16, Lisa Young]** Indeed, I hope to see further examination of accident scenarios involving  
17 large wildfires around the facility, as well as accident scenarios involving the transportation of  
18 radioactive substances to and from the facility on our roads and highways.

19  
20 **Response:** *All credible accidents at the proposed EREF, including those initiated by natural*  
21 *events, were considered in the accident analysis. Although wildfires can occur in areas*  
22 *surrounding the facility, an accident associated with a wildfire was not considered a credible risk*  
23 *to the facility due to the nature of the surrounding topography and vegetation (low density, low*  
24 *height), vegetation management measures used onsite, the distance to the controlled area*  
25 *boundary, and the resistance of UF<sub>6</sub> storage cylinders and process structures to fire by their*  
26 *design and materials.*

#### 27 28 29 **I.5.22 Decontamination and Decommissioning**

30  
31 **Comment:** The following comment expresses concern regarding the future decommissioning of  
32 the proposed EREF.

33  
34 **[008-02, Carol Bachelder]** And it's interesting to me, that we're already talking about  
35 decommission, and this isn't even "off the ground" yet. I mean, the plant is set for 30 years,  
36 that's all a nuclear plant can operate, is 30 years, and then you have to take it down, and it sits  
37 there, being radioactive, for how many generations? I don't even know.

38  
39 **Response:** *The proposed EREF is not a nuclear power plant. The proposed EREF site would*  
40 *be returned to free release conditions following the decommissioning process, as discussed in*  
41 *Section 4.2.16 of the EIS.*

42  
43  
44 **Comment:** The following comments relate to the source and adequacy of funding for the  
45 cleanup of the EREF site following cessation of operations of the proposed EREF.

46  
47 **[050-09, Joanie Fauci]** Who will pay for the cleanup of this site?  
48



1 **[066-02, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 1.  
2 Financial Assurance - a. Section 2.1.4.3. states:

3  
4 Decontamination and decommissioning of the proposed EREF would be funded in accordance  
5 with the Decommissioning Funding Plan (DFP) for the proposed EREF (AES, 2010b). The  
6 DFP, prepared by AES in accordance with 10 CFR 70.25(a) and the guidance in NUREG-1757  
7 (NRC, 2006), would provide information required by 10 CFR 70.25(e) regarding AES's plans for  
8 funding the decommissioning of the proposed EREF and the disposal of depleted uranium tails  
9 generated as a result of plant operations. Funding would be provided by AES by means of a  
10 Letter of Credit in accordance with NRC regulations in 10 CFR Part 70 and guidance in  
11 NUREG-1757 (NRC, 2006).

12  
13 However, Section 2.1.4.3 further states:

14  
15 A complete estimate of the wastes and effluent to be produced during decommissioning would  
16 be provided in the Decommissioning Plan that AES would submit prior to the start of the  
17 decommissioning.

18  
19 Please explain how an adequate cost estimate for the Decommission Funding Plan can be  
20 prepared in the absence of a complete inventory/estimate of decommissioning wastes.

21  
22 b. Due to NRC's approval of pre licensing construction activities at the site, DEQ requests NRC  
23 explain in this EIS whether Financial Assurance Mechanisms similar to a "Decommissioning  
24 Funding Plan" and associated financial assurance mechanisms have been required of the  
25 Applicant concerning decommissioning and restoration to unrestricted use should the facility not  
26 receive a license or initiate a business based withdrawal of the license application.

27  
28 **[147-10, Joey Schueler]** 6. The term of this plant is 30 years, after which time the plant will be  
29 decommissioned. This means 30 years of revenues and 50 to 100 to into perpetuity years of  
30 cost and impact on Idaho's wilderness and economy. Will Areva still be paying for this cost? No,  
31 the cost will fall to Idaho taxpayers.

32  
33 **Response:** AES is required by the NRC's regulations under 10 CFR 20.1402 to fund the  
34 cleanup of the proposed EREF site during decommissioning, as discussed in Section 2.1.4.3 of  
35 the EIS. A summary breakdown of the estimated decommissioning costs is provided in  
36 Chapter 10 of the SAR. The majority of the costs (excluding tails disposal) are associated with  
37 the dismantlement, decontamination, processing, and disposal of centrifuges and other  
38 equipment in the Separations Building Modules. These estimates are based on the centrifuge  
39 manufacturer's prior decommissioning experience and current practices for decontamination  
40 and disposal. The DFP must be adjusted periodically at intervals not to exceed three years as  
41 required by the NRC's regulations under 10 CFR 70.25(e), thereby ensuring that the funding  
42 plan is up-to-date using the latest available information.

43  
44 *Should the license application be withdrawn or the license not be granted, no nuclear material*  
45 *would have been present onsite. Thus, the site would have always been available for*  
46 *unrestricted use, and no decontamination or decommissioning would be necessary.*

1 **Comment:** The following comment states that NRC license holders are required to provide  
2 financial assurance for decommissioning.

3  
4 **[157-01, Hon. Erik Simpson]** Historically, nuclear projects being discussed in eastern Idaho  
5 are DOE actions. I just want to remind people, this is not a DOE action. NRC license holders are  
6 required to provide financial assurance for decommissioning. They must prove to the NRC that  
7 funds will be adequate for decommissioning. They must fund it before operations start. The  
8 licensees are required to periodically review and update this funding, and with this license  
9 requirement, there is no chance waste will be left behind, or that Idaho will be left with cleanup  
10 responsibility for the AREVA facility.

11  
12 **Response:** *The information in this comment is accurate.*

13  
14  
15 **Comment:** The following comment asks about the location(s) to which equipment that is to be  
16 removed from, or replaced in, the proposed EREF would be stored or transported.

17  
18 **[129-05, Willie Preacher, on behalf of the Shoshone-Bannock Tribes]** The AREVA  
19 Enrichment Project will be in existence for a number of years, how many shutdowns, equipment  
20 upgrades, or modifications will be anticipated during the life cycle of this process? Where will  
21 equipment that is to be removed or replaced be stored or transported to, will it be left within the  
22 facility or will it be transported out of state?

23  
24 **Response:** *Shutdowns, upgrades, and modifications would be dependent on equipment*  
25 *performance and future design improvements and cannot be accurately determined at this time.*  
26 *Any equipment with radioactive contamination that is not decontaminated for free release after*  
27 *use would necessarily be transported to, and disposed of, at an appropriately licensed LLRW*  
28 *disposal facility. The locations of such facilities would depend on which facilities are licensed at*  
29 *the times of disposal. Information on anticipated wastes generated during operation of the*  
30 *proposed EREF is presented in Section 4.2.11 of the EIS.*

31  
32  
33 **Comment:** The following comments express concern about NRC accepting a letter of credit  
34 from AES as the method of assuring funds for decommissioning of the proposed EREF.

35  
36 **[015-16, Beatrice Brailsford]** The entire conundrum of storage, treatment, and disposal goes  
37 hand in hand with the eventual challenges of decommissioning the EREF. The costs of those  
38 activities are pegged at \$3.5 billion. The NRC, an agency charged with protecting the interests  
39 of US citizens, must not settle for a letter of credit from Areva to cover these costs. At the very  
40 least, the NRC must require a surety bond.

41  
42 **[187-03, John Weber]** In section 10.0, one difference between the AREVA plant and the  
43 National Enrichment Facility is -- this is quoted: "AES will utilize a letter of credit to provide  
44 reasonable assurance of decommissioning funding, rather than a surety bond." Why is that? We  
45 all currently know, after the last financial crisis, that a letter of credit is basically a worthless  
46 piece of paper. They have many risks a couple of them, including insolvency of the Applicant  
47 and insolvency of the bank issuing the letter of credit.

1 **Response:** *A letter of credit to assure funds for decommissioning is an acceptable financial*  
2 *assurance method, as indicated in the NRC's regulations in 10 CFR 70.25(e).*  
3  
4

5 **Comment:** The following comments express concern that restoring the proposed EREF site to  
6 unrestricted use after the end of the license period might not occur because of funding issues.  
7

8 **[083-05, Diane Jones]** How can we expect the company to -- whose financial future is  
9 uncertain, to be able to guarantee that they will bear the cost of treating all that waste and  
10 disposing of all that waste, when the process for disposing of the waste is not even known? This  
11 seems highly reckless to me, and not a very sound economical calculation.  
12

13 **[129-04, Willie Preacher, on behalf of the Shoshone-Bannock Tribes]** Will the cost amount  
14 that has been set aside for the D&D of the facility after the mission is complete be enough and  
15 is there a guarantee that it will have be done and not a facility left standing in the desert west of  
16 Idaho falls.  
17

18 **[154-03, Diana Shipley]** They are asking for loan guarantees from the United States  
19 government and I wonder who will be left to clean up the waste and pay the bills if they bail out?  
20

21 **Response:** *As part of its license conditions, AES would be required to restore the proposed*  
22 *EREF site to unrestricted use. Funding for decontamination and decommissioning would be*  
23 *provided by AES in accordance with the NRC's regulations in 10 CFR 70.25(e), as discussed in*  
24 *Section 2.1.4.3 of the EIS.*  
25  
26

### 27 **I.5.23 Greenhouse Gas Emissions**

28  
29 **Comment:** The comment discusses the importance of enriched uranium in reducing  
30 greenhouse gas (GHG) emissions.  
31

32 **[067-06, Mike Hart]** Also, they took exception with the cause and need for action. I think there's  
33 most definitely a need for this, because there's a need for carbon-free energy. Throughout the  
34 world, I think we've seen that global warming is a significant problem that we need to be paying  
35 attention to, and there's also a demand for growth in nuclear energy. There's a couple of facts I  
36 want to point out why we need nuclear energy, why we need this particular enrichment plant.  
37

38 Carbon dioxide reflects, or absorbs, infrared energy that does not go back out to space. It  
39 makes the planet warmer. That's simply a fact. Carbon dioxide is a greenhouse gas. Levels of  
40 carbon dioxide have gone from 288 parts per million in 1850 to 369 parts per million in the year  
41 2000. It doesn't matter where it comes from. That is a greenhouse gas that is increasing in  
42 concentration. But I'll give you a hint as to where it's coming from: fossil energy. In 1990s, we  
43 annually contribute 6.3 gigatons of carbon dioxide into the atmosphere through fossil  
44 combustion. That's annual, 6.3 gigatons. The concern about 300,000 metric tons, 300,000 tons  
45 of total waste versus 6.3 gigatons in a single year, I view the problem with carbon as much more  
46 significant than the problem with depleted uranium.  
47

1 So, what is a gigaton? Why is that a concern? Well, 2.3 gigatons is one part per million of  
2 carbon dioxide in the atmosphere. So, every year we are steadily increasing carbon dioxide. So,  
3 yes, global warming is occurring. Yes, it's our fault. Yes, carbon puts more of that in the  
4 atmosphere, and I think nuclear energy is a stopgap that will – is worth pursuing. So, yes, there  
5 is a need.  
6

7 Energy demands are increasing worldwide. Currently, the population of the planet is about  
8 4.5 billion. By 2050, that will double, and people are not less energy consumptive. Populations  
9 like China and India used to be in the Third World. They have bought the second world, and  
10 they've placed a firm down payment on the first one. So, energy consumption will go up as the  
11 population goes up, so even if nuclear energy just holds its own at 15 percent, there will be a  
12 need for more nuclear plants, and that means there will be a need for more enriched uranium.  
13

14 **Response:** *The NRC acknowledges the comment and appreciates the public participation.*  
15  
16

17 **Comment:** The following comment asks about the cumulative impact of greenhouse gas  
18 emissions associated with the operation of the proposed facility on air quality and climate  
19 change over the 30-year period of the license.  
20

21 **[140-08, Wendy Reynolds, on behalf of the Bureau of Land Management, Upper Snake**  
22 **Field Office]** What would be the cumulative impact of greenhouse gases emissions associated  
23 with the operation of the facility on air quality and climate change over the thirty year period?  
24

25 **Response:** *GHG impacts associated with the proposed EREF are discussed in Section 4.2.17*  
26 *of the EIS. Impacts from preconstruction and construction are addressed separately from*  
27 *impacts associated with operation. Workforce commuting, truck shipments of feedstocks,*  
28 *finished enriched product and wastes, and onsite fossil fuel consumption in support of*  
29 *operations are all considered for their contributions to GHG emissions during facility operation.*  
30 *Conservative assumptions were applied wherever possible (e.g., it was assumed that the*  
31 *majority of the workforce commuted from Idaho Falls and that no carpools or vanpools would be*  
32 *used) to ensure that a maximum possible GHG emission (i.e., a bounding condition) was*  
33 *calculated. However, for simplicity, all GHG emissions were represented as carbon dioxide*  
34 *(CO<sub>2</sub>) equivalents (CO<sub>2</sub>-e).*  
35

36 *Tables 4-35 and 4-36 display the estimated annual emissions of carbon dioxide equivalents*  
37 *(CO<sub>2</sub>-e) (emissions of all of the GHGs produced, represented as CO<sub>2</sub>) associated with*  
38 *workforce commuting and deliveries to and from the proposed facility during operation,*  
39 *respectively. Annual values were calculated, based on the assumptions specified in*  
40 *Section 4.2.17.4. However, although those assumptions collectively represent a feasible*  
41 *condition of operation, the NRC has no basis for assuming that those operational conditions will*  
42 *remain unchanged throughout the life of the facility. Likewise, although the points of origin and*  
43 *destinations of shipments associated with facility operation are feasible for the purpose of*  
44 *defining a bounding condition, the NRC notes that alternative sources of feedstocks as well as*  
45 *alternative destinations for enriched product and wastes also exist. Thus, the NRC staff*  
46 *believes that calculating the cumulative impact of 30 years of operation on the basis of the*  
47 *bounding scenario would be highly speculative and would not yield reliable estimates of*  
48 *cumulative impacts. Further, simply multiplying the values contained in Tables 4-35 and 4-36*

1 *by 30 would be an overly simplistic way of estimating lifetime GHG emissions because it would*  
2 *ignore alternative sources of feedstock, alternative customers for enriched product, and the use*  
3 *of alternative waste disposal facilities, as well as operational changes due to changing market*  
4 *conditions over the proposed facility's lifetime. However, because the assumptions used to*  
5 *define the bounding condition were all intentionally conservative, GHG emissions over the*  
6 *proposed facility's lifetime would be no greater than 30 times the values represented in*  
7 *Tables 4-35 and 4-36.*

8  
9  
10 **Comment:** The following comments raise concerns about the adequacy of the GHG emissions  
11 section of the Draft EIS (Section 4.2.17).

12  
13 **[015-22, Beatrice Brailsford]** With regard to assertions about EREF's role in reducing  
14 greenhouse gas emissions and the claim that EREF will serve as a greenhouse gas "sink," such  
15 reasoning omits the environmental and public health threats caused by EREF's operations, from  
16 uranium mining to disposal of reactor waste and reactor decommissioning. If the EIS takes the  
17 illogical leap of crediting EREF for reducing greenhouse gas emissions, the NRC is compelled  
18 to likewise credit EREF for the documented threats posed by the nuclear power industry  
19 throughout its fuel and waste cycles.

20  
21 **[113-13, Ken Miller]** With regard to assertions about EREF's role in reducing greenhouse gas  
22 emissions and the outlandish claim at Draft 4- 136 that EREF will serve as a greenhouse gas  
23 "sink," such a tertiary benefit (theoretically reducing the operation of traditional coal plants and  
24 as a result their emissions), such reasoning omits the environmental and public health threats  
25 caused by EREF's operations, from uranium mining to disposal of reactor waste and reactor  
26 decommissioning. If the EIS takes the illogical leap of crediting EREF for reducing greenhouse  
27 gas emissions, the NRC is compelled to likewise credit EREF for the documented threats posed  
28 by the nuclear energy industry throughout its fuel and waste cycles.

29  
30 **[153-09, Andrea Shipley; 197-09, Andrea Shipley, on behalf of the Snake River Alliance]**  
31 The draft EIS (4-136) stretches credulity in attaching "Green House Gas sink" attributes to  
32 EREF. The reasoning in the EIS is that the project should be considered a greenhouse sink  
33 because it would produce enriched uranium for use in nuclear reactors that might replace  
34 traditional coal and other fossil fuel plants. By this logic, my car is a GHG sink when I am not  
35 driving it. This tertiary GHG benefit is improper particularly in light of the EIS's failure to  
36 acknowledge the secondary and tertiary environmental and public health threats created by  
37 EREF and its operations, from uranium mining to disposal of reactor waste and reactor  
38 decommissioning. If the EIS credits EREF for such greenhouse gas emission reductions due to  
39 its contribution to nuclear reactors, it must also credit EREF for the known environmental and  
40 health threats that are also attributed to the same nuclear reactors.

41  
42 **[184-14, Kitty Vincent]** The draft EIS (4-136) stretches credulity in attaching "greenhouse gas  
43 sink" attributes to EREF. The reasoning is that the project should be considered a greenhouse  
44 gas sink because it would produce fuel for use in nuclear reactors that *might* replace fossil fuel  
45 plants. This tertiary GHG claim is improper particularly in light of the EIS's failure to  
46 acknowledge the secondary and tertiary environmental and health threats created by EREF and  
47 its operations and the operations of nuclear reactors, from uranium mining to transportation,  
48 disposal of reactor waste and reactor decommissioning.



1 [191-22, Liz Woodruff] The draft EIS (4-136) stretches credulity in attaching “GHG sink”  
2 attributes to EREF. The reasoning in the EIS is that the project should be considered a  
3 greenhouse sink because it would produce enriched uranium for use in nuclear reactors that  
4 might replace traditional coal and other fossil fuel plants. This tertiary GHG benefit is improper  
5 particularly in light of the EIS’s failure to acknowledge the secondary and tertiary environmental  
6 and public health threats created by EREF and its operations, from uranium mining to disposal  
7 of reactor waste and reactor decommissioning. If the EIS credits EREF for such greenhouse  
8 gas emission reductions due to its contribution to nuclear reactors, it must also credit EREF for  
9 the known environmental and health threats that are also attributed to the same nuclear  
10 reactors.

11  
12 **Response:** *The NRC’s analysis of GHG impacts was performed in a manner consistent with the*  
13 *draft Council on Environmental Quality (CEQ) guidance (CEQ, 2010) and addressed only GHG*  
14 *emissions associated directly with production of baseload power. The hypothetical scenario that*  
15 *the NRC staff selected was intended to represent a bounding condition, but is nevertheless*  
16 *feasible because it represents a situation where the entire potential annual output of enriched*  
17 *uranium from the proposed EREF is used to fabricate fuel that is deployed in U.S. reactors. Coal*  
18 *was chosen for comparison because coal currently provides a large percentage of baseload power*  
19 *(in fact, coal combustion for power generation is the largest single source of GHG emissions in the*  
20 *country) and, among the fossil fuels presently used for baseload power production, coal has the*  
21 *greatest GHG footprint (in terms of amount of GHG emitted per kWh of power produced).*

22  
23 *However, the NRC acknowledges here that use of the term “GHG sink” in the EIS was imprecise*  
24 *and a source of confusion. A GHG sink is capable of removing GHGs from the atmosphere and*  
25 *sequestering it indefinitely and not something that prevents the release of GHG. Although*  
26 *objections to the use of the term “GHG sink” may be well founded, the argument clearly made in*  
27 *the EIS text is that use of a nuclear reactor instead of a coal-fired power plant to generate baseload*  
28 *power will avoid the release of GHGs to the atmosphere. Since the NRC cannot control the*  
29 *transmission system operator’s use of the generator dispatch queue, the idea that a nuclear*  
30 *reactor would always be selected in deference to a coal-fired plant must remain hypothetical.*  
31 *However, when such a selection of generating source is made, avoidance of GHG emissions will*  
32 *result.*

33  
34 *With respect to suggestions that other environmental impacts of the nuclear fuel cycle must be*  
35 *introduced into the analysis, these were not considered because the analysis was not intended to*  
36 *be a complete life-cycle assessment. To expand the argument to a full life-cycle assessment*  
37 *would have obligated the NRC to also introduce other environmental impacts across the entirety of*  
38 *the coal fuel cycle. Instead, the analysis was intended to focus only on the matter of GHG*  
39 *emissions related directly to electricity production in a manner consistent with the CEQ guidance.*

40  
41 *To avoid any confusion, NRC has amended the text in Section 4.2.17 to clarify the parameters of*  
42 *its analysis and to focus on a nuclear reactor’s ability to avoid the release of GHG rather than its*  
43 *ability to act as a GHG sink.*

1 **I.5.24 Terrorism**  
2

3 **Comment:** The following comment states the Draft EIS did not estimate the probability of  
4 terrorism.

5  
6 **[141-04, Peter Rickards]** 2) While the DEIS does not address disgruntled employee sabotage,  
7 it at least acknowledges that terrorism could happen, during transport and at the facility. On  
8 page 396/430 the DEIS actually admits that terrorism would equal the full release of a severe  
9 transportation accident. However, the DEIS refuses to estimate the probability of terrorism,  
10 allowing licensing by the usual trick of pretending a severe transport accident will never happen,  
11 using probability math. By hiding behind probability math, the high doses the public can receive  
12 are dismissed as acceptable risk.

13  
14 While the public decides which energy policy is better for their families safety,  
15 windmills/solar/geothermal vs. nuclear power, hiding the profound devastating impacts of these  
16 accidents and terrorism is misleading and unacceptable.

17  
18 **Response:** *The NRC considered a number of potential terrorist scenarios, including those*  
19 *involving disgruntled employees, in its review. The impacts evaluated are representative of a*  
20 *range of what could occur, as presented in Section 4.2.18.2 of the EIS.*

21  
22 *The consideration of terrorism in the EIS does not include an estimate of probability because, as*  
23 *discussed in Section 4.2.18.2, the likelihood of occurrence of any terrorist scenario is*  
24 *speculative and cannot be determined. Thus, there is no discussion of risk, only the*  
25 *presentation of potential impacts should a terrorist attack occur. Section 4.2.18.3 presents a*  
26 *number of potential mitigation measures, to be imposed by the NRC, which would either help*  
27 *avoid or lessen the consequence of such an event.*

28  
29  
30 **Comment:** The following comment questions statements in the Draft EIS regarding the public  
31 health effects of an HF plume at the proposed EREF.

32  
33 **[141-06, Peter Rickards]** 4) Pages 397&8/430 claims an HF plume at the facility may affect  
34 1,900 members of the public, but also claims no fatalities, which seems untrue without detailed  
35 explanation to justify the dismissal of severe impact, including death.

36  
37 **Response:** *As stated in Section 4.2.18.2 of the EIS, the referred 1900 members of the public is*  
38 *for a different DOE facility used as a reference point in the analysis for the proposed EREF,*  
39 *where up to three irreversible health effects were estimated, of which about 1 percent, or fewer*  
40 *than one (0.03), would result in fatality. The text in Section 4.2.18.2 notes that "it is expected*  
41 *that much fewer than 1900 members of the public could be affected in the vicinity of the*  
42 *proposed EREF because the DOE analysis was for a location with a higher population density*  
43 *(>34,000 people within 16 kilometers [10 miles]) than that of the proposed EREF location, which*  
44 *has no appreciable population within 16 kilometers (10 miles)." The risk of fatality would also be*  
45 *correspondingly lower than this already low level.*

46  
47 *Exposure to HF produces a wide range of health effects ranging from irritation of the eye, nose,*  
48 *and skin to possible death depending on the HF concentration in air and duration of exposure.*  
49 *Low-level exposures produce reversible health effects, as described in Section 3.11.3.3 of the*

1 *EIS. The estimated concentrations in HF plumes produced in release scenarios are at sublethal*  
2 *concentrations beyond the proposed EREF site boundary.*  
3  
4

### 5 **I.5.25 Cumulative Impacts**

6

7 **Comment:** The following comment points out the need to address impacts from the proposed  
8 EREF project in the distant future.

9  
10 **[077-02, Larry Hyatt]** I just want to make one point in addition to what I said briefly in Boise,  
11 was -- that is, the issue of stewardship. As you all know, human activity has results that we have  
12 to live with for years, potentially hundreds, and maybe even thousands of years. But it is critical  
13 in an evaluation like this in terms of its environmental impact that we seriously consider the year  
14 5010.  
15

16 **Response:** *As required under NEPA, in the EIS, the NRC staff has assessed all reasonably*  
17 *foreseeable activities and impacts associated with the preconstruction, construction, operation,*  
18 *and decommissioning of the proposed EREF project.*  
19

20  
21 **Comment:** The following comment asks if a redundant source of electrical power is a  
22 requirement for operation of the proposed EREF, if AES has future plans to route a redundant  
23 transmission line, and if a redundant source of electrical power is a reasonably foreseeable  
24 future action that should be addressed in the cumulative impacts section of the EIS.  
25

26 **[140-01, Wendy Reynolds, on behalf of the Bureau of Land Management, Upper Snake**  
27 **Field Office]** 1) A reading of the draft document makes clear that one criterion used to select  
28 the enrichment facility site was the presence of a redundant electrical power supply. It is further  
29 presented in Table 2-3 that the Bonneville County site passed Phase I screening indicating that  
30 there is a redundant power source available for the plant. However, the potential environmental  
31 impacts of the construction and use of a redundant power supply is not discussed under Utilities  
32 (2.1.3.2) (under the Proposed Action), nor is it discussed in the Environmental Impacts section  
33 of the document. The construction and use of a redundant power source is not considered as a  
34 reasonably foreseeable future action under the cumulative impacts section either.  
35

36 These facts lead the BLM to ask: Is a redundant source of electrical power a requirement of the  
37 plants operation? If so, where would the redundant source come from? As you know, areas to  
38 the west of the plant (where a potential source of redundant power is available) are managed by  
39 the Idaho National Laboratory (INL; Department of Energy). Non-mission essential rights-of way  
40 (ROWs) on these lands are administered by the BLM, Upper Snake Field Office. Does AES  
41 have future plans to route a redundant transmission line across INL and BLM-administered  
42 lands?  
43

44 **Response:** *The NRC does not require that the proposed EREF have a redundant source of*  
45 *electrical power, and the absence of a redundant source does not raise a safety issue, as*  
46 *determined by the NRC's safety review. The NRC is unaware of future plans that AES may*  
47 *have regarding a redundant source of electrical power.*  
48  
49

1 **Comment:** The following comment expresses concerns regarding the cumulative impacts  
2 section of the Draft EIS, in particular with regard to the definition of the ROIs for each resource;  
3 the limited discussion of past, present, and reasonably foreseeable future actions that may  
4 contribute to cumulative impacts (particularly for past actions); and the cumulative impact  
5 analysis for the no-action alternative.  
6

7 **[140-05, Wendy Reynolds, on behalf of the Bureau of Land Management, Upper Snake**  
8 **Field Office]** 4) The BLM would also like to express some concerns with the cumulative impact  
9 analysis section of the document. The NRC is correct in citing the regulations at 40 CFR§  
10 1508.7 for the definition of what a cumulative impact is and in discussing the fact that ROI's (we  
11 assume this is equivalent to a cumulative impact assessment area) can, and most likely, would  
12 be different for each resource affected.  
13

14 The primary concerns from the BLM's point of view is that the ROI's are not defined for each  
15 resource, a cumulative impact baseline is not established for each ROI, and there is relatively  
16 little discussion of past, present and reasonably foreseeable future actions that may contribute  
17 to cumulative impacts (particularly for past actions). Although in some cases past and present  
18 actions and their impacts are discussed (although the intensity of the impact is not), the  
19 emphasis seems to be on the reiteration of the direct and indirect impact presentation. Further,  
20 a cumulative impact analysis should be conducted for each resource affected by the proposed  
21 action and no action alternative, which is not evident in this section (for additional guidance,  
22 please refer to the Council on Environmental Quality's [CEQ's] 1997 publication, Considering  
23 Cumulative Effects Under the National Environment Policy Act).  
24

25 **Response:** *Section 4.3 of the EIS defines the ROI radius of the proposed EREF for cumulative*  
26 *impacts for each resource area analyzed as 16 kilometers (10 miles), except for*  
27 *socioeconomics, for which the ROI is defined as 80 kilometers (50 miles). Impacts on*  
28 *resources from past, present and reasonably foreseeable future actions within these distances*  
29 *are analyzed if the actions would affect the resource. Effects on the entire resource are*  
30 *analyzed, even if the resource extends beyond 10 miles, for example, an ecoregion, in the case*  
31 *of the 10-mile ROI. Within the 10-mile ROI, the actual geographic extent of effects may be less*  
32 *than 10 miles for a given resource. Cumulative impacts are analyzed accordingly within the*  
33 *resource area discussions. The 10-mile and 50-mile ROIs thus represent threshold distances*  
34 *for identifying actions that could contribute to cumulative impacts on resources.*  
35

36 *The cumulative impacts analysis in Section 4.3 considers the impacts of past actions mainly on*  
37 *resources that have been significantly impacted in the past and that will incur additional impacts*  
38 *from future actions, such as soils and ecological resources. For resources with relatively low*  
39 *past impacts, such as air quality, the analysis focuses on incremental impacts from foreseeable*  
40 *actions. A brief summary of major past actions, namely agriculture and the INL, has been*  
41 *added to the introduction of Section 4.3.*  
42

43 *Section 4.3 of the EIS also notes that cumulative impacts associated with the no-action*  
44 *alternative would be generally less than those for the proposed action, with the exception of*  
45 *socioeconomic impacts. Within the 10-mile ROI for all other resources, the no-action alternative*  
46 *would have no impacts, as no other foreseeable actions occur within this distance, and the site*  
47 *would be expected to continue to be used for agriculture. A statement to this effect has been*



1 added to the introduction of Section 4.3. The revised cumulative impacts analysis takes into  
2 account CEQ's guidance (CEQ, 1997) and BLM's NEPA handbook (BLM, 2008).

3  
4  
5 **Comment:** The following comment asks about the cumulative impact to sage grouse from the  
6 implementation of the proposed action and the no-action alternative, and how long the effects  
7 would last.

8  
9 **[140-06, Wendy Reynolds, on behalf of the Bureau of Land Management, Upper Snake**  
10 **Field Office]** What would be the cumulative impact to sage grouse from the implementation of  
11 the Proposed Action and the No Action alternative? How long would the effects last?  
12

13 **Response:** As discussed in Section 4.3.7 of the EIS, the contribution to cumulative impacts  
14 from the proposed EREF project on ecological resources would be SMALL. Text has been  
15 added to Section 4.3.7 to include sage-grouse. The effects would last for the life of the  
16 proposed transmission line and EREF site facilities that would affect sage-grouse. The no-  
17 action alternative would have no impacts beyond current site use for agriculture because no  
18 other foreseeable actions occur within the 10-mile ROI.  
19

20  
21 **Comment:** The following comment asks about the incremental impact on air quality, soil  
22 resources, vegetation, wildlife, and grazing livestock from the periodic releases of small  
23 amounts of uranium hexafluoride (UF<sub>6</sub>) over the 30-year life of the facility.  
24

25 **[140-07, Wendy Reynolds, on behalf of the Bureau of Land Management, Upper Snake**  
26 **Field Office]** What would be the incremental impact on air quality, soil resources, vegetation,  
27 wildlife and grazing livestock from the periodic release of small amounts of UF<sub>6</sub> over the thirty  
28 year life of the facility?  
29

30 **Response:** As discussed in Section 4.3.10 of the EIS, offsite air concentrations of uranium  
31 compounds would be below detection limits and would be expected to have a SMALL impact  
32 over the life of the facility. No measurable incremental impacts of any resource outside of the  
33 proposed EREF security fence would be expected due to the low anticipated emission rate of  
34 uranium from the proposed facility.  
35

36 A conservative calculation estimates that existing (background) uranium soil concentrations, as  
37 listed in Table 3-16 of the EIS, would increase approximately 2 percent (less than the standard  
38 deviation of the soil measurements) immediately outside the proposed EREF security fence if  
39 30 years of uranium emissions from the proposed EREF were considered. If 527 microcuries of  
40 uranium were released on an annual basis, as discussed in Section 4.2.10.2 (AES estimates  
41 actual releases will be about 3 percent of that value), a total of about 15,810 microcuries would  
42 be released over the 30-year life of the facility. Considering a release of that amount, an  
43 increase of about 34 pCi/kg of uranium in the soil would be expected using the atmospheric  
44 dispersion factor in Table 4-17 ( $1.80 \times 10^{-5} \text{ s/m}^3$ ), the deposition velocity of  $1.8 \times 10^{-3} \text{ m/s}$  in  
45 Table E-6, an estimated soil density of  $1.5 \text{ g/cm}^3$ , and a mixing depth of 1 cm. For comparison  
46 with Table 3-16, the value of 34 pCi/kg is approximately 2 percent of the combined uranium  
47 isotope values and less than the standard deviation of the soil concentration measurements.  
48 Moving further away from the proposed EREF, the corresponding soil concentrations at the



1 *nearest proposed site boundary where grazing could occur would be 20 percent less than the*  
2 *value at the security fence. Thus, the impacts to soil and dependent resources such as*  
3 *vegetation, wildlife, and grazing livestock would be SMALL and immeasurable.*  
4  
5

6 **Comment:** The following comment states that the EIS should provide cumulative risk analysis  
7 regarding the amount of hazardous or toxic materials to be imported and exported across state  
8 lines.  
9

10 **[027-08, Sara Cohn]** The draft EIS should provide cumulative risk analysis regarding the  
11 amount of hazardous or toxic materials to be imported and exported across state lines.  
12

13 **Response:** *Such a cumulative impact analysis is beyond the scope of the EIS, as the ROI for*  
14 *cumulative impacts (i.e., 10 miles) does not extend to the State borders. The risks of*  
15 *transporting materials to and from the EREF and the impacts on waste management from EREF*  
16 *operations under the proposed action alone are analyzed in Sections 4.2.9 and 4.2.11 of the*  
17 *EIS, respectively.*  
18  
19

20 **Comment:** The following comment indicates that economic impacts regarding income and tax  
21 revenues should also be evaluated in the EIS on a cumulative basis.  
22

23 **[124-03, Lane Packwood]** I found it somewhat interesting that the EIS does take kind of a  
24 “sliced bread” approach to income and taxes. They look at one year within preconstruction, one  
25 year in construction, one year of operation, and take a look at what those revenues are, when,  
26 in fact, we would encourage you to look at the length of -- or the lifetime of the facility. That’s all  
27 a cumulative impact.  
28

29 **Response:** *In Section 4.2.12 of the EIS, economic impacts of the proposed EREF are analyzed*  
30 *on an annual basis during both the construction and operation periods of the proposed facility.*  
31 *These benefits would accrue over the life of the facility. Chapter 7 of the EIS (Benefit-Cost*  
32 *Analysis) provides the total (i.e., summed over all years of the project) employment, income,*  
33 *and fiscal impacts of the project.*  
34  
35

36 **Comment:** The following comment recommends that the EIS should consider all sources of air  
37 emissions and determine the contribution of each source to air quality, and that the Final EIS  
38 should include information to allow accurate air quality impacts and mitigation measures and  
39 their effectiveness to be determined.  
40

41 **[138-03, Christine Reichgott, on behalf of the U.S. Environmental Protection Agency,**  
42 **Region 10]** Air quality may also be impacted due to cumulative impacts from surrounding  
43 activities such as agriculture and fire, herbicides to treat invasive plant species, and continued  
44 management of radioactive materials at nearby Idaho National Laboratory. The EIS should  
45 consider all sources of emissions and determine the contribution of each source to air quality -  
46 negative or positive. Because the DEIS does not include refined analysis of emissions from  
47 sources that are utilizing appropriate control technologies and more detailed construction

1 activities and schedules (p. 4-12), we recommend that the final EIS include that information so  
2 accurate air quality impacts and mitigation measures and their effectiveness can be determined.

3  
4 **Response:** *Air quality impact assessments from preconstruction and construction in the EIS are*  
5 *based on all preconstruction- and construction-related information currently available. A more*  
6 *detailed assessment is not possible until a specific construction schedule is developed by AES,*  
7 *and such a schedule will not be available in time for publication of the Final EIS. Nevertheless,*  
8 *it is the NRC's expectation that AES will be required to submit such a schedule, at the*  
9 *appropriate time, to IDEQ and to Bonneville County in pursuit of necessary construction permits*  
10 *and approvals.*

11  
12 *Ambient air quality for Bonneville County for 2008 was summarized in Section 3.5.3.1 of the*  
13 *EIS; all values were below their respective NAAQS values. EPA guidance regarding the use of*  
14 *its AERMOD dispersion model indicates that circumstantial factors such as other sources of air*  
15 *releases in the region of interest need not be quantified, but should be considered in the*  
16 *interpretation of the dispersion modeling results (Federal Register [70 FR 68218]). Appropriate*  
17 *identification and consideration of those other sources of air pollution in the area are provided in*  
18 *Section 3.5.3. Decisions regarding amendment to Idaho's State Implementation Plan (SIP) that*  
19 *might involve installation of a new ambient air quality monitoring station in the area of the*  
20 *proposed EREF project are outside of the NRC's authority and, therefore, outside the scope of*  
21 *the EIS and instead are the province of IDEQ. The NRC staff believes that the expected short*  
22 *duration of NAAQS exceedance does not argue for a long-term commitment to ambient air*  
23 *quality monitoring in this area.*

24  
25  
26 **Comment:** The following comment recommends that the routes for some proposed new  
27 transmission lines be part of their own NEPA process.

28  
29 **[197-15, Andrea Shipley, on behalf of the Snake River Alliance]** It is recommended that the  
30 routes for some proposed new transmission lines be part of its own NEPA process, because of  
31 potential impacts to wildlife and the land.

32  
33 **Response:** *In Section 4.3 of the EIS, the impacts of the proposed new 161-kilovolt (kV) line that*  
34 *would power the proposed EREF are analyzed as cumulative impacts within the ROI of the*  
35 *facility, and as such, analyzed according to the route currently proposed by AES and Rocky*  
36 *Mountain Power. Impacts on wildlife and land use are considered in the analysis. The*  
37 *proposed 161-kV transmission line discussed in the EIS is the only new transmission line for the*  
38 *proposed EREF of which the NRC is aware.*

39  
40  
41 **Comment:** The following comment maintains that the assessment of cumulative impacts in the  
42 EIS should include shipments to and storage and production at the offsite fuel fabrication facility.

43  
44 **[181-17, Roger Turner]** Cumulative effects include Fuel Fabrication. The NEPA requires an  
45 assessment of cumulative impacts of this project. This would include additional shipments,  
46 storage and production at the off-site fuel fabrication facility. Please add this process, risks, to  
47 the cumulative evaluation of Areva plant.

1 **Response:** *Impacts at a fuel fabrication facility are beyond the scope of this EIS, which is for*  
2 *the proposed EREF. Furthermore, the cumulative impacts analysis is concerned with impacts*  
3 *to resources from actions within a geographic ROI around the proposed EREF. No offsite fuel*  
4 *fabrication facility is within the ROI for affected resources.*  
5  
6

7 **Comment:** The following comments express a position that a proposed route for the Mountain  
8 States Transmission Intertie (MSTI) near the proposed EREF is not certain and should not be  
9 included in cumulative impacts.

10  
11 **[113-11, Ken Miller]** Furthermore, the routes for some proposed new transmission lines,  
12 including the proposed Mountain States Transmission Intertie (MSTI), have not been  
13 determined and as such should not be considered as certain future transmission infrastructure.  
14

15 **[184-19, Kitty Vincent; 191-28, Liz Woodruff]** The routes for some proposed new  
16 transmission lines, including the proposed Mountain States Transmission Intertie, have not been  
17 determined and as such should not be considered as certain future transmission infrastructure.  
18

19 **[193-17, Liz Woodruff, on behalf of the Snake River Alliance]** My next point is regarding  
20 transmission issues. The routes of some of the proposed new transmission lines, including the  
21 MSTI intertie, have not been determined. Those routes have not been concluded yet in our  
22 state, and thus should not be considered as certain future transmission infrastructure, as they  
23 are currently in the EIS.  
24

25 **Response:** *The preferred route for the MSTI as identified by project developers is within*  
26 *40 kilometers (25 miles) of the proposed EREF site, and its construction is considered a*  
27 *reasonably foreseeable action affecting socioeconomics within the ROI. Analyzed actions need*  
28 *only be reasonably foreseeable to be included in the cumulative impacts analysis.*  
29  
30

31 **Comment:** The following comments suggest that burying the transmission line to power the  
32 proposed EREF should be considered as an alternative, so as to minimize impacts to wildlife.  
33

34 **[113-05, Ken Miller]** The idea of burying power lines, we believe, needs to be addressed in the  
35 EIS before it's finalized, because we do believe -- we agree with the Department of Fish and  
36 Game -- that there will continue to be harmful impacts to birds, bats, and other wildlife. This is  
37 especially important given impacts of transmission line construction and operation could also  
38 include wildlife disturbance and mortality.  
39

40 Given all of that, we believe that to exempt the transmission work from – as preconstruction,  
41 and to exempt that from the EIS review needs to be reassessed.  
42

43 **[113-12, Ken Miller]** The Draft EIS should analyze the benefit of burying any additional  
44 transmission lines to minimize the known harmful impacts to birds, bats, and other wildlife.  
45

46 **[184-20, Kitty Vincent; 191-29, Liz Woodruff]** The draft EIS should also analyze the benefits  
47 of burying any additional transmission lines to minimize the known harmful impacts to birds,  
48 bats and other wildlife. This is especially important given “impacts of transmission line  
49 construction and operation could also include wildlife disturbance and wildlife mortality.” (4-150)  
50

1 **[193-18, Liz Woodruff, on behalf of the Snake River Alliance]** On another point on  
2 transmission, and this is very key, the DEIS should also analyze benefits of bearing any  
3 additional transmission lines, to minimize the known harmful impacts to wildlife in the area. This  
4 is especially important given that impacts of transmission lines will disturb wildlife and cause  
5 wildlife mortality.  
6

7 **[191-30, Liz Woodruff]** The Idaho Department of Fish and Game, in a response to the NRC  
8 dated April 14, reaffirmed the threats transmission lines would pose to wildlife (draft EIS B-26)  
9 and challenges the methodology of sage grouse and lek analysis in the EIS (B-27),  
10 recommends burying transmission lines, and suggests Areva submit to the NRC for review  
11 plans to mitigate for the expected wildlife impacts. These concerns do not appear to have been  
12 addressed in this EIS.  
13

14 **Response:** *In Section 4.3 of the EIS, the cumulative impacts of a proposed, above-ground,*  
15 *161-kV transmission line that would serve the proposed EREF are analyzed. Additional*  
16 *discussion of the potential effects of the transmission line on sage-grouse has been added to*  
17 *Section 4.3.7. This analysis concludes that the line would have SMALL contributions to*  
18 *cumulative impacts in all resource areas. However, text regarding monitoring of the*  
19 *transmission line right-of-way for avian mortality has been added to Section 6.2.2. Because the*  
20 *line is a small action compared to the proposed EREF, the assessment does not analyze*  
21 *impacts from alternative line designs. In any event, when evaluating the recommendation of*  
22 *IDFG to bury the transmission line, AES determined that it was not practical, safe, or standard*  
23 *utility company practice to bury high-voltage lines, such as the 161-kV line (AES, 2010e).*  
24  
25

26 **Comment:** The following comments express concern that impacts from the transmission line  
27 should be considered as a direct action (i.e., more fully analyzed) rather than a cumulative  
28 impact. The predominant concern expressed is that impacts to wildlife were not adequately  
29 addressed as a result.  
30

31 **[015-19, Beatrice Brailsford]** The NRC's exemption authorizing Areva to undertake  
32 preconstruction activities should not include exempting utilities installations, including  
33 transmission lines and associated substations and other utility infrastructure. Installation of 80-  
34 foot, 161kv transmission lines should not be considered as having "cumulative" impacts but  
35 rather direct impacts that must be analyzed in the EIS. But EREF could not operate without the  
36 transmission line, which is critical to the proposed action. The NRC therefore errs when it  
37 excludes this transmission line from the proposed action.  
38

39 **[113-04, Ken Miller]** Installation of 80-foot tall, 161-kilovolt transmission lines should not be  
40 considered as having cumulative impacts, as referred to in the EIS, but rather direct impacts  
41 that must be analyzed in the EIS. Contrary to assertions, and this is in the Draft EIS 1-10, that  
42 this transmission line is not considered by the NRC to be part of the proposed action. EREF  
43 could not function without the transmission line, which is critical to the proposed action, and  
44 must be considered for its environmental impacts.  
45

46 The Draft EIS is in error when it suggests at page XLV that "impacts from the construction of a  
47 proposed new 161 KV transmission line, a substation, and substation upgrades for the  
48 proposed EREF are addressed as cumulative impacts in this EIS." This action is not under

1 NRC's jurisdiction, according to the EIS, and therefore not considered by the NRC to be part of  
2 the proposed action.

3  
4 We don't believe this is a defensible position. The EIS is replete with positive social and  
5 economic benefits from this project. Erecting 80-foot transmission towers and stringing power  
6 lines between them must be considered for their environmental impacts, just as Idaho's  
7 Department of Fish and Game suggests. And I'll skip through this, and the Fish and Game  
8 reference is in an April 14th letter of response to the NRC, which reaffirmed the threats  
9 transmission lines would pose to wildlife. This is on B-26, 27, and 28 in the EIS, and it  
10 challenges the methodology of sage grouse and lek analysis on the EIS. That's at Draft B-27. It  
11 recommends burying transmission lines, and suggests that AREVA submit to the NRC for  
12 review plans to mitigate for their wildlife impacts.

13  
14 **[113-10, Ken Miller]** On the issue of transmission, the NRC's ill - advised exemption that  
15 authorizes Areva to undertake preconstruction activities as not being part of the proposed action  
16 should not include exempting utilities installations, including transmission lines and associated  
17 substations and other utility infrastructure. Installation of 80-foot, 161-kV transmission lines  
18 should not be considered as having "cumulative" impacts but rather direct and immediate  
19 impacts that must be analyzed in the EIS.

20  
21 Contrary to assertions (DRAFT EIS 1-10) that "this transmission line is not considered by the  
22 NRC to be part of the proposed action," EREF could not function without the transmission line,  
23 which is critical to the proposed action and must be considered for its environmental impacts.  
24 This EIS claims repeatedly that the NRC has no jurisdiction over transmission lines and  
25 therefore new transmission lines should not be considered as part of this EIS. Yet the NRC  
26 claims authority to determine that EREF deserved credit for being a greenhouse gas sink?

27  
28 This is not a defensible position. The EIS is replete with supposed "positive" social and  
29 economic benefits from this project. Erecting transmission towers and stringing power lines  
30 between them MUST be considered for their environmental impacts, just as Idaho's Department  
31 of Fish and Game suggests. Actually, the installation and operation of this transmission line  
32 have everything to do with the proposed action, and the failure of the NRC to consider these  
33 impacts in the EIS phase cannot be defended, particularly given the acknowledgment by Areva  
34 and NRC that impacts of transmission line construction and operation could also include wildlife  
35 disturbance and wildlife mortality. The proposed transmission line route includes potentially  
36 suitable habitat for sage brush obligate species, including migratory bird species. The Idaho  
37 Department of Fish and Game's response to the NRC, dated April 14, reaffirmed the threats  
38 transmission lines would pose to wildlife (Draft EIS B-26) and challenges the methodology of  
39 sage grouse and lek analysis n the EIS (Draft B-27), recommends burying transmission lines,  
40 and suggests that Areva submit to the NRC for review plans to mitigate for the expected wildlife  
41 impacts.

42  
43 **[150-05, Katie Seevers]** In addition to these concerns of effects to the environment, the Idaho  
44 Department of Fish and Game has reaffirmed threats to the transmission lines would pose to  
45 wildlife, which is discussed in the draft EIS, section B-26. With pronghorn antelope, sage  
46 grouse, and excuse me if I pronounce this wrong -- ferruginous hawks, all making their habitat  
47 on the proposed site, wildlife impact should be more closely examined by the NRC.



1 **[153-13, Andrea Shipley]** The EREF could not function without the transmission line, which is  
2 critical to the proposed action. It is recommended that the routes for some proposed new  
3 transmission lines be part of its own NEPA process because of potential impacts to wildlife and  
4 the land.

5  
6 **[197-13, Andrea Shipley, on behalf of the Snake River Alliance]** The EREF could not  
7 function without the transmission line, which is critical to the proposed action.

8  
9 **[184-18, Kitty Vincent; 191-27, Liz Woodruff]** The NRC's exemption that authorizes Areva to  
10 undertake preconstruction activities as not part of the proposed action (draft EIS xxvii) should  
11 not include exempting utilities installations, including transmission lines and associated  
12 substations and other utility infrastructure. Installation of 80-foot, 161-kV transmission lines  
13 should not be considered as having "cumulative" impacts but rather direct impacts that must be  
14 analyzed in the EIS. Contrary to assertions (draft EIS 1-10) that "this transmission line is not  
15 considered by the NRC to be part of the proposed action," EREF could not function without the  
16 transmission line, which is critical to the proposed action.

17  
18 **[184-21, Kitty Vincent]** The Idaho Department of Fish and Game, in a response to NRC dated  
19 April 14, reaffirmed the threats transmission lines would pose to wildlife (draft EIS B-26) and  
20 challenges the methodology of sage grouse and lek analysis in the EIS (B-27), recommends  
21 burying transmission lines, and suggests Areva submit to plans to mitigate for the expected  
22 wildlife impacts. These concerns do not appear to have been addressed in this EIS and must be  
23 addressed before any preconstruction activities are allowed or before this EIS review continues.

24  
25 **[191-30, Liz Woodruff]** The Idaho Department of Fish and Game, in a response to the NRC  
26 dated April 14, reaffirmed the threats transmission lines would pose to wildlife (draft EIS B-26)  
27 and challenges the methodology of sage grouse and lek analysis in the EIS (B-27),  
28 recommends burying transmission lines, and suggests Areva submit to the NRC for review  
29 plans to mitigate for the expected wildlife impacts. These concerns do not appear to have been  
30 addressed in this EIS.

31  
32 **[193-19, Liz Woodruff, on behalf of the Snake River Alliance]** Now this is something that's  
33 considered as a preconstruction impact in EIS, so this isn't given the weight and the technical  
34 impact review, the small, moderate, and large that you saw.

35  
36 But more specifically, in the EIS, in Appendix B, the Idaho Department of Fish and Game affirms  
37 that the threat to transmission lines would be great for wildlife, and they recommend barring  
38 transmission lines and suggest AREVA submit to plans to mitigate for the expected wildlife  
39 impacts. These concerns must be addressed in the EIS, before any preconstruction activities  
40 are allowed.

41  
42 **Response:** *In Section 1.4.1 of the EIS, the reason the NRC staff has analyzed the impacts of*  
43 *the proposed new 161-kV transmission line, that would serve the proposed EREF, as*  
44 *cumulative impacts is provided. However, the transmission line is not exempted from the EIS*  
45 *review. The impacts of this line are analyzed in Section 4.3 as cumulative impacts within the*  
46 *ROI of the proposed EREF. In addition, the environmental review is not diminished by the fact*  
47 *that the impacts of the proposed transmission line are considered under cumulative impacts*  
48 *rather than direct impacts because all impacts within a 16-kilometer (10-mile) ROI of the*

1 *proposed EREF are associated with the facility. Socioeconomic impacts consider additional*  
2 *actions out to 80 kilometers (50 miles).*

3  
4 *The proposed 161-kV transmission line, while considered by the NRC as preconstruction, is*  
5 *analyzed under cumulative impacts as a foreseeable action. Because the line is necessary for*  
6 *operations of the proposed EREF, it is given particular attention in the EIS and its impacts are*  
7 *fully analyzed. The analysis concludes that the proposed transmission line would have SMALL*  
8 *contributions to cumulative impacts, including the cumulative impacts on ecological resources*  
9 *such as vegetation and birds.*

10  
11  
12 **Comment:** The following comments express concern that a license extension for the proposed  
13 EREF is likely and that depleted uranium waste will be left on site after the original 30-year  
14 license period.

15  
16 **[015-05, Beatrice Brailsford]** The most domestic part of the proposal is that the waste will, in  
17 fact, stay here. The plant would produce 320,000 tons of depleted uranium hexafluoride over its  
18 licensed lifetime, and the door is already ajar for the license to be extended. That waste might  
19 be stored on outdoor concrete pads above the Snake River aquifer until the plant is  
20 decommissioned.

21  
22 It's worth noting that New Mexico sharply limits how much, and how long waste can stay at the  
23 plant there. The waste has to be treated before it can be disposed of. Two government-owned  
24 treatment plants are under construction, over budget, and behind schedule. Waste the U.S. has  
25 already accumulated will take a combined 43 years to process.

26  
27 **[015-14, Beatrice Brailsford]** The EREF will produce more than 350,000 tonnes of depleted  
28 uranium hexafluoride (DUF6) over its licensed lifetime, and the door is already ajar for the  
29 license to be extended. That waste would be stored in 25,718 cylinders on outdoor concrete  
30 pads above the Snake River Aquifer as long as the plant operates. DUF6 is both radioactive  
31 and chemically toxic and has to be treated before it can be disposed of. The DOE has built two  
32 plants to treat depleted uranium hexafluoride waste the US has already accumulated. That  
33 treatment will take a combined 43 years to process. A private US corporation is seeking a  
34 license for its own treatment plant. The draft EIS cavalierly dismisses any potential bottlenecks  
35 by stating that the waste could simply be sent to the DOE treatment plants before they're ready  
36 to process it and then their operating lives extended. But it is at least as likely that the DUF6 will  
37 be stored in Idaho for an uncertain length of time above the Snake River Aquifer, a sole source  
38 aquifer for nearly 300,000 people. Storage under these conditions must be fully evaluated under  
39 NEPA.

40  
41 **[045-01, Joan Drake]** I write to oppose the construction of the Areva nuclear power plant. I am  
42 very concerned that the proposed plant would produce an estimated 320,000 tons of depleted  
43 uranium hexafluoride over its licensed lifetime. In view of this, and the fact that its license might  
44 well be extended, indications are that this waste would likely be stored in or near Idaho until the  
45 plant's decommissioning. Even after its removal and treatment, there is no certain disposal  
46 pathway. The Areva plant should not be licensed until regulations are in place for the  
47 environmentally safe disposal of large quantities of depleted uranium.

1 **[086-03, Paula Jull]** Areva's plant would produce 320,000 tons of depleted uranium  
2 hexafluoride over its licensed lifetime, and its license might well be extended. All this waste  
3 might be stored in Idaho until the plant was decommissioned.

4  
5 **[095-05, Linda Leeuwrik]** Areva's plant would produce 320,000 tonnes of depleted uranium  
6 hexafluoride over its licensed lifetime, and its license might well be extended. All this waste  
7 would likely be stored in Idaho until the plant was decommissioned. Even after it is removed and  
8 treated, there is no certain disposal pathway.

9  
10 **[097-01, Bryan Martin]** So based on the capabilities of those facilities, and what's going to be  
11 produced here – well, just based on what's presently in existence, it would take over 22 years to  
12 deconvert all of the existing nuclear waste, leaving at least 22 years of depleted uranium, on site  
13 at Eagle Rock, before anything can be started.

14  
15 And so that's a concern, because then you have 22 years of waste that's sitting on sites, that  
16 can then be shipped off, you know, as time progresses, but with that type of lag, it suggests that  
17 there will be waste present on site past the scheduled lifespan of the facility, that 30 years. And  
18 so that kind of begs the question of, well, are you expecting this to be a license extension? And  
19 so if that is the case, if that's kind of implied, that should be something that should be addressed  
20 and discussed within the EIS before it's finalized.

21  
22 **[122-01, Kathy O'Brien]** I do not want the waste from this plant here in Idaho or anywhere. It is  
23 not clean energy because of the waste both from this plant and from nuclear power plants.  
24 Areva's plant would produce 320,000 tonnes of depleted uranium hexafluoride over its licensed  
25 lifetime, and its license might well be extended. All this waste might be stored in Idaho until the  
26 plant was decommissioned. Even after it's removed and treated, there is no good way to  
27 dispose of it.

28  
29 **[150-02, Katie Seevers]** The draft EIS assumes that the depleted uranium hexafluoride will not  
30 be stored on the site past the license life of the facility. However, it also acknowledges that  
31 Areva may apply for a license extension. I find the lack of a fully developed rule on disposal of  
32 depleted uranium problematic, especially when coupled with the prospect of seismic activity in  
33 the area and the potentiality for a license extension.

34  
35 **[153-06, Andrea Shipley; 197-06, Andrea Shipley, on behalf of the Snake River Alliance;  
36 184-08, Kitty Vincent]** The draft EIS assumes that depleted uranium hexafluoride will not be  
37 stored on site beyond the licensed life of the facility. But it also acknowledges Areva may apply  
38 for a license extension. As a matter of fact, Areva plans to ask federal regulators for permission  
39 to alter the normally required procedure as it ends the manufacturing of nuclear fuel in Virginia  
40 because the company would still use the site for other nuclear activities. (Gentry, The News &  
41 Advance © Copyright 2009). So, what's next for the Idaho facility if an extension is approved?  
42 The NRC must discuss the length of an extension and whether cumulative waste storage would  
43 be allowed.

44  
45 **[175-04, Ellen Thomas]** Areva's plant would produce 320,000 tonnes of depleted uranium  
46 hexafluoride over its licensed lifetime, and its license might well be extended. There is no  
47 certain disposal pathway.

1 [191-12, Liz Woodruff] The draft EIS assumes that depleted uranium hexafluoride will not be  
2 stored on site beyond the licensed life of the facility. But the draft EIS also acknowledges that  
3 Areva may well apply for a license extension. The NRC must discuss the length of a potential  
4 extension and whether or not cumulative waste storage would be allowed.  
5

6 [192-02, Lisa Young] I'm concerned about many different issues surrounding this facility's  
7 Environmental Impact Statement, but today I'll focus on the storage of depleted uranium  
8 hexafluoride waste on site, and the future transportation and storage off site. While the proposal  
9 commits to removing all of the depleted uranium waste from the site, after decommissioning, the  
10 question still lingers. What if they receive a license extension? It's important to analyze the  
11 environmental impact that the storage of this waste on site, beyond the timeline currently  
12 implicated by the proposal, as this is a very real possibility and could result in very different  
13 analyses of the storage of the waste on site.  
14

15 [192-08, Lisa Young] I am concerned about many different issues surrounding this facility's  
16 environmental impact statement, but in the comments that follow I will focus on the storage of  
17 depleted uranium hexafluoride waste on-site, and the future transportation and storage of that  
18 waste off-site. While the proposal commits to removing all of the depleted uranium waste from  
19 the site after decommissioning, the question still lingers: what if they receive a license  
20 extension? It's important to analyze the environmental impact of the storage of this waste on-  
21 site beyond the timeline currently implicated by the proposal, as this is a very real possibility,  
22 and could result in very different analyses of the storage of the waste on-site.  
23

24 **Response:** AES's license for the proposed EREF, if granted by the NRC, would be for a period  
25 of 30 years for construction and operation of the proposed facility. Any extension of the license  
26 would require a separate licensing action by the NRC and a separate environmental review at  
27 the time of the application for license extension.  
28

#### 29 I.5.26 Mitigation

30 Comments on mitigation measures can be found in the Section I.5 subsections specific to the  
31 applicable resource areas.  
32

#### 33 I.5.27 Environmental Measurement and Monitoring Programs

34  
35 **Comment:** The following comment asks why the Draft EIS references NRC Regulatory Guide  
36 Revision 1 rather than Revision 2.  
37

38 [066-06 Toni Hardesty, on behalf of the Idaho Department of Environmental Quality] 4.  
39 Several places in the draft EIS reference NRC reg guide 4.15 revision 1 (1979). Please explain  
40 why the NRC does not reference revision 2 (2007).  
41

42 **Response:** The NRC acknowledges that Revision 2 (2007) of Regulatory Guide 4.15 should  
43 have been the proper reference. The reference list of Chapter 6 (Section 6.3) and the text of  
44 Sections 6.1, 6.1.2, and 6.1.8 of the EIS has been revised accordingly.  
45  
46  
47  
48

1 **Comment:** The following comment requests clarification in the EIS concerning how AES will tie  
2 into the appropriate monitoring networks to the maximum extent possible in order to better  
3 delineate INL impacts from impacts of the proposed EREF, as well as understanding the  
4 broader regional impacts.

5  
6 **[066-07, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 5.  
7 The DEQ INL Oversight program works in conjunction with the INL (DOE and contractors) to  
8 monitor soils, air quality, ground water and surface water through a complex monitoring system.  
9 DEQ requests clarification in the EIS concerning how AES will tie into the appropriate  
10 monitoring networks to the maximum extent possible in order to better delineate INL impacts  
11 from AES impacts as well as understanding the broader regional impacts.

12  
13 **Response:** *The NRC staff acknowledges this comment. However, the staff finds that the*  
14 *actions AES has committed to taking with regard to monitoring of soils, air, groundwater, and*  
15 *surface water will be sufficiently protective of the environment. These actions are described in*  
16 *Chapter 6 of the EIS (Environmental Measurements and Monitoring Program).*

17  
18 *When NRC reviews a proposed action, its ability to impose additional requirements and*  
19 *environmental mitigation and monitoring measures beyond those proposed as part of the*  
20 *license application is limited to those with a reasonable nexus to providing protection for*  
21 *radiological health and safety and common defense and security. The NRC can, however,*  
22 *require that the proposed facility be built in accordance with the submitted application, including*  
23 *mitigation and monitoring measures proposed by the applicant that are not specifically required*  
24 *by or directly related to NRC's regulations. Thus, the NRC does have the ability to hold*  
25 *licensees to key mitigation and monitoring measures committed to in their applications and*  
26 *subsequently incorporated in the NRC license directly or by reference.*

27  
28  
29 **Comment:** The following comment questions the locations of some of the deep groundwater  
30 sampling locations on the proposed EREF site, and requests an explanation for why there are  
31 no groundwater sampling wells in the southwest (SW) or south-southwest (SSW) sectors of the  
32 monitoring locations map.

33  
34 **[066-10, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]**  
35 Chapter 6: pp, 6-3, Figure 6-1. Many of the deep groundwater sampling locations are too close  
36 to the facility to ensure detection at depth. Additionally, it is generally accepted that the  
37 groundwater flows in a southwesterly direction. Please explain why there are not groundwater  
38 sampling wells in the SW or SSW sectors of the monitoring locations map.

39  
40 **Response:** *Groundwater sampling wells are located on the proposed EREF property on the*  
41 *basis of the predominant groundwater flow direction, which is from the northeast to the*  
42 *southwest in the vicinity of the proposed EREF. Several of the groundwater sampling points*  
43 *(wells) shown on Figure 6-1 in the EIS, indicated by the number 6, are located in the southwest*  
44 *(downgradient) sector; these are mainly deep wells, but include one shallow well to monitor*  
45 *perched groundwater near the facility. Two wells are located to the northeast (upgradient) of*  
46 *the facility to provide sampling control points. The IDEQ has a statewide network of wells it*  
47 *monitors to evaluate the overall quality of groundwater throughout the State to meet the*  
48 *objectives of the State's Ground Water Quality Protection Act. Any monitoring outside of the*



1 *proposed EREF property boundary, therefore, would occur under the aegis of the State's*  
2 *groundwater quality monitoring program. Section 6.1.5 of the EIS has been revised to include*  
3 *this information.*

4  
5  
6 **Comment:** The following comment requests clarification on whether any gross alpha or beta  
7 measurement over 10 percent of the listed U (uranium) value will be analyzed further, or if there  
8 are specific criteria based on a gross alpha beta screening that will trigger the analysis.

9  
10 **[066-11, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 9.  
11 Chapter 6: pp. 6-4, Table 6-2 states "Isotopic analyses for uranium isotopes (238U, 236U,  
12 235U, and 234U) would commence whenever gross alpha and gross beta activities indicate that  
13 an individual radionuclide could be present in a concentration >10 percent of the specified  
14 concentrations in Table 2 of Appendix B to 10 CFR Part 20." Please clarify whether any gross  
15 alpha or beta measurement over 10% of the listed U value will be analyzed further, or if there  
16 are specific criteria based on a gross alpha beta screening that will trigger the analysis.

17  
18 **Response:** *Should a sample exhibit a gross alpha or beta measurement over 10 percent of the*  
19 *listed uranium value in Table 2 of Appendix B to 10 CFR Part 20, the concentrations of the four*  
20 *specific uranium isotopes would be determined. There are no other screening criteria that will*  
21 *trigger the isotopic analysis (AES, 2010d).*

22  
23  
24 **Comment:** The following comment presents recommendations and questions regarding air  
25 quality monitoring.

26  
27 **[066-12, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]**  
28 Chapter 6: pp. 6-6, Lines 10. , & Fig 6-1, pp. 6-3 describes the environmental monitoring sites.  
29 DEQ has the following recommendations and questions:

- 30
- 31 • There should be an air sampling site on the west side of the property which is nearest the  
32 INL.
  - 33
  - 34 • There should be an air sampling site between the facility and Hwy 20 to the south.
  - 35
  - 36 • The air sampling site on the southern fence of the facility is off-set to the SW and is  
37 approximately 2 km from the road. This may not be a good indicator of off-site public  
38 dose impact at the road and should be relocated.
  - 39
  - 40 • The wind rose for the nearest meteorological tower at MFC on pp. C-9 shows winds from  
41 the SW and SSW to the NE are the predominate direction and magnitude, yet the only  
42 sampling planned in the NE and ENE sectors are one TLD and two groundwater  
43 samples collectively. Please explain why are there no air, soil, or vegetation samples in  
44 the sectors where impacts are most likely to be observed.
  - 45

46 **Response:** *The NRC staff acknowledges this comment. However, the staff finds that the*  
47 *actions AES has committed to taking with regard to monitoring of soils, air, groundwater, and*

1 surface water will be sufficiently protective of the environment. These actions are described in  
2 Chapter 6 of the EIS (Environmental Measurements and Monitoring Program).

3  
4 When NRC reviews a proposed action, its ability to impose additional requirements and  
5 environmental mitigation and monitoring measures beyond those proposed as part of the  
6 license application is limited to those with a reasonable nexus to providing protection for  
7 radiological health and safety and common defense and security. The NRC can, however,  
8 require that the proposed facility be built in accordance with the submitted application, including  
9 mitigation and monitoring measures proposed by the applicant that are not specifically required  
10 by or directly related to NRC's regulations. Thus, the NRC does have the ability to hold  
11 licensees to key mitigation and monitoring measures committed to in their applications and  
12 subsequently incorporated in the NRC license directly or by reference.

13  
14  
15 **Comment:** The following comment requests that the NRC define "sectors" in the cited sentence  
16 in Chapter 6, on page 6-9, line 40 of the Draft EIS.

17  
18 **[066-13, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 11.  
19 Chapter 6: pp. 6-9, Line 40 states "Samples would be collected quarterly from each sector at  
20 locations near the Owner Controlled Area fence line." Please define the "sectors".

21  
22 **Response:** The sectors, shown on Figure 6-1 of the EIS, are the areas identified with the  
23 16 compass directions centered on the proposed EREF. This has been added to the text of  
24 Section 6.1.6.

25  
26  
27 **Comment:** The following comment requests clarification of information regarding  
28 thermoluminescent dosimeters (TLDs) in the cited sentence in Chapter 6, on page 6-10, lines  
29 6–8, and in Figure 6-1 of the Draft EIS.

30  
31 **[066-14, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 12.  
32 Chapter 6: pp. 6-10, Lines 6-8 states "The environmental TLDs would be placed at the Owner  
33 Controlled Area fence line near the UF6 storage cylinders. In addition, two TLDs would be  
34 placed at offsite locations for control purposes". This implies that TLDs are only placed near the  
35 storage pads, but Fig 6-1 shows a network of 15 TLDs at the fence on all sides of the facility.  
36 Please explain which description is correct.

37  
38 **Response:** No implication was intended. TLDs would be placed along the entire fence line.  
39 The text in Section 6.1.7 has been revised to state, "The environmental TLDs would be placed  
40 along the Owner Controlled Area fence line."

41  
42  
43 **Comment:** The following comment recommends a change to the cited sentence in Chapter 6,  
44 on page 6-10, lines 11-12 of the Draft EIS.

45  
46 **[066-15, Toni Hardesty, on behalf of the Idaho Department of Environmental Quality]** 13.  
47 Chapter 6: pp. 6-10, Lines 11-12 states "The TLD along the fence line would provide a  
48 combined reading of background as well as above background readings associated with the

1 UF6 cylinders.” DEQ recommends this statement be changed to read “...provide a combined  
2 reading of background as well as any above background readings associated with plant  
3 operations and cylinder handling and storage.  
4

5 **Response:** The text in Section 6.1.7 in the EIS has been changed as recommended.  
6  
7

8 **Comment:** The following comment expresses caution regarding the potential accumulation of  
9 radioactivity elsewhere in the environment resulting from effluent releases from the proposed  
10 EREF that are within regulatory limits  
11

12 **[087-03, Dennis Kasnicki]** Comment 2b: Regardless of releases to the environment that are  
13 within legal release limits, watch out for this contamination *accumulating* somewhere. Once, a  
14 sewage treatment plant near Nuclear Fuel Services (Erwin, TN) had accumulated a sufficient  
15 amount of HIGH enriched uranium to warrant an HEU license, and the NRC actually considered  
16 licensing that sewage treatment plant as an option!  
17

18 **Response:** The NRC acknowledges the comment regarding the potential accumulation of  
19 radioactivity in the environment resulting from effluent releases from the proposed EREF that  
20 are within regulatory limits. Such accumulations would be monitored and addressed through  
21 the environmental measurements and monitoring program described in Chapter 6 of the EIS.  
22  
23

24 **Comment:** The following comment requests that monitoring data relating to wildlife and plants  
25 be provided electronically to the IDFG within one year of collection.  
26

27 **[089-01, Sharon Kiefer, on behalf of the Idaho Department of Fish and Game]** Ecological  
28 Monitoring: The Department appreciates and supports the improvements in monitoring protocols  
29 resulting from our previous consultation with AES and their contractors. The DEIS documents  
30 the ecological monitoring program that would be carried out in accordance with generally  
31 accepted monitoring protocols of the Department. Under the program, data would be collected,  
32 recorded, stored, and analyzed. We request that monitoring data relating to wildlife and plants  
33 be provided electronically to the Department within one year of collection and will pursue  
34 discussion with AES for this coordination.  
35

36 **Response:** The NRC staff acknowledges that the IDFG will pursue discussion with AES for this  
37 request and coordination.  
38  
39

40 **Comment:** The following comment asks for clarification of what “anomalous” ecological  
41 monitoring results might be and what appropriate efforts would be taken to reconcile them.  
42

43 **[089-02, Sharon Kiefer, on behalf of the Idaho Department of Fish and Game]** Ecological  
44 Monitoring: The DEIS states on page 6-18 lines 4-6, *Procedures would be established, as  
45 appropriate, for data Collection, storage, analysis, reporting, and corrective actions. Actions  
46 would be taken as necessary to reconcile anomalous results (AES, 2010a).* We are unsure what  
47 “anomalous” results might be and what efforts to reconcile them would be appropriate. Please  
48 clarify this issue.  
49

1 **Response:** Generally accepted monitoring practices would be expected to include the  
2 evaluation of data collection and analysis methods and determinations regarding necessary  
3 corrective actions. Anomalous results would be expected to include those that would appear  
4 unlikely based on other results of the ecological monitoring program. Potential actions could  
5 include, for example, modifications of data collection methods.  
6  
7

8 **Comment:** The following comment requests that a statement be inserted in the ecological  
9 monitoring section of Chapter 6 of the EIS, regarding the need to obtain appropriate permits  
10 from IDFG or the FWS to handle, transport, or release wildlife, in order to conduct capture and  
11 releases.  
12

13 **[089-03, Sharon Kiefer, on behalf of the Idaho Department of Fish and Game]** Ecological  
14 Monitoring: Page 6-18 lines 20-22, *Measures would be taken to release any entrapped wildlife.*  
15 While the Department supports this measure, please insert the statement: Appropriate permits  
16 to handle, transport or release wildlife will be obtained from IDFG or USFWS to conduct capture  
17 and releases.  
18

19 **Response:** The NRC staff acknowledges this comment. Section 6.2.2 of the EIS states that the  
20 ecological monitoring program would be carried out in accordance with the requirements of the  
21 IDFG and FWS. However, the staff finds that the actions AES has committed to taking with  
22 regard to ecological monitoring, as described in Section 6.2.2, will be sufficiently protective of  
23 the environment. It is the responsibility of the applicant, AES in this case, to obtain all required  
24 Federal, State, and local permits and approvals for the project.  
25  
26

27 **Comment:** The following comment requests that certain text be inserted in the cited sentence in  
28 Chapter 6, on page 6-18, lines 44–46 of the Draft EIS.  
29

30 **[089-04, Sharon Kiefer, on behalf of the Idaho Department of Fish and Game]** Ecological  
31 Monitoring: On page 6-18 lines 44-46, *Data collected for the ecological monitoring program*  
32 *would be recorded on paper and/or electronic forms. These data would be kept on file for the life*  
33 *of the proposed facility (AES. 20/0).* Please insert and will be provided to IDFG annually (as  
34 mentioned above).  
35

36 **Response:** The NRC staff acknowledges this comment. However, the staff finds that the  
37 actions AES has committed to taking with regard to ecological monitoring, as described in  
38 Section 6.2.2, will be sufficiently protective of the environment. The NRC staff acknowledges  
39 that the IDFG will pursue discussion with AES for this request and coordination, as stated in its  
40 Comment Number 089-01 above.  
41  
42

43 **Comment:** The following comment deals with the monitoring of emissions (radiological and  
44 ambient air) and taking corrective action if air quality standards are not met. Also, the comment  
45 points out that there is no monitoring station close to the proposed facility site.  
46

47 **[138-04, Christine Reichgott, on behalf of the U.S. Environmental Protection Agency,**  
48 **Region 10]** Since the project area and surrounding areas may include sensitive populations

1 such as the elderly and children, it will also be important to monitor emissions (radiological and  
2 ambient air) and take corrective action if air quality standards are not met. Proposed monitoring  
3 strategies should be tailored to local conditions because localized air quality impacts can be  
4 substantial, even though area-wide and/or long term monitoring may show compliance with air  
5 quality standards. The draft EIS indicates that monitoring data from a distant monitoring station  
6 in Pocatello, for example, may not represent accurate air emission at the project site. Further,  
7 there is no monitoring station close to the proposed facility site (p. 4-16).

8  
9 **Response:** *As discussed in Section 3.13 of the EIS, information available to the NRC does not*  
10 *indicate the presence of sensitive populations in the vicinity of the project. Given that air quality*  
11 *impacts are expected to be localized and agricultural activities will continue in the vicinity of the*  
12 *proposed EREF, no populations would appear to be at risk from short-duration, construction-*  
13 *related impacts on air quality, especially since all construction activities would proceed under*  
14 *the auspices of IDEQ-issued permits and Bonneville County-approved mitigation strategies.*  
15 *Decisions regarding amendment to the SIP that might involve installation of a new ambient air*  
16 *quality monitoring station in the project area are outside of the NRC's authority and the scope of*  
17 *the EIS and instead are the province of IDEQ. The expected short duration of NAAQS*  
18 *exceedance does not argue for a long-term commitment to ambient air quality monitoring in this*  
19 *area.*

20  
21  
22 **Comment:** The following comment requests that the applicant include air monitoring and  
23 reporting plans that are specific to the operations of the proposed facility.

24  
25 **[027-16, Sara Cohn]** We request that the applicant include air monitoring and reporting plans  
26 that are specific to the operations of the proposed facility. These plans should include guidance  
27 for public alerts, immediate containment, responsible parties, etc., should air releases be  
28 detected.

29  
30 **Response:** *The IDEQ operating permit to be obtained by AES would specify that procedures*  
31 *will be in place to guarantee the expected performance of the air filter systems through rigorous*  
32 *monitoring, inspection, and maintenance programs and that responses to monitoring data would*  
33 *be in accordance with applicable IDEQ regulations.*

#### 34 35 36 **I.5.28 Benefit-Cost Analysis**

37  
38 **Comment:** The following comments deal with the benefits and costs of the proposed EREF  
39 project.

40  
41 **[025-06, Hon. Sue Chew]** Furthermore, it is my opinion that this uranium enrichment project is  
42 unnecessary and exposes the citizens of Idaho to a potential harm that cannot be offset by the  
43 proposed benefits of such a program.

44  
45 **[039-01, Kreg Davis]** Much has been said about how small money is compared to safety, and  
46 we certainly would all agree with that. However, I would object to the minimization of the  
47 importance of jobs, and jobs in the State of Idaho as it's been characterized. In the last several,  
48 couple of years, 18 months, particularly, there's been a major economic downturn that has hit



1 this state. No one knows more, how more important it is, a job is, than somebody who is losing  
2 it. I've been a first-hand witness of what it's like for people to lose their job, and I would hope  
3 that no one in this room would minimize that in comparison to those people. Certainly still agree  
4 with the safety issue. I would like to thank everyone here for the opportunity to speak in support  
5 of the AREVA-proposed uranium enrichment plant.  
6

7 **[040-04, Collin Day]** But there's just no need to take risks and gamble with things like the  
8 aquifer that, you know, supplies drinking water to some 300,000 people, because 500 people  
9 need jobs. I just--I don't see the point in that.  
10

11 **[067-03, Mike Hart]** With respect to the need, I, looking at global warming, I know there are  
12 obviously impacts of nuclear energy, but the reality is, seven generations from now I think they  
13 won't be worrying as much about depleted uranium as they will be about depleted glaciers,  
14 depleted ice caps, and nuclear energy has a significant benefit. It's not without its warts, it's not  
15 without its impacts, but there is "no free lunch" when it comes to energy.  
16

17 You can conserve, but we do use energy. It is used globally, whether this is a French company,  
18 whether it's used locally, or nationally, the reality is its carbon-free, and that carbon-free  
19 resource is something that is very precious, and until we have alternative technologies that can  
20 produce significant usable quantities of electricity, nuclear is a very positive step in between  
21 now and a carbon-free future.  
22

23 **[068-04, Anne Hausrath]** My husband and I raised our children in Idaho. We are very much  
24 concerned about the current economic climate for their generation, and we believe there's a  
25 responsibility of all of us to provide for that. I don't believe that this plant is adequate -- that the  
26 economic is adequate justification for that.  
27

28 **[074-02, Don Howard]** ...what concerns me most is two things. One is economic impact that  
29 Idaho does need. But the waste from the uranium we don't need. And I would say that the  
30 economic--we need the economic boost that this will bring to the State of Idaho. But I say at  
31 what cost to Idaho?  
32

33 **[088-01, Stan Kidwell]** Areva's plant will do more harm than good to Idaho. Any jobs that  
34 would be gained would not counter the damage, both fiscally and environmentally, that would be  
35 done to Idaho.  
36

37 **[095-01, Linda Leeuwrik]** I would like to voice my very strong opposition to the uranium  
38 enrichment facility that the French company Areva is proposing to build not far from where I live  
39 in South East Idaho. This facility would provide no real benefit or advantage to Idaho, instead  
40 only leaving the waste for us to contend with for many years to come -- contaminating our land  
41 and our water supply and negatively impacting our wildlife.  
42

43 **[128-05, Bob Poyser]** Third. AREVA has, and will continue to incorporate sustainability  
44 features, including the use of lead-certified building standards as a part of the overall effort to  
45 ensure that we deploy our best efforts in creating a facility that is environmentally benign and  
46 respects the site conditions.  
47

48 **[130-02, Park and Sharon Price]** The benefits of this project substantially outweigh the  
49 potential small or moderate impacts identified in the draft EIS.  
50

1 We strongly support your preliminary conclusions that this project deserves to move forward.  
2

3 **[147-04, Joey Schueler]** I am in opposition to the Eagle Rock Uranium enrichment plant being  
4 put in Idaho Falls, Idaho! Although I understand the positive incentive arguments for the  
5 proposed plant, the arguments against the plant far outweigh the rather short term positive  
6 benefits. I think careful consideration should be given to each of the fifteen points I listed below  
7 when deciding whether to take this action. I also doubt many Idahoans know about this action  
8 and should be brought to a larger table of discussion.  
9

10 **[177-01, Hon. T.J. Thomson]** As a Boise City Council Member, I am dedicated to safeguarding  
11 tax payer dollars to assure that every penny spent is spent wisely. Outside of keeping this city  
12 safe, fiscal responsibility is my highest priority. Every city project must be highly scrutinized to  
13 assure we are getting the very best product available. And so, with fiscal stewardship in mind, I  
14 ask that you exercise caution as you move forward with the Areva Plant. Considering the large  
15 amount of state and federal tax dollars that will be invested into the plant, it is vital you assure  
16 taxpayers that all costs regarding the management and disposal of waste are included in your  
17 long-term budgeting process.  
18

19 **[182-04, Brianna Ursenbach]** On balance, it is readily apparent, then, that this facility will not  
20 be beneficial, so no amount of negative environmental impact, degradation, is acceptable. In  
21 conclusion, this facility is not needed, not wanted, and cannot be licensed.  
22

23 **[193-23, Liz Woodruff, on behalf of the Snake River Alliance]** So in conclusion, radioactive  
24 waste poses an unacceptable risk to our state. You heard that the NRC has a cost-benefit  
25 analysis. Well, based on our read and the reading of our members, and other Idahoans, it's very  
26 clear that the costs of this facility are far greater than the benefits, to our public safety, to our  
27 water, to our air, to our land, to wildlife habitat. And this definitely outweighs the hypothetical  
28 and very risk assertion by the NRC, that we need uranium enrichment.  
29

30 AREVA's proposed Eagle Rock enrichment facility will store radioactive waste at the sole  
31 source aquifer for 300,000 people. It will impact sensitive species, require the transport of  
32 radioactive materials, impair a national monument in Idaho, support destruction of a historic site,  
33 devour billions of dollars in state and federal largesse to meet a hypothetical need that does not  
34 yet exist, and obliterate farmland that is potentially protected by the Federal Government.  
35

36 We are here to say this is simply not worth the risks, and new evaluations on the draft EIS are  
37 needed, specifically around preconstruction and transmission issues, and until that time, this  
38 facility should not be licensed.  
39

40 **Response:** *The results of the benefit-cost analysis presented in Chapter 7 of the EIS show that*  
41 *the benefits of the facility outweigh the costs. Although there are potential impacts the costs of*  
42 *which cannot be quantified – impacts to air, water quality, or ecology, for example – these*  
43 *impacts would be SMALL or SMALL-to-MODERATE, and would be unlikely to affect the*  
44 *outcome of the benefit-cost analysis.*  
45  
46

1 **I.5.29 Editorial Comments**

2  
3 **Comment:** The following comments identify typographical errors noted in the Draft EIS.

4  
5 **[228-01, Jim Kay]** The word lightning is misspelled as lightening. (Table 3-10, Storm Events in  
6 the Vicinity of the Proposed EREF Site, Page 3-26)

7  
8 **[228-02, Jim Kay]** There is a typo in DEIS Table 3-15 in the row “Volcanic earthquakes” under  
9 the column “Hazard Level.” The focal depth should be 2.5 mi versus 2.5 ft. (Table 3-15, Hazards  
10 Associated with Basaltic Volcanism on the ESRP, Page 3-41)

11  
12 **[228-03, Jim Kay]** There are typos on the emission factors. The value 2560 should be 2.560  
13 and the value 10,292 should be 10.292. (Table 4-7, NRC’s Estimated Emissions of Criteria  
14 Pollutants Resulting from Operations at the Proposed EREF, Page 4-24)

15  
16 **[228-04, Jim Kay]** A D/Q value (2.43 x 10<sup>-7</sup>) is presented in the first full paragraph with units of  
17 kg per square meters. The units for D/Q values are 1 over square meters (1/m<sup>2</sup>). (Section  
18 4.2.4.2, Facility Operation, Generation and Release of Non-Criteria Chemical Pollutants Related  
19 to EREF Operations, Page 4-27)

20  
21 **[228-05, Jim Kay]** The DEIS specifies that the Retention Basins ...each would have a storage  
22 capacity of about 83,000 cubic meters (76 acre-feet)... should be 67 acre-feet. (Section 4.2.6.2,  
23 Facility Operation, Cylinder Storage Pads Stormwater Retention Basin, Page 4-40, Line 15)

24  
25 **[228-06, Jim Kay]** In the 1st bullet, “apply water twice daily to...” should be twice daily (when  
26 needed) for consistency with DEIS page 5-6, Ecological Resources. (Table 5-1, Summary of  
27 Mitigation Measures Identified by AES for Preconstruction and Construction Environmental  
28 Impacts, Air Quality Page 5-3)

29  
30 **Response:** *The EIS has been reviewed and appropriate revisions have been made as noted in*  
31 *the comments.*

32  
33  
34 **I.6 References**

35  
36 (AES, 2009a) AREVA Enrichment Services, LLC. Letter from Sam Shakir (President and CEO,  
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38 License Application for the Eagle Rock Enrichment Facility,” ADAMS Accession  
39 No. ML091210557.

40  
41 (AES, 2009b) AREVA Enrichment Services, LLC. Letter from Sam Shakir (President and CEO,  
42 AES) to the U.S. Nuclear Regulatory Commission dated June 17. “Subject: Request for  
43 Exemption from 10 CFR 70.4, 10 CFR 70.23(a)(7), 10 CFR 30.4, 10 CFR 30.33(a)(5), 10 CFR  
44 40.4, and 10 CFR 40.32(e) Requirements Governing ‘Commencement of Construction.’”  
45 ADAMS Accession No. ML091770390.

46  
47 (AES, 2009c) AREVA Enrichment Services, LLC. Letter from Jim Kay (Licensing Manager,  
48 AES) to the U.S. Nuclear Regulatory Commission dated October 15. “Subject: Response to

1 Request for Additional Information – AES Eagle Rock Enrichment Facility Exemption Request  
2 Related to Commencement of Construction (TAC L32730).” ADAMS Accession  
3 No. ML092920169.  
4  
5 (AES, 2010a) AREVA Enrichment Services, LLC. “Eagle Rock Enrichment Facility  
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7  
8 (AES, 2010b) AREVA Enrichment Services, LLC. “Eagle Rock Enrichment Facility Integrated  
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11 (AES, 2010c) AREVA Enrichment Service, LLC. Letter from J.A. Kay (Licensing Manager, AES)  
12 to U.S. Nuclear Regulatory Commission dated February 19, 2010. “Subject: Treatment Plan for  
13 Historic Site MW004 and Analysis of Obsidian Artifacts.”  
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15 (AES, 2010d) AREVA Enrichment Service, LLC. Email from J.A. Kay (Licensing Manager, AES)  
16 to S. Lemont (NRC) dated December 17, 2010. ADAMS Accession No. ML103630599.  
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18 (AES, 2010e) AREVA Enrichment Services, LLC. Letter from J.A. Kay (Licensing Manager,  
19 AES) to Sharon W. Kiefer (Assistant Director-Policy, IDFG) dated December 7, 2010, “Subject:  
20 Response to IDFG Comments to NRC Related to the EREF Transmission Line.” ADAMS  
21 Accession No. ML103420579.  
22  
23 (BLM, 2008) U.S. Bureau of Land Management. “National Environmental Policy Act  
24 Handbook.” H-1790-1, January. <[http://www.blm.gov/pgdata/etc/medialib/blm/wo/  
25 Planning\\_and\\_Renewable\\_Resources/NEPS.Par.1442.File.dat/h1790-1-2008-1.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning_and_Renewable_Resources/NEPS.Par.1442.File.dat/h1790-1-2008-1.pdf)> (Accessed  
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27  
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11. ABSTRACT (200 words or less)

AREVA Enrichment Services LLC (AES) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for a license to construct, operate, and decommission the proposed Eagle Rock Enrichment Facility (EREF) near Idaho Falls in Bonneville County, Idaho. If licensed, the proposed facility would enrich uranium for use in commercial nuclear fuel for power reactors. Feed material would be non-enriched uranium hexafluoride (UF6). AES would employ a gas centrifuge process to enrich uranium up to 5 percent uranium-235 by weight, with a planned maximum target production of 6.6 million separative work units (SWUs) per year. The proposed EREF would be licensed in accordance with the provisions of the Atomic Energy Act. Specifically, an NRC license under Title 10, "Energy," of the U.S. Code of Federal Regulations (10 CFR) Parts 30, 40, and 70 would be required to authorize AES to possess and use special nuclear material, source material, and byproduct material at the proposed EREF site.

This Environmental Impact Statement (EIS) was prepared in compliance with the National Environmental Policy Act (NEPA) and the NRC regulations for implementing NEPA (10 CFR Part 51). This EIS evaluates the potential environmental impacts of the proposed action and its reasonable alternatives.

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