

ENVIRONMENTAL ASSESSMENT

**BLUE MOUNTAIN
GEOTHERMAL DEVELOPMENT PROJECT**

**HUMBOLDT COUNTY, NEVADA
PERSHING COUNTY, NEVADA**

DECEMBER 2007

EA NUMBER: NV-020-08-01

Lead Agency:

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It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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NV-020-08-EA-01

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1 INTRODUCTION

1.1 Background

Nevada Geothermal Power Company (NGP) began conducting geothermal exploration activities in 2002 following the approval of an Environmental Assessment (EA) for the "Deep Blue No. 1 Well Project." Initial exploration activities consisted of drilling and flow testing the Deep Blue No. 1 (DB1) geothermal well on public land. In 2004 NGP drilled, and in 2005 redrilled, a second geothermal well, DB2.

In February 2006, the Bureau of Land Management (BLM), Winnemucca Field Office (WFO) approved an EA for another geothermal exploration project which included drilling seven additional geothermal wells and building access roads, as appropriate. The seven currently approved geothermal wells are: 23-14, 63-14, 66-14, 26A-14, 26-14, 28-14, and 38-14 (see Appendix C, Figure 4). Total surface disturbance associated with this exploration project was less than 12 acres.

In 2006, NGP created Federal geothermal unit (Unit #N-82457X) which includes 5,262.34 acres of public land managed by the BLM and 5,732.28 acres of private land (see Appendix C, Figure 3).

In October 2007, NGP's schedule for drilling wells 25-14 and 44-14 was moved up based upon the recent drilling results. NGP's request to drill wells 25-14 and 44-14, in exchange for postponing drilling wells 26-14 and 28-14 until the development Operations Plan is approved, was analyzed under a Determination of NEPA Adequacy (NV-020-08-DNA-04). Under the DNA analysis, wells 26-14 and 28-14 would be drilled under the development Operations Plan analyzed in this EA.

Based on the successful results of exploration activities, NGP has determined that the geothermal resource is capable of commercial production. As such, NGP is proposing the Blue Mountain Geothermal Development Project (Project), which consists of a geothermal power plant, a geothermal well field and a 20-mile 120 kV transmission line in Humboldt and Pershing Counties, Nevada (see Figure 1 on page 5).

1.2 Location and Summary of Proposed Actions

The geothermal component of the proposed project includes the construction and operation of power generation facilities, geothermal fluid production and injection well pads and wells, access roads, geothermal pipelines, and groundwater production wells (see Appendix C, Figure 2). The electrical generation component of the proposed project includes the construction and operation of an electrical transmission line, switching station, and support facilities (see Figure 1 on page 5).

The proposed power plant, geothermal well field, and groundwater production wells would be constructed within the Blue Mountain Geothermal Unit (Unit #N-82457X), which includes both

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federal and private geothermal leases. Four federal geothermal leases are included in the unit agreement: NVN-77668, NVN-80159, NVN-58196, and NVN-80086 (see Appendix C, Figure 3). The only federal lease affected by the proposed project activities is lease NVN-58196. The proposed power plant, and some of the geothermal well field and ancillary facilities, would be located on private lands adjacent to federal lease NVN-58196.

The proposed geothermal operations are located on the western slope of Blue Mountain approximately 25 miles west of Winnemucca in Humboldt County, Nevada, hereafter referred to as the "geothermal operations area" (see Appendix C, Figure 3).

The proposed transmission line would originate at the proposed power plant site and extend south along the eastern foothills of the Eugene Mountains to approximately three miles north of Mill City, Nevada, in Pershing County, where it would terminate at the proposed switching station to be constructed by Sierra Pacific Power Company (SPPCo), hereafter referred to as the "transmission line corridor." (see Figure 1 on page 5).

NGP submitted an application (N-82701) and Plan of Development (PoD) to the BLM, Winnemucca Field Office (WFO), for approval of a right-of-way (ROW) for those portions of the transmission line corridor located on public lands managed by the BLM. SPPCo submitted an application (N-83479) to the BLM WFO for approval of a ROW for the electrical switching station to be built at the point of interconnection of the NGP transmission line with the existing SPPCo transmission line.

NGP also submitted a Utilization Plan for approval of those portions of the utilization facilities located on public lands managed by the BLM and an Operations Plan for approval to drill and test those geothermal wells located on public lands managed by the BLM which would be used for production and injection of geothermal fluid for the Project.

1.3 Purpose and Need

The purpose of the Blue Mountain Geothermal Development Project is to commercially develop the geothermal resources within the federal geothermal unit; to construct and operate a commercial geothermal power plant and wellfield within this unit; and to transport generated electricity from the Project to a power purchaser in compliance with the Nevada State mandated Renewable Portfolio Standard. The purpose of the Project's transmission line and electrical switching station is to provide the electrical interconnection with the existing Sierra Pacific Power Company (SPPCo) electrical transmission system at the proposed junction in an economically viable manner which minimizes transmission line energy losses and adverse environmental impacts. NGP needs to be able to produce geothermal resources in commercial quantities from the Unit or the federal geothermal leases will terminate.

Under the Federal Land Policy and Management Act and its implementing regulations, BLM must respond to the ROW applications. Under the terms of the Geothermal Steam Act and its implementing regulations, BLM must respond to the proposed plans, applications and programs submitted by the lessee or the lessee's designated operator. The BLM is also required to comply with NEPA and the Council of Environmental Quality (CEQ) regulations. The BLM WFO has determined that an Environmental Assessment (EA) would be needed to evaluate and disclose the potential environmental impacts associated with this proposed action and any reasonable alternatives to the proposed action which would include a no action alternative. In evaluating the scope of the proposed action, BLM determined that construction and operation of the geothermal power plant on private land is a connected action as the power plant can not be

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constructed without federal approvals. Consequently, this EA includes an analysis of actions proposed on private lands. (see 40 CFR1508.25 a)(1).

This EA will serve as a decision-making tool to assist BLM in its determination to approve the proposed action or alternative, or require modification or deny the proposed action. At the conclusion of the EA process, the BLM must determine if the proposed action, any modifications of the proposed action and/or alternatives would cause significant environmental impacts to the human environment. If no such impact would occur, then a Finding of No Significant Impact (FONSI) would be prepared, and the BLM would approve the submitted Operations Plan, Utilization Plan and two Right-of-Way applications. If, at any time during the analysis, a determination of significant impacts is made that could not be appropriately mitigated at the EA level, an Environmental Impact Statement (EIS) would be required.

1.4 Relationship to Laws, Regulations, Policies, Other Plans and Other Environmental Analysis

The EA has been prepared in accordance with the following statutes and implementing regulations:

- The National Environmental Policy Act (NEPA) of 1969, as amended (Public Law [PL] 91-190, 42 U.S.C. 4321 *et seq.*);
 - 40 CFR 1500 (*et seq.*). Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.
- USDI requirements (Departmental Manual 516, Environmental Quality [USDI 2004])
- The Federal Land Policy and Management Act of 1976 (PL 94 579, 43 U.S.C. 1761 *et seq.*);
 - 43 CFR 2800, Rights-of-Way, Principles and Procedures; Rights-of-Ways under the Federal Land Policy and Management Act and the Mineral Leasing Act; final Rule, April 22, 2005.
- BLM NEPA Handbook (H-1790 1), as updated (BLM 1988);
- Considering Cumulative Effects under the NEPA [CEQ 1997];
- The Geothermal Steam Act of 1970 (Act) (30 USC 1001-1025).
 - 43 CFR 3200, Geothermal Resources Leasing and Operations; Final Rule, May 2, 2007.
- The 2005 Energy Policy Act;
- The National Energy Policy, Executive Order 13212;
- Best Management Practices as defined in the Oil and Gas "Gold Book", Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development", *Fourth Edition*, (Gold Book);
- The 2002 Geothermal Resources Programmatic Leasing Environmental Assessment prepared by the BLM WFO;
- The 2001 "Deep Blue No. 1 Well Project" EA prepared by the BLM WFO (EA #NV-020-02-06); and
- The 2005 "Blue Mountain Geothermal Exploration Project EA" prepared by the BLM WFO (EA #NV-020-06-EA-06)

1.5 Land Use Plan Conformance

The public land within the geothermal operations area and along the transmission line corridor is administered by the BLM through the Winnemucca Field Office (WFO). The area is subject to the BLM WFO Paradise-Denio Management Framework Plan (MFP), and the Sonoma-Geilach

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MFP, which were adopted in 1982. The MFP's provide for the development of geothermal resources in noncompetitive areas and all Known Geothermal Resource Areas (KGRAs) except those which are areas of significant environmental conflict or have historical and/or cultural significance.

The proposed geothermal operations conform to applicable provisions of the MFPs. Although the transmission line as proposed may present a significant impact on an area of cultural significance, modification(s) of the proposed right of way and transmission line structures would reduce the impact to a level that conforms to the standards of the MFPs.

1.6 Identified Issues

An "Interested Public" letter was mailed on November 3, 2006, announcing the project and seeking public comment through January 5, 2007. A public scoping meeting was held on November 29, 2006 at the BLM WFO office. The scope of this EA is based upon specific issues and concerns identified by BLM, other federal agencies, state agencies, local agencies, and members of the public. These issues and concerns include:

- The quantity and quality of waters on public lands;
- Access to water by wildlife and livestock;
- Migratory birds during the nesting period;
- Visibility of the transmission line; and
- Potential direct and indirect impacts to the setting of the California Emigrant Trail and other cultural trails.

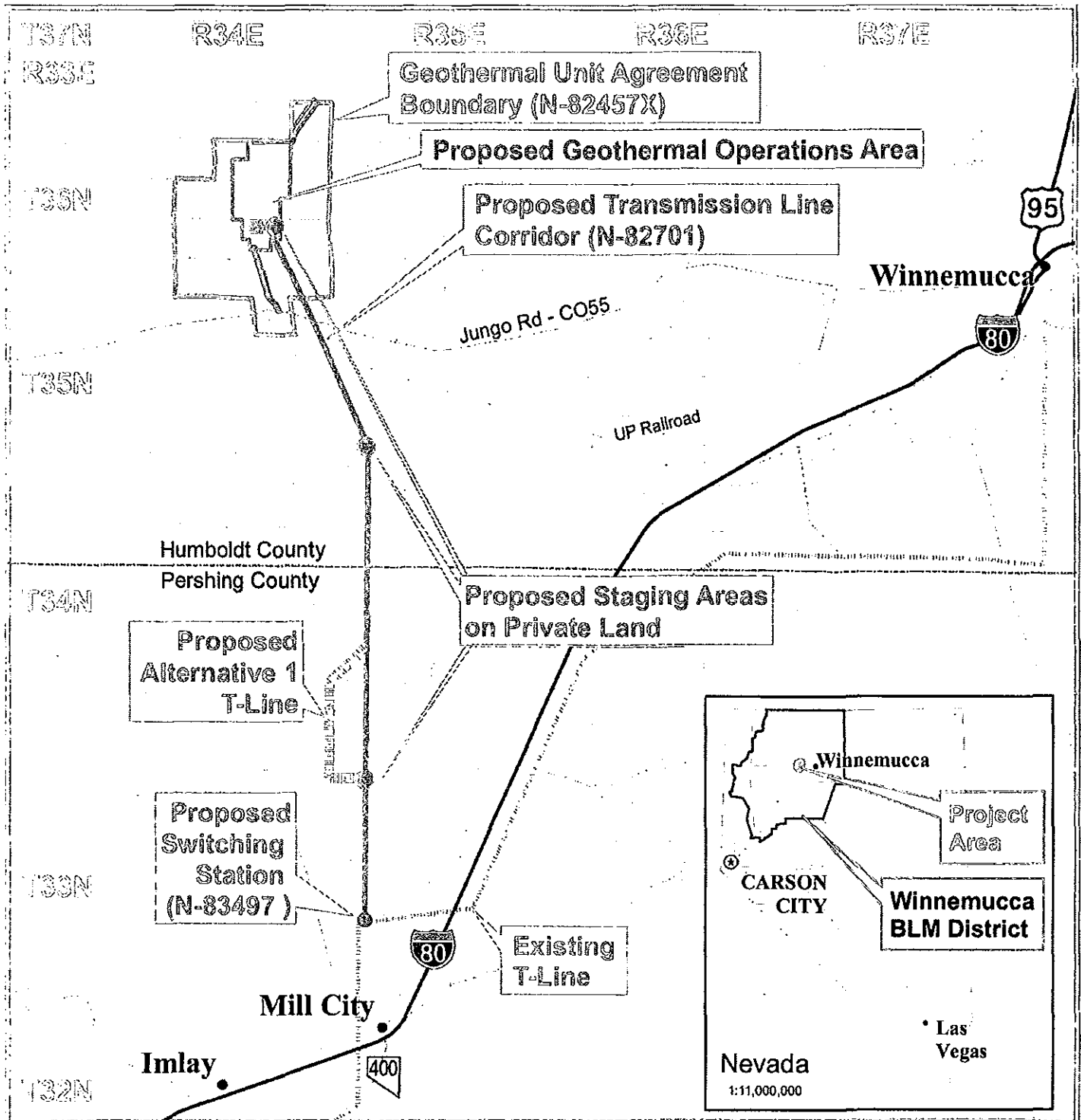










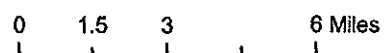


Figure 1: Project Vicinity Map

Project data from NGP - July 2007

-  Proposed Geothermal Operations Area (with Power Plant site shown)
-  Proposed T-Line
-  Switching Station
-  Staging Area
-  Alternative 1 T-Line Route

-  Existing T-Line
-  Geothermal Unit Agreement Boundary
-  BLM
-  Private
-  Water



1:225,000

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No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

Map Date: Oct 24, 2007

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

NGP is proposing a geothermal development project which includes the construction and operation of power generation facilities, geothermal fluid production and injection well pads and wells, access roads, geothermal fluid pipelines, groundwater production wells, an electrical transmission line and switching station, and support facilities.

NGP submitted an application (N-82701) and Plan of Development (PoD) to the BLM, Winnemucca Field Office (WFO), for approval of a right-of-way (ROW) for those portions of the transmission line located on public lands managed by the BLM. SPPCo submitted an application (N-83479) to the BLM WFO for approval of a ROW for the electrical switching station to be built at the point of interconnection of the NGP transmission line with the existing SPPCo transmission line.

An Operations Plan was submitted for approval to drill and test geothermal wells proposed on public land (within federal geothermal lease NVN-58196) which would be used for the project. A Utilization Plan was submitted for approval of utilization facilities proposed on public land to be used for the project. Geothermal Drilling Permits (GDPs) will be submitted for downhole casing and cementing engineering approval for each well as the project progresses.

The submitted ROW applications, Operations Plan and Utilization Plan are required for the BLM to approve those portions of the proposed project activities which are on public lands managed by the BLM, and the project description is arranged accordingly (see sections 2.1.1, 2.1.2, and 2.1.3).

2.1.1 Rights-of-Way

NGP is proposing to construct, operate and maintain an approximately 20-mile overhead 120 kV transmission line, originating at the proposed power plant site and extending along the eastern foothills of the Eugene Mountains to approximately three miles north of Mill City, Nevada. The proposed transmission line would require a 75-foot wide ROW. Land ownership within the ROW is approximately 50% private, and 50% public lands managed by the BLM.

The ROW would originate at the proposed power plant site in the NW1/4NW1/4 of Section 23, T36N, R34E MDB&M, then head southeast to the SW1/4SW1/4 of Section 17, T35N, R35E, crossing approximately 3.1 miles of private lands and 3.6 miles of public lands managed by the BLM (see Figure 1). The ROW then proceeds directly south along the western side of Sections 20, 29 and 32, T35N, R35E; Sections 5, 8, 17, 20, 29 and 32, T34N, R35E; and Sections 5, 8 and 17, T33N, R35E, crossing approximately 6.3 miles of private land and 6.5 miles of public lands managed by the BLM. The ROW terminates in the Government Lot 1 of Section 20, T33N, R35E, where the proposed transmission line would interconnect with the proposed SPPCo switching station and interconnect with the existing 120 kV SPPCo electrical transmission line (see Figure 1 on page 5).

SPPCo has filed an application with the BLM to construct, operate and maintain a switching station on public land at the interconnection point between the proposed transmission line and the existing electrical transmission system. The proposed switching station would disturb less

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than one acre and would be located within the existing SPPCo easement in Section 13, T33N, R34-1/2E. The structures would be approximately 65 feet above ground.

The proposed transmission line structures would be the "H-frame" design common throughout northern Nevada (see Appendix C, Figure 9). Each structure would consist of two wooden poles, each approximately 65-80 feet in height, placed approximately 25 feet apart and cross-braced to maintain form. A 29-foot long cross bar would support the transmission line insulators and conductors. The average spacing between structures would be between 300 to 660 feet, depending on terrain. The proposed transmission line would be designed to meet all temperature, wind, voltage, span and structure height clearance requirements. The proposed transmission line would also provide raptor protection in compliance with the standards described in the "Suggested Practices for Raptor Protection on Power Lines, The State of the Art in 2006."

Pulling stations, required for installing the conductors, would be located within the ROW approximately every two to three miles. Pulling of the conductors would be accomplished completely within the ROW by trucks capable of off-road travel. Grading or clearing of the surface would occur only when absolutely necessary for the safe access or for installing the conductors and would only occur within the proposed ROW. These pulling stations would each be used for only short periods of time during the final construction process and would be reclaimed as necessary upon project completion.

NGP does not propose to construct any new transmission line access roads. Existing roads would be utilized whenever possible to access the ROW. In those areas where no reasonable access roads exist, NGP would utilize overland travel to access the ROW. NGP would also utilize overland travel within the ROW to access the structure locations and pulling stations for construction of the transmission line. Blading or grading would occur only when absolutely necessary for the safe access or installation of structures and would only occur within the proposed ROW.

Transmission line poles, with the below ground portions treated with pentachlorophenol, would be transported to the staging areas via commercial trucks. Approximately 25 semi-truck-trailer loads would be required to bring the materials to the staging areas. Once at the staging areas, the poles would be transported to individual installation sites via flat bed trucks designed for overland travel. A standard truck-mounted auger and backhoe would be used to drill the holes for pole installation. The poles would be lifted by crane and installed with the assistance of a boom truck. The construction of each tower would result in the temporary disturbance (crushed vegetation, etc.) of approximately 2,500 square feet (0.057 acres).

Transmission line construction would be conducted by approximately 20 to 25 people and is expected to take approximately 9 months. Trash and construction debris would be hauled offsite by a licensed contractor.

Maintenance would include transmission line and pole repair and/or replacement. No routine maintenance would be performed on the transmission line. However, NGP would annually inspect the transmission line from a light, off-road vehicle. NGP would make repairs and/or facility replacement, as necessary. NGP would not routinely travel within the ROW and maintenance would not include the construction of new access roads.

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2.1.2 Operations Plan

Two exploration wells were analyzed under EA #NV-020-02-06 in 2001. Seven additional exploration well locations were analyzed under EA #NV-020-06-EA-06 in 2006 and are currently approved (see section 1.1). NGP is proposing to convert four of the wells to production wells via sundry notice. The four wells to be converted are: 23-14, 26A-14, 38-14, and 66-14 (see Appendix C, Figure 2).

NGP is proposing to drill and test nine new geothermal wells, each located within federal geothermal lease NVN-58196 in Section 14 (T36N, R34E, MDB&M). These wells are identified in Table 1 and shown on Appendix C, Figure 4. The well locations identified in Table 1 are tentative and may need to be moved as a result of geologic, geophysical and geothermal reservoir information obtained as these and other wells are drilled. Geothermal Drilling Permit (GDPs) applications and/or a sundry notice would be submitted for approval prior to construction of the well pads or commencing the drilling of a well.

Table 1: Proposed Federal Geothermal Wells

Well Name (Modified Kettleman No.)	Township/ Range	Legal Description (Section Number & Allquot Part)	Approximate UTM Coordinates (NAD27) ¹	
			Easting (m)	Northing (m)
21-14	T36N, R34E	NW1/4NW1/4, Section 14	404400	4539350
42-14	T36N, R34E	NE1/4NW1/4, Section 14	404800	4539175
26-14	T36N, R34E	NW1/4SW1/4, Section 14	404540	4538370
28-14	T36N, R34E	SW1/4SW1/4, Section 14	404470	4538000
15-14	T36N, R34E	NW1/4SW1/4, Section 14	404250	4538500
17-14	T36N, R34E	SW1/4SW1/4, Section 14	404275	4538175
45-14	T36N, R34E	NE1/4SW1/4, Section 14	404875	4538575
47-14	T36N, R34E	SE1/4SW1/4, Section 14	404925	4538250
14-14	T36N, R34E	SW1/4NW1/4, Section 14	404200	4538825

¹ All UTM coordinates are rounded to the nearest 25 meters.

Each new well would require the construction of an approximately 2.1-acre (300-foot by 300-foot) level well pad to accommodate the drilling rig, drilling reserve pit, and support equipment and vehicles necessary during drilling (see Appendix C, Figure 7). Actual dimensions of the well pad would be modified as appropriate to best match the physical and environmental characteristics of the specific site and minimize grading (cut and fill). Construction of all nine proposed well pads would result in a total of about 18.6 acres of new surface disturbance, all of which would be located on public lands.

Storm water runoff from undisturbed areas around the constructed well site would be directed into ditches around the site and back onto undisturbed ground consistent with best management practices for storm water.

Reserve pits would be constructed in accordance with the applicable best management practices identified in the Gold Book. These reserve pit(s) would be fenced with an enclosure fence on three sides and then fenced on the fourth side once drilling has been completed to prevent access by persons, wildlife or livestock (see Figure 11). The fence should remain in place until pit(s) reclamation begins.

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These reserve pits would be constructed on each pad for the containment and temporary storage of geothermal fluid, drill cuttings and waste drilling mud during drilling operations. Each reserve pit would be approximately 250 feet by 75 feet by 25 feet deep. They would each hold roughly 3 million gallons, with a 3-foot freeboard, in order to temporarily store the geothermal fluid produced by each well during drilling under artesian conditions and produced by the well during the initial flow testing.

Geothermal Well Drilling and Testing

Each geothermal well would be drilled with a large rotary drill rig. During drilling, the top of the drill rig derrick may be as much as 175 feet above the ground surface, and the rig floor would be at least 20 feet above the ground surface. During drilling operations, flags are flown from the top of the drill rig. The typical drill rig and associated support equipment (rig floor and stands; draw works; derrick; drill pipe; trailers; mud, fuel and water tanks; diesel engines and generators; air compressors; etc.) would be brought to the prepared well site on 20 or more large tractor-trailer trucks. Additional equipment and supplies would be brought to the site during ongoing drilling and testing operations. Ten or more tractor-trailer truck trips may be generated on the busiest day of drilling operations, although on average about two to three large tractor-trailer trucks (delivering drilling supplies and equipment), and about 16 to 20 smaller trucks/service vehicles/worker vehicles (including the water trucks), would be driven to the site each day throughout the typical 45-day drilling process. Difficulties encountered during the drilling process, including the need to re-drill the hole, could increase the time required to successfully complete each geothermal well. Drilling would be conducted 24-hours per day, 7-days per week by a crew of four to six workers. During short periods, the number of workers on site during drilling may be as high as 12.

The drilling supervisor, drilling rig manager (tool pusher), drilling mud engineer, lease manager, well site geologist, and NGP company representative would typically sleep onsite during drilling. As needed, a directional driller would also sleep on location. Each would be housed in individual recreational vehicle trailers located in the corner of the drill pad.

Each well would be drilled and completed to a nominal measured depth of 6,000 feet (see Appendix C, Figure 8). The geothermal well drilling program involves a sequence of drilling a hole to a selected depth, cementing a steel casing of smaller diameter into the drilled hole, then repeating the process with progressively smaller holes and cemented casings to progressively greater depths until the design depth (or the depth selected in the field by the project geologist) is reached. The steel casing is designed to prevent mechanical failure of the drilled hole, prevent contamination of the ground water by the geothermal fluid, and prevent loss of the geothermal resource into other aquifers. After cementing of the initial ("surface") casing in the well, blowout prevention equipment (BOPE), which is typically inspected and approved by the BLM and/or the Division of Minerals of the Nevada Commission on Mineral Resources (NDOM), as applicable, would be installed, tested and ready for use while drilling to ensure that any geothermal fluid encountered does not flow uncontrolled to the surface.

Each well would be drilled to a depth of approximately 3,000 feet using non-toxic, temperature-stable drilling mud composed of a bentonite clay-water or polymer-water mix to lubricate and cool the drill bit, bring the rock cuttings to the surface for discharge into the reserve pit, and prevent loss of drilling fluids into the rock. Additional non-hazardous and non-toxic additives would be added to the drilling mud as needed to prevent corrosion, increase mud weight, and prevent mud loss. Additional drilling mud would be mixed and added to the drilling rig's mud system as needed to maintain the required quantities.

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Below approximately 3,000 feet each well may be drilled using water with a soap/foam additive and compressed air to reduce the weight of the drilling fluids in the hole, maintain the reservoir permeability and carry the cuttings to the surface. The air, water, rock cuttings, and any reservoir fluids brought to the surface would be diverted through a separator/muffler to separate and discharge the air and water vapor to the atmosphere and the drilling mud and cuttings to the reserve pit.

Each well may need to be re-drilled if mechanical or other problems are encountered while drilling or setting casing which prevent proper completion of the well in the target geothermal reservoir. Depending on the circumstances encountered, re-drilling may consist of re-entering and re-drilling the existing well bore; re-entering the existing well bore and drilling a new well bore; or sliding the rig over to a new location on the same well pad and drilling a conductor and new well bore.

Upon reaching a desired measured depth, with the drill rig still over the well bore, the residual drilling mud and cuttings would be flowed from the well bore and discharged to the reserve pit. The well would be evaluated using wireline pressure, temperature and spinner logs. This may be followed by one or more short-term flow tests, each lasting a few hours and also conducted while the drill rig is over the well. Each short-term flow test would consist of allowing the geothermal well to flow into the reserve pit while monitoring geothermal fluid temperatures, pressures, flow rates, chemistry and other parameters. An injectivity test may also be conducted by injecting the produced geothermal fluid from the reserve pit back into the well and the geothermal reservoir. The drill rig would likely be moved from the well site following completion of these short-term test(s).

One or more long-term flow tests of each geothermal well may also be conducted following short-term flow testing to more accurately determine long-term well and geothermal reservoir productivity. Long-term flow testing would be conducted by either pumping the geothermal fluids from the well using a line shaft turbine pump or electric submersible pump, or allowing the well to flow naturally to the surface. The produced geothermal fluids would be directed through onsite test equipment. Geothermal steam and non-condensable gases, separated from the produced geothermal fluid, would be discharged into the atmosphere. The onsite test equipment would include standard pressure and temperature transducers, recording, and sampling apparatus.

The geothermal fluid produced during each long-term flow test would be discharged into the on-site reserve pit. Using a surface booster pump, the fluids would subsequently be moved through a temporary pipeline to one or more of the other new geothermal wells or currently approved geothermal wells already drilled. There it would be injected back into the geothermal reservoir. The temporary pipeline would either be laid on the surface on the disturbed shoulders of the access roads connecting the geothermal wells, or laid "cross-country." As required, access roads would be crossed by trenching and burying the temporary pipe in the trench. Alternately, the geothermal fluid would be moved to the larger reserve pit located adjacent to well 26A-14 to be stored for future use as drilling fluid mix water.

If a well does not exhibit the anticipated productivity or injectivity, or the geothermal reservoir does not exhibit the anticipated permeability, it may be necessary to conduct "work over" operations on the well. Well work over operations consist of a wide range of potential measures, such as air or gas lift operations, formation stimulation (using a dilute mixture of hydrochloric (muriatic) and hydrofluoric acids or rock fracturing techniques), multiple well completions, and

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well deepening or re-drilling. Subsequent to any well work over, the well would likely be flow tested again as described above.

2.1.3 Utilization Plan

Geothermal Wells

The number of geothermal wells required for the Project is principally dependent on the productivity or injectivity of the wells and the temperature and pressure of the produced geothermal fluid.

Based upon the geothermal resource data collected to date, NGP expects that six geothermal production wells would be needed to produce the geothermal fluid required to support the Project. However, the productivity of the completed wells, or the temperature and pressure of the produced geothermal fluid could be substantially lower than demonstrated by the drilling and testing conducted to date. To ensure that sufficient wells are available to complete the project, NGP is proposing thirteen production wells (nine new wells) on public land. These new production wells are identified in Table 1 (see Appendix C, Figure 4). (Additional well flow testing may indicate that one or more of these proposed production wells may be better used for the injection of geothermal fluid.)

Geothermal injection wells would also be needed to inject the geothermal required to support the project. The injection wells would be located on private land (see section 2.1.4).

Each of the production wells would either flow naturally to the surface, producing a mixture of liquid and steam, or be equipped with a pump to bring the geothermal fluid to the surface under pressure without flashing any of the geothermal fluid to steam. The electricity to power the well pump motors would be supplied via an electric conductor installed from the power plant along the connecting pipelines (see additional discussion below under "Geothermal Pipelines"). Wellhead dimensions for the pumped wells are not expected to exceed a height of fifteen feet above the ground surface or four feet in diameter. Wellhead dimensions for the wells not pumped (and the injection wells) would be much smaller. An approximately 8-foot by 15-foot by 10-foot high motor control building may be located within approximately 50 feet of each pumped well to house and protect the auxiliary well control systems; motor switch gear controls and sensors; transmitters for key temperature, pressure, and flow rate data; and geothermal fluid treatment systems. The well control systems, data transmitters and geothermal fluid treatment systems used for the wells which are not pumped (both production and injection) would typically be placed inside a smaller structure.

During normal well field operations, total geothermal fluid production rates would be expected to be approximately 12,000 gallons per minute (gpm) (19,400 acre-feet per year) at 320°F, for either a binary or flash type power plant. Individual production well flow rates are expected to be approximately 2,000 gpm (3,226 acre-feet per year) with a wellhead pressure of about 60 pounds per square inch gauge (psig). Based on analyses to date, the produced geothermal fluid would be a neutral alkali-chloride type water typical of high temperature geothermal systems in the Great Basin. It would be rich in sodium (Na), potassium (K) and chloride (Cl), but relatively poor in calcium (Ca), magnesium (Mg) and bicarbonate (HCO₃). The calculated total dissolved solids concentration would be about 3,600 parts per million (ppm).

The production of hot geothermal fluid from each well would be flow rate controlled. Pressure limit sensors would automatically shut down each well pump in the event of an excessively high discharge pressure, which could damage the pump. The well flow and any well head pumps

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would also be monitored by the power plant's computer control systems which would shut in the wells and shut down the pumps in the event of a mismatch in the geothermal fluid flow measured to and from the power plant (which could result from, for example, a leak in the pipeline).

Flow, temperature and pressure would be continuously monitored. Well integrity would be tested every five years.

Geothermal Fluid Pipelines

Geothermal fluid production pipelines bring the geothermal fluid from the production wells to the power plant. If the Project needs only the anticipated six production wells, total surface disturbance for the production pipeline would be 2.34 acres, all on federal land. If the Project requires all of the proposed 13 production wells, total surface disturbance for the production pipelines would be 3.32 acres, all on federal land.

Geothermal fluid injection pipelines deliver the cooled geothermal fluid from the power plant to the injection wells. Total surface disturbance for the public land portions of the injection pipeline would be between 1.72 acres and 1.95 acres. A discussion of the private land portions of the injection pipeline (and the injection wells) can be found in section 2.1.4

These public land production and injection pipeline routes generally follow the shortest distance from each well pad to the next well pad or the power plant in order to minimize the amount of pipe required, reduce heat losses and the energy required to move the fluids, and minimize the amount of ground disturbance. In addition, the proposed pipeline routes generally follow existing or proposed roads to facilitate ongoing monitoring and future maintenance. However, the final alignment of the pipeline routes would be dictated by the specific wells completed for the project and the need to match fluid characteristics and balance fluid volumes in these pipelines.

The geothermal liquid pipelines would be constructed from seamless, welded-steel pipe, and are expected to range in diameter from 8 inches to 24 inches. If any of the wells are naturally produced, the geothermal steam and liquid produced in the well would either be conveyed to the power plant together in a single, larger diameter pipeline (up to 48 inches) or separated into steam and liquid at the well site and conveyed to the power plant in separate, parallel pipelines. Two to three inches of insulation and a protective aluminum sheath (appropriately colored to blend with the area) would jacket the steel production pipes, increasing the diameter of the finished production pipelines by up to 6 inches.

Horizontal expansion loops (a square bend in the pipeline approximately 30 feet in length by 30 feet in width) would be constructed about every 250 to 350 feet along the production pipelines in order to allow the pipeline to flex as it lengthens and shortens due to heating and cooling. Expansion loops along the injection pipelines would be less frequent, as they are subject to less heating and cooling. The pipelines would be constructed near ground level (averaging about one foot of ground clearance) on steel supports called "sleepers" constructed approximately every 30 feet, which support the pipeline. Electrical power and instrumentation cables for the well pump motors (if used), valves and instrumentation would either be installed in a steel conduit constructed along the same pipe sleepers or buried in a trench dug along the pipeline routes.

Pipeline construction would begin by vertically auguring nominal 24-inch diameter holes into the ground about eight to ten feet deep at approximately 30-foot intervals along the pipeline route (twin holes for two supports may be drilled at the pipeline anchor points, which would be located

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at the center of each expansion loop and in between each expansion loop). Dirt removed from the holes would be cast on the ground adjacent to each hole. The steel pipe "sleeper" would be placed in the hole and concrete poured to fill the hole slightly above the ground surface. The steel pipe sleeper would extend above the concrete, averaging approximately one foot above ground surface.

While the concrete is curing, the approximately 30-foot long steel pipe sections would be delivered and placed along the construction corridor. A small crane would lift the pipe sections onto the pipe supports and temporary pipe jacks so that they could be welded together into a solid pipeline. Once welded and the welds tested, the pipe would be jacketed with insulation and an aluminum sheath (appropriately colored to blend with the area). When completed, the top of the new pipelines would average less than three feet above the ground surface. Electrical power and instrumentation cables for the wells would then either be installed in steel conduit constructed along the same pipe sleepers or buried in a trench dug along the pipeline route. If the trenching option for the power and control cables is selected, an approximately 12-inch wide trench would be excavated to an average depth of approximately three feet deep alongside the pipeline sleepers.

Pipeline road crossings would be constructed to allow continued vehicle access. This would typically use the cut-and-fill method, where a trench would be cut through the road, a prefabricated, "U"-shaped, oversized pipe sleeve (containing the fabricated geothermal fluid pipeline with the insulation and metal cladding in place) installed in the trench, the excavated dirt backfilled and compacted around and above the oversize pipe sleeve, and the roadbed material repaired or replaced. Alternatively, the pipelines could be constructed across the roads on sleepers (as described above) and the roadbed run up and over the pipeline. This would entail constructing a steel or concrete conduit over a pipeline where it crosses a road, then compacting dirt on either side of the conduit sufficient to ramp the roadbed up and over the conduit to allow traffic to travel over the pipeline.

2.1.4 Actions Proposed on Private Lands

Transmission Line Corridor Activities

The two transmission line angle points, both located on private land, and the two small directional changes in Section 20, T34N, R35E where the proposed transmission line "jogs" to the west and then continues due south, would require small additional areas to encompass the guy anchors.

NGP proposes to construct, operate and maintain a substation within the boundaries of the proposed power plant on private land in Section 23, T36N, R34E.

Three approximately 300 foot by 300 foot staging areas would be located on private land along the ROW corridor to temporarily store materials required for construction (see Table 2 and Figure 1).

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Table 2: Staging Area Locations

Staging Areas	Township/ Range	Legal Description (Section Number & Aliquot Part)	Land Status
Staging Area #1	T34N, R35E	Portion NE1/4 and SE1/4 Section 31	Private
Staging Area #2	T35N, R35E	Portion SW1/4 Section 17	Private
Staging Area #3	T36N, R34E	Portion NW1/4 Section 23	Private

Injection Wells

Seven injection wells would be required to inject the geothermal fluid produced from the up to thirteen production wells. All injection wells are proposed to be located on private lands. Appendix C, Figure 4 shows the proposed locations of these injection wells, and Table 3 lists the name, legal description and approximate location of each of these seven injection wells. The well locations identified in Table 3 are tentative and may need to be adjusted as additional geologic, geophysical and geothermal reservoir information is obtained as new wells are drilled and tested. (Additional well flow testing may indicate that one or more of the proposed production wells located on public land may be better used for the injection of geothermal fluid.)

Table 3: Proposed Private Land Injection Wells

Well Name (Modified Kettleman No.)	Township/ Range	Legal Description (Section Number & Aliquot Part)	Approximate UTM Coordinates (NAD27) ¹	
			Easting (m)	Northing (m)
13-11	T36N, R34E	SW1/4NW1/4, Section 11	404200	4540575
63-11	T36N, R34E	SW1/4NE1/4, Section 11	405350	4540575
36-11	T36N, R34E	NE1/4SW1/4, Section 11	404700	4539900
81-15	T36N, R34E	NE1/4NE1/4, Section 15	404100	4539325
85-15	T36N, R34E	NE1/4SE1/4, Section 15	403925	4538575
86-15	T36N, R34E	SE1/4SE1/4, Section 15	403975	4538275
88-15	T36N, R34E	SE1/4SE1/4, Section 15	404000	4537900

¹All UTM coordinates are rounded to the nearest 25 meters.

Please see sections 2.1.2 and 2.1.3 for a discussion of well drilling, testing, and utilization activities.

Geothermal fluid injection rates for either a binary or a flash power plant would range from 100% to 85% of the geothermal fluid production rates (16,500 to 19,400 acre-feet per year), depending on whether and how much of any steam condensate was being consumed as cooling tower make up water. Individual injection wells are expected to receive between 3,400 and 4,000 gpm (5,500 to 6,500 acre-feet per year) of 225°F geothermal fluid with wellhead injection pressures of about 75 psig.

Injection Pipeline

If the Project needs only three injection wells, surface disturbance for the private land portions of injection pipeline would be 1.79 acres. If the Project requires all of the proposed 7 injection wells, surface disturbance for the private land portions of the injection pipelines would be 2.60 acres.

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Please see section 2.1.3 for a discussion of pipeline construction and utilization activities.

Power Plant

NGP is proposing to construct, operate, maintain and eventually decommission a 37.5 MW (gross rated) geothermal power plant located on an approximately 14-acre site entirely on private land in the NW1/4NW1/4 of Section 23, T36N, R34E, MDB&M. Because the geothermal resource is not yet completely defined, the NGP power plant would utilize either a flash (steam) design or a binary (heat exchanger) design, or a combination of both designs.

Binary cycle power plants can use either high or moderate temperature geothermal resources. Geothermal fluids for a binary power plant may be produced from the production wells either by natural flow (high temperature) or by pumping (moderate temperature). Flash power plants typically use higher temperature geothermal resources. The geothermal fluid for a flash power plant is often naturally produced (without pumping) from the production wells.

Installed equipment and site appearance for a flash power plant would be similar to a binary power plant except that the separator vessels (geothermal fluid to steam and geothermal liquid) would be added and the binary working fluid storage tanks would be removed.

In a flash steam plant, the non-condensable gases (principally carbon dioxide, with some small amounts of nitrogen, methane, ammonia and hydrogen sulfide) contained in the geothermal fluid are transferred to the geothermal steam, and would be removed from the steam condenser system and exhausted to the atmosphere through an exhaust stack and the cooling tower. Emissions would be regulated and monitored under a Class II (non-major) permit issued by the Nevada Department of Environmental Protection, Bureau of Air Pollution Control (NDEP-BAPC).

If a binary plant were constructed, there would be no non-condensable gas emissions. However, some of the binary working fluid would be released to the atmosphere from rotating seals and flanges and from the process to purge the buildup of air leaking into the binary turbine condenser. These binary working fluid emissions would also be regulated and monitored under a Class II (non-major) permit issued by the NDEP-BAPC.

Temporary Water Wells

NGP intends to drill a temporary, fresh water well in Section 15, T36N, R34E (see Appendix C, Figure 2). This well is permitted for temporary use by the Division of Water Resources, waiver #OG-235. Drilling the water well will disturb an area of approximately 150 feet by 150 feet (approximately 0.50 acre). A small reserve pit will be constructed in order to contain drill cuttings and pump test water. The reserve pit would measure approximately 50 feet by 15 feet by 10 feet. Upon completion of the well, this reserve pit may be kept as a containment pit for the purpose of holding fresh water.

2.1.5 Site Access and Road Construction Activities

Access to the proposed power plant and well field area would begin at Jungo Road, an existing improved gravel road (see Appendix C, Figure 2), at approximately the SW1/4NW1/4 of Section 36, T36N, R34E, which is the last point of legal access. An existing north-south dirt road starting at the SW1/4NE1/4 of Section 35, T36N, R34E, off of Jungo Road provides primary access ("Primary Access Road") to the geothermal operations area (see Appendix C, Figure 2).

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Access to the southern portion of the transmission line corridor would originate in the SW1/4NE1/4 of Section 5, T32N, R35E off of Interstate 80. Access from the northern end of the transmission line corridor would be off of Jungo Road in Gaskell at the NW1/4SE1/4 of Section 34 T36N, R34E and at Pronto in the NE1/4NE1/4 of Section 5, T35N, R35E (see Figure 1).

The geothermal operations require the construction of approximately 6.05 miles of new road. Approximately 4.25 miles would be on public lands and 1.80 miles would be on private lands. Assuming that the surface disturbance associated with each road would be 20 feet, a total of up to 14.70 acres of new surface disturbance could occur with this new access road construction. About 10.30 acres of this new surface disturbance would be on public lands, and about 4.40 acres would be on private lands.

The existing access roads for geothermal operations and transmission line construction would be maintained to safely accommodate anticipated traffic during construction and drilling. This includes an all-weather surface with a road bed width of 16 feet, a maximum grade of six percent and a turning radius of no less than 50 feet, consistent with the best management practices for road construction applicable to development roads.

All roads used to access the wells would be maintained as needed to safely accommodate the traffic required to drill and test the wells. Roads would be maintained consistent with guidance in the Gold Book. Drainage structures as may be necessary to ensure proper and adequate road drainage (such as drainage dips, ditches, road crowning and culverts) would be installed consistent with guidance in the Gold Book.

2.1.6 Water Required

Water required for well drilling would typically average about 50,000 gallons per day during drilling operations. Water required for site and road grading, construction, and dust control would average less. Construction of the power plant would require approximately 10 acre-feet of water throughout the construction period.

The water necessary for construction activities would be obtained from either the County Well at Mile Post 19 on Jungo Road, located approximately 7 miles east of the proposed geothermal operations or from a County Well on Jungo Road, located approximately 1 mile west of the proposed geothermal operations (see Appendix C, Figure 2). Water obtained from either well would be delivered via a water truck capable of carrying approximately 4,000 gallons per load.

Water for drilling may be obtained from one or more temporary water wells drilled on private land in the SE1/4NW1/4 of Section 1, or in the SW1/4SE1/4 of Section 15, T36N, R34E, MDB&M. Along with the temporary water wells in Sections 1 and 15, additional temporary fresh water wells for drilling activity may be drilled on existing thermal gradient well sites or any of the seven proposed injection well sites may be converted temporarily to fresh water wells. Makeup water for drilling may also be obtained from the geothermal wells providing that the geothermal fluid is environmentally acceptable. Water from these wells would be delivered via a temporary pipeline laid adjacent to the access road(s) (see Appendix C, Figure 2).

During operation of the power plant, up to approximately 2,200 acre-feet of water would be consumed by evaporation per year (approximately 6.02 acre-feet per day) for the facility cooling tower operation. This water would either be obtained from the geothermal steam condensate (if some of the geothermal fluid from the production well is flashed to steam), or be pumped from

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one or more of four groundwater wells proposed on private land in the SE1/4NW1/4 of Section 1, T36N, R34E, MDB&M (see Appendix C, Figure 2). The water from these wells would be delivered to the power plant via a PVC pipeline buried adjacent to the "Primary Access Road."

2.1.7 Aggregate Material Required

To the extent practicable, native materials (derived from grading to balance cut and fill) would be used for site and road building materials. Approximately 25,000 yards of surfacing material may be needed for the surfacing of the drill pads and access roads, as appropriate. Each drill pad would be covered with up to 6 inches of gravel. Total aggregate required is estimated at about 1,200 cubic yards per pad.

Drill pad and road building material would be obtained from county and private pits in the local area, or from a deposit recently identified approximately 100 feet north of the DB-2 (37-14) well in the SW1/4NE1/4 of Section 14, T36N, R34E (see Appendix C, Figure 2).

2.1.8 Work Force and Schedule

Drilling would be conducted by a crew of four to six workers with as many as twelve workers on site during short periods. Power plant and pipeline construction would likely require a maximum of up to 135 workers. Transmission line construction would be conducted by approximately 20 to 25 workers. Once operating, the Project would have approximately 15 employees.

Construction of the power plant and well field facilities would require 18 to 22 months once all permits are obtained and equipment orders scheduled. Transmission line construction is expected to take approximately 9 months. Commercial operations are anticipated to commence in the third quarter of 2009 and would continue until 2039.

2.1.9 Project Decommissioning and Site Reclamation

The estimated life of the Project is 30 years or its useful life, whichever is longer. At the end of Project operations the wells would be plugged and abandoned as required by BLM regulations. All above-ground equipment, including the power plant and ancillary facilities and the pipelines and their supports, would be removed. NGP would prepare a site reclamation plan for BLM approval prior to plan implementation. The plan would address restoring the surface grades, surface drainage and revegetation of cleared areas.

Poles, conductors, and hardware associated with the 120 kV transmission line would be removed. The remaining holes would be filled with soil gathered from the immediate vicinity. The areas where the poles were removed would be raked to match the surrounding topography. Bladed areas would be recontoured and seeded with the appropriate seed mix.

2.1.10 Environmental Protection Measures

NGP will comply with the special lease stipulations attached to federal geothermal leases N-77668, N-80086, and N-80159 (see Appendix A). As lease NVN-58196 does not have any associated special lease stipulations, NGP will comply with all special lease stipulations attached to leases N-77668, N-80086, and N-80159 which are applicable to project operations.

The "General Terms and Conditions" to be included in the transmission line and switching station ROW Grants do not include project specific terms and conditions being developed as

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part of the NEPA process. Project specific terms and conditions will be added to the "General Terms and Conditions" included in Appendix D.

In addition, the following environmental protection measures were adopted by NGP for project operations:

- Water would be applied to the ground during the construction and utilization of the drill pads, access roads, and other disturbed areas as necessary to control dust.
- Portable chemical sanitary facilities would be available and used by all personnel during periods of well drilling and/or flow testing, and construction. These facilities would be maintained by a local contractor.
- To prevent the spread of invasive, nonnative species, vehicles and equipment would be power washed, including body and undercarriage, prior to entering public lands managed by the BLM.
- Prior to drilling any new temporary water wells, all necessary permits will be obtained from the State Water Engineer at the Division of Water Resources and forwarded to the BLM Winnemucca Field Office.

Prevent or Control Fires

- All construction and operating equipment would be equipped with applicable exhaust spark arresters. Fire extinguishers would be available on the active sites. Water that is used for construction and dust control would be available for fire fighting. Personnel would be allowed to smoke only in designated areas, and they would be required to follow applicable BLM regulations regarding smoking.

Prevent Soil Erosion

- Cut and fill activities have been minimized through the selection of the power plant site and pipeline routes. Off-site storm water would be intercepted in ditches and channeled to energy dissipaters as necessary to minimize erosion around the power plant. To minimize erosion from storm water runoff, access roads would be maintained consistent with the best management practices for road construction applicable to development roads. BLM best management practices for storm water would be followed, as applicable, on public lands.

Protect Surface or Ground Water

- Geothermal fluids would not be discharged to the ground under normal operating conditions. Accidental discharges of geothermal fluids are unlikely because of frequent inspections, ultrasonic testing of the pipeline, flow and pressure monitoring and well pump and pipeline valve shutdown features.

Protect Wildlife

- Following project construction, areas of disturbed land no longer required for operations would be reclaimed to promote the reestablishment of native plant and wildlife habitat.

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Protect Cultural, Visual and Other Natural Resources

- Any areas containing cultural resources of significance would be avoided, or the potential for impacts mitigated in a manner acceptable to the BLM Archaeologist. NGP employees, contractors, and suppliers would be reminded that all cultural resources are protected and if uncovered shall be left in place and reported to the NGP representative and/or their supervisor.
- The power plant, pipelines, wellheads, pump motors and motor control buildings would each be painted an appropriate color to blend with the area and minimize visibility. The fence constructed around each of the production well sites and the power plant site would also be painted an appropriate color to blend with the area.

Minimize Air and Noise Pollution

- NGP would comply with any requirements prescribed by the NDEP-BAPC. NGP also proposes to water the ground to control dust during construction.
- Construction noise would be minimized through practices which avoid or minimize actions which may typically generate greater noise levels, or generate distinctive impact noise.

Minimize Hazards to Public Health and Safety During Normal Operations

- Construction and operation activities would be conducted in a manner to avoid creating any hazards to public health and safety. The project is remotely located and would not likely cause hazards to public health and safety.

2.2 Alternatives to the Proposed Action

NEPA requires that a reasonable range of alternatives to the proposed action be considered that could feasibly meet the objectives of the proposed action as defined in the purpose and need for the project [40 CFR 1502.14(a)]. The range of alternatives required is governed by a "rule of reason" (i.e., only those feasible alternatives necessary to permit a reasoned choice need be considered). Reasonable alternatives are those that are practical or feasible based on technical and economic considerations [46 Federal Register 18026 (March 23, 1981), as amended; 51 Federal Register 15618 (April 25, 1986)].

Alternatives to the proposed action must be considered and assessed whenever there are unresolved conflicts involving alternative uses of available resources [BLM NEPA Handbook H-1790-1, page IV-3 (BLM 1988)].

No unresolved conflicts regarding the proposed action within the power plant and wellfield area have been identified to drive the creation of any alternatives which would still meet NGP's purpose for the project: to commercially develop the geothermal resources and to construct and operate a commercial geothermal power plant and wellfield. Therefore, no alternatives for activities within this area (other than the required "No Action Alternative") are analyzed in this Environmental Assessment.

A concern was raised during Project scoping (see Section 1.6) that the proposed transmission line corridor would cross the Idaho Stage Road (Road) and California Emigrant Trail (Trail) at locations of high cultural sensitivity. The Trail has been designated by Congress as a National

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Historic Trail, and both the Road and the Trail have been determined eligible for inclusion in the National Register of Historic Places (see Section 3.3). Alternative 1 was identified as an alternative which could lessen the adverse impact of the proposed action to the setting and integrity of the Road and the Trail.

2.2.1 Alternative 1

Alternative 1 differs from the proposed action only in the location of the southern half of the transmission line corridor and the switching station. The new Alternative 1 transmission line corridor alignment parallels the existing mine access road, pipeline and power line route from the Nevada-Massachusetts Tungsten Mine to the mine groundwater well and water tank. In doing so it crosses the Road and the Trail at the same locations where these existing mine facilities also cross Road and Trail. The segments of the Road and Trail crossed by these facilities are considered non-contributing elements to the eligibility of the Road and Trail for inclusion in the National Register of Historic Places.

The geothermal facilities and operations of the proposed action and Alternative 1 are identical. The Alternative 1 transmission line alignment is also identical to the proposed action transmission alignment from the power plant substation to the northwest corner of Section 17, T34N, R35E. As shown in Figure 1, the Alternative 1 alignment then diverges from the proposed action alignment by turning 45 degrees (southwest), running diagonally across Section 18, T34N, R35E, to the northwest corner of Section 19, T34N, R34E. There it makes a 45 degree turn to the south and runs south along the western edge of Sections 19, 30 and the north half of Section 31, T34N, R35E. There it makes a 90 degree turn east, crossing through the center of Section 31, T34N, R35E, parallel to the existing access road, pipeline and power line route to the Tungsten Mine groundwater well and water tank. At the eastern edge of Section 31 it would turn 90 degrees and run south along the eastern edge of the south half of Section 31, T34N, R35E; all of Section 6, T33N, R35E; and all of Sections 1, 12, and 13, T33N, R34-1/2E. It would terminate at the SPPCo switching station, which would be relocated to the west of the proposed action location into Section 13, T33N, R34-1/2E.

The Alternative 1 alignment would be approximately 1.40 miles longer than the proposed action alignment, reducing the length of the transmission line on private land by about 0.47 miles but increasing the length of the transmission line on public lands by about 1.88 miles. The Alternative 1 alignment also includes four more transmission line turning points than the proposed action alignment.

2.2.2 Alternatives Considered but Eliminated from Detailed Consideration

Additional alternatives were considered to avoid the transmission line crossing highly rated segments of the Trail and/or Road but were eliminated from detailed consideration for the reasons discussed below.

Alternative 1A is a transmission line alignment which crosses segments of the Trail and the Road which, although considered contributing elements to the eligibility of the Trail and Road for inclusion in the National Register of Historic Places, are not as highly rated as the segments crossed by the proposed action. However, the Alternative 1A transmission line alignment crossing of the Trail and Road would have a direct adverse effect to the integrity of setting, and indirect effects to the integrity of feeling and association.

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Potential Alternatives 2, 3 and 3A transmission line alignments were each developed to have the transmission line alignment cross the Trail at a common location very close to where the existing underground natural gas pipeline and accompanying access road cross the Trail. These alternatives were eliminated from detailed consideration in this EA because this segment of the trail was still highly rated, and crossing the Trail at this location of high cultural sensitivity would not lessen the adverse impact from the proposed action to the setting and integrity of the Trail.

Potential Alternative 4 transmission line alignment is identical to Alternative 1A where it crosses the Trail and Road. However, the north-south alignment of the Alternative 4 transmission line is located an additional one-half mile further west than Alternative 1A, closer to the Eugene Mountains, where visual and raptor issues were more of a concern. Because Alternative 4 would not lessen the adverse impact from Alternative 1A to the setting and integrity of the Trail, this alternative was eliminated from detailed consideration in this EA.

Potential Alternative 5 transmission line alignment would cross the Trail and Road on the historic tailings from the Nevada-Massachusetts Tungsten Mine, which post-date and cover the Trail and Road segments. The north-south alignment of the Alternative 5 transmission line is located an additional one-half mile further west than Alternative 4. This alternative was eliminated from detailed consideration in this EA because the mine tailings would themselves be a historic feature, subject to degradation from disturbance, and the north-south alignment of the transmission line was considered to have potentially substantial visual and raptor concerns.

No other reasonable alternatives to the Project which could feasibly meet the purpose and need for the Project and attain most of the basic Project objectives were identified.

2.3 No Action Alternative

Under the No Action Alternative none of the plans or applications filed by NGP and SPPCo would be approved by the BLM. The proposed action would not be implemented as proposed on federal lands, and none of the potential environmental effects of implementing the proposed action would occur.

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Critical Elements

Critical elements of the human environment are subject to requirements specified in statute, regulation, or executive order and must be addressed in any document prepared pursuant to NEPA. The BLM NEPA Handbook (H-1790-1), as updated (BLM 1988), stipulates that if the resource or value is not present or is not affected by the proposed action or project alternatives, this may be documented in the EA as a negative declaration. The proposed action has been analyzed to assess direct, indirect, and cumulative impacts to the critical elements of the human environment and the other important resources listed in Table 4.

Those elements or resources marked as "not present" in Table 4 are not present within or adjacent to the geothermal operations area or along the transmission line corridor. Those elements or resources marked as "present not affected" may be present within or adjacent to the geothermal operations area or transmission line corridor but would not be impacted by the proposed action. Those elements or resources marked as "present affected" may be found within or adjacent to the geothermal operations area and transmission line corridor and may be impacted by the proposed action. Elements or resources discussed further in this EA are identified in the column marked as "reference section," with the appropriate section listed for the affected environment and environmental consequences analysis. Elements or resources which contain information in the "comment" column reflect any negative findings and are not discussed further in this EA.

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Table 4: Critical Elements and Other Resources Affected by the Proposed Action

Critical Elements	Not Present	Present Not Affected	Present Affected	Reference Section	Comments
Air Quality			X	3.2; 4.1; 5.4.1	
Areas of Critical Environmental Concern (ACECs)	X			N/A	The proposed project is not located in or near any ACECs (BLM WFO 2002).
Cultural Resources			X	3.3; 4.2; 5.4.2	
Environmental Justice	X			N/A	There are no environmental justice issues associated with the project (BLM WFO 2002).
Floodplains		X			The proposed project is not located in any FEMA-designated floodplains.
Invasive, Nonnative Species			X	3.4; 4.3; 5.4.3	
Migratory Birds			X	3.5; 4.4 5.4.4	
Native American Religious Concerns		X		3.6; 4.5	
Prime or Unique Farmlands	X			N/A	The proposed project is not located in or near any prime or unique farmlands (BLM WFO 2002).
Threatened and Endangered Species	X			3.7	
Wastes, Hazardous or Solid			X	3.8; 4.6; 5.4.5	
Water Quality (Surface and Ground)			X	3.9; 4.7; 5.4.6	
Wetlands and Riparian Zones		X			There is no riparian habitat within the geothermal operations area or along the transmission line corridor (Covert 2007)
Wild and Scenic Rivers	X			N/A	The proposed project is not located in or near any wild and scenic rivers (BLM WFO 2002).
Wilderness	X			N/A	The proposed project is not in or adjacent to any wilderness area (BLM WFO 2002).

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Other Resources	Not Present	Present Not Affected	Present Affected	Reference Section	Comments
Geology and Minerals			X	3.10; 4.8; 5.4.7	
Soils			X	3.11; 4.9; 5.4.8	
Vegetation			X	3.12; 4.10; 5.4.8	
Wildlife Resources			X	3.13; 4.11; 5.4.4	
Fisheries Resources	X			N/A	The proposed project is not located in or near any fisheries.
Range Resources			X	3.14; 4.12; 5.4.9	
Recreation			X	3.15; 4.13; 5.4.10	
Visual			X	3.16; 4.14; 5.4.11	
Social Values				N/A	No social values would be affected by the project.
Economic Values			X	3.17; 4.15; 5.4.12	
Water Quantity			X	3.9; 4.7; 5.4.6	
Lands and Realty			X	3.18; 4.16	
Candidate and Special Status Species			X	3.19; 4.17; 5.4.4	
Fire Resources			X	3.20; 4.18; 5.4.13	

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3.2 Air Quality

Air quality in the geothermal operations area and along the transmission line corridor has been designated as "attainment/unclassified" (which means it either meets, or is assumed to meet, the applicable federal ambient air quality standards) for all standard ("criteria") air pollutants (U.S. EPA 2007). The Nevada Department of Conservation and Natural Resources (NDCNR), Division of Environmental Protection (NDEP), Bureau of Air Pollution Control (BAPC) has been delegated responsibility by both the federal Environmental Protection Agency (USEPA) and the State of Nevada to regulate air pollution and emissions of air pollutants in this area. The geothermal operations area and transmission line corridor are not located in or adjacent to any mandatory Class I (most restrictive) Federal air quality areas, U.S. Fish and Wildlife Service Class I air quality units, or American Indian Class I air quality lands (BLM WFO 2002).

3.3 Cultural Resources

A Class III, Phase 1 cultural resource survey for the project was completed by Native-X, Inc. Archaeological Services (Native-X 2007). The following discussion of the cultural resource setting of the project area is adapted from the report of that survey (Native-X 2007).

The project area is located in an area of low prehistoric cultural resource sensitivity, given the lack of permanent water, such as springs, and available tool stone. The higher sensitivity areas for prehistoric sites are located along the Humboldt River to the east and in the Eugene Mountains to the west, where there are numerous springs.

The project area is included in the territory of the Northern Paiute. The nearest Paiute band, called *Sawawaktodo tuviwarai*, was centered on Winnemucca. The Northern Paiute were semi-nomadic people who shared a common language and cultural patterns while lacking any formal political integration. Subsistence was based on hunting, gathering, and fishing, depending on the seasonal availability of resources. Settlement patterns consisted of seasonal movements of family groups during most of the year. Larger semi-sedentary settlements, or winter villages, occurred along the Humboldt River.

The California Emigrant Trail followed the routes of early explorers along the Humboldt River to Lassen Meadows (now Rye Patch Reservoir). The California Emigrant Trail followed the Humboldt River across much of Nevada between Utah and California. This route was heavily used during the 1850's with the discovery of Gold in California in 1848. Between the years 1849 to 1853, over 50,000 emigrants per year traveled down the narrow Humboldt River Valley. Usage of this route declined during the 1860's, partially due to the construction of the Central Pacific Railroad between 1863 and 1869.

Mining was common in the vicinity of the project area. To the west of the southern portion of the project area is the Mill City Mining district, located on the east slopes of the Eugene Mountains in Pershing County. Approximately 1.8 miles west of the southern portion of the project area is the Keystone Mine, which was once part of the Central Mining district, organized in 1862. Approximately 0.8 mile west of the southern portion of the project area is the Nevada-Massachusetts Tungsten Mine, also located along the east slopes of the Eugene Mountains in Pershing County. Tungsten deposits were first discovered in the Eugene Mountains in 1914, and mining operations occurred sporadically until the late 20th century. Presently, the mines at Tungsten remain idle. To the east of the northern portion of the project area is the Atlas Mine, located at the base of Blue Mountain, within the Ten Mile Mining district in Humboldt County.

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Many mail, freight and stage routes were developed as freight and stage coach ventures responded to the needs of the mining communities. Among these was the Idaho Stage Road, begun in 1865 for the purpose of transporting supplies, mail and passengers from the Humboldt mines to the newly discovered mines in southwestern Idaho. The Idaho Stage Road lost some of its importance with the completion of the Central Pacific Railroad in 1869.

During the late 1800s and early 1900s, a large-scale cattle ranching industry was in operation in Humboldt County. The most notable ranching operation was that of Miller and Lux, whose operation involved moving large herds of cattle from the Quinn River Crossing and the Soldier Meadows ranch through Desert Valley to its destination in Winnemucca. Miller and Lux invested in improving the local road systems through road construction and waterhole improvements to facilitate better movement of their cattle and to supply their ranches. While no ranches are presently located in the project area, some of the old roads located in the project area may have been constructed by the earlier cattle industry.

The Class III, Phase 1 cultural resource survey completed by Native-X was conducted in three separate areas: a 115-acre area around the proposed project water wells in Section 1, T36N, R34E, MDB&M; a 2,161 acre area covering the central portion of the geothermal operations area in Sections 10, 11, 14, 15, 22 and 23, T36N, R34E; and 1,549 acres along approximately 28 miles of transmission line corridor along the proposed action and Alternative 1 transmission line alignments.

A total of 31 cultural resource sites were recorded during the survey. Of these, one was a previously recorded prehistoric site which was determined eligible for the National Register of Historic Places. All of the rest were historic sites, including numerous roads and trash scatters, a water pipe ditch, a telephone line, the Western Pacific Railroad tracks, the Idaho Stage Road and the California Emigrant Trail. Some segments of one historic road, the water pipe ditch, the Idaho Stage Road and the California Emigrant Trail were considered eligible for the National Register of Historic Places (NRHP) under the National Historic Preservation Act of 1966 (NHPA) eligibility criteria (36 CFR 60.4). The telephone line is considered eligible as a contributing element to the Western Pacific Railroad (WPRR). The transmission line crosses the WPRR along with the associated telephone line. The segment of the WPRR is not considered a contributing element where the transmission line crosses due to a loss of integrity. The telephone line may have sufficient integrity to still be considered a contributing element. All other identified historic cultural resources were considered to be not eligible for the NHRP. Of these eligible historic sites, the proposed action and alternative transmission line alignments would cross the Idaho Stage Road, the California Emigrant Trail, the water pipe ditch and the telephone line.

The California Emigrant Trail is a National Historic Trail designated by Congress in 1992 under the National Trails System Act of 1968 (NTSA). The BLM and NHPA provide for protection of the integrity of setting, feeling, and similar characteristics associated with historic properties. The Oregon California Trail Association (OCTA) has developed a classification system designed to assess the condition of the trails at the time of mapping and establish a basis on which to recommend levels of preservation and use for trails on public lands (OCTA 2002). The five OCTA classification categories are as follows:

Class 1: The trail retains the essence of its original character and shows no evidence of having been either impacted by motor vehicles or altered by modern road improvements. There is visible evidence of the original trail in the form of depressions, ruts, swales, tracks,

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or other scars, including vegetative differences and hand-placed rock alignments along the trail side.

Class 2: The trail retains elements of its original character but shows use by motor vehicles, typically as a two track road overlaying the original wagon trail. There is little or no evidence of having been altered permanently by modern road improvements, such as widening, blading, grading, crowning, or graveling. In forested areas the trail may have been used for logging but still retains elements of its original character.

Class 3: The trail route is accurately located and verified from written, cartographic, artifact, topographical, and/or wagon wheel impact evidence (as rust, grooved, or polished rocks). But due to subsequent weathering, erosion, vegetative succession, or logging, trail traces will be nonexistent or insignificant. What does remain is a verified trail corridor with no intrusive modern development. Typically this includes trails that once passed through forests and meadows, across excessively hard surfaces or bedrock (such as on ridges), over alkali flats and sandy soils, and through ravines or washes.

Class 4: The trail location is verified but elements of its original condition have been permanently altered, primarily by road construction, such as widening, blading, grading, crowning, graveling, or paving. In some cases, the original trail has been permanently altered by underground cables and pipelines.

Class 5: The trail is either so obliterated or unverifiable that its location is known only approximately. In many cases, the trail has been destroyed entirely by development, such as highways, structures, agriculture, or utility corridors. In others, it has been inundated beneath reservoirs. In some, there is not enough historical or topographic evidence by which to locate the trail accurately. Thus, only the approximate route is known.

Using this classification system, OCTA volunteers in June of 2006 completed an initial inventory of the California Emigrant Trail in the region which includes the project transmission line. (At the same time the OCTA volunteers completed an inventory of the Idaho Stage Road, using the same OCTA classification system. Although the Idaho Stage Road is not a National Historic Trail, it can reasonably be inventoried using the same OCTA classification system.)

The Native-X survey also evaluated all the California Emigrant Trail and Idaho Stage Road segments using the OCTA classification for at least 400 meters on either side of the Trail or Road intersection with the proposed action and alternative transmission line alignments. Trail and Road segments were also evaluated as a contributing or non-contributing element for eligibility to the National Register of Historic Places (NRHP) under the NHPA eligibility criteria. Evaluations took into consideration the integrity of setting, design, location, materials, workmanship, feeling, and association.

3.4 Invasive, Nonnative Species

Invasive, nonnative species are noxious weeds, insects and plant diseases - non-native to Nevada - that have come to thrive in a given ecosystem. Invasive, nonnative species spread from infested areas by people, equipment, livestock/wildlife and the wind. Because of their aggressive growth and lack of natural enemies, these species can be highly destructive, competitive with native species, or difficult to control.

The state of Nevada lists 45 invasive, nonnative species that require control (Nevada Administrative Code 555.10, effective 10-31-05). BLM lists eleven of these invasive nonnative

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species that have been inventoried and are known to occur within the Winnemucca Field Office District (BLM WFO 2002). No invasive, nonnative species inventories have been conducted by the BLM WFO within the geothermal operations area or along the transmission line corridor (BLM 2007a). However, Tall whitetop or Perennial pepperweed (*Lepidium latifolium*), Russian Knapweed (*Acroptilon repens*), hoary cress (*Cardaria draba*), Bull thistle (*Cirsium vulgare*), saltcedar (*Tamarix ramosissima*), and Scotch thistle (*Onopordum acanthium*), have been identified in the vicinity (Messmer 2007 and BLM 2007a)

3.5 Migratory Birds

Migratory birds may be found in the geothermal operations area and along the transmission line corridor as either seasonal residents or as migrants. Provisions of the Migratory Bird Treaty Act (16 USC 701-718h) prohibit the killing of any migratory birds, including the taking of any nest or egg, without a permit. Executive Order 13186, titled "Responsibilities of Federal Agencies to Protect Migratory Birds," was signed on October 1, 2001 to further enhance and ensure the protection of migratory birds. All birds in the Winnemucca Field Office district are considered neotropical migratory birds except for all the Gallinaceous birds (California quail, sage grouse, chukar partridge, gray partridge, ring-necked pheasant, mountain quail, and sharp-tailed grouse) [BLM WFO 2002].

The only migratory bird reported to nest in the geothermal operations area is the burrowing owl (SRK Consulting 2007) (see Section 3.19). Northern harrier and multiple other migratory birds are also likely to nest in the geothermal operations area and along the transmission line corridor.

3.6 Native American Religious Concerns

The BLM WFO initiated consultation activities with the Lovelock Tribe and Winnemucca Tribe via certified letter sent November 14, 2006. Follow-up calls were made to the Lovelock Tribe on January 24, 2007 and to the Winnemucca Tribe on February 6, 2007 and July 16, 2007 (Valentine 2007).

3.7 Threatened and Endangered Species

Pursuant to the requirements of Section 7(c) of the Endangered Species Act of 1973, as amended, for federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) concerning species listed under the Act, a request for information regarding threatened and endangered species which may occur in the geothermal operations area and along the transmission line corridor was sent to the USFWS on June 5, 2007. The USFWS responded with a letter that identified the bald eagle (*Haliaeetus leucocephalus*), a threatened species, as the only listed or proposed species known to potentially occur in the Project area (USFWS 2007). The bald eagle was subsequently removed from the federal list of threatened and endangered species effective August 8, 2007 (Federal Register 72(130), July 9, 2007). The bald eagle is managed as a BLM sensitive species (see Section 3.19) and continues to be protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

3.8 Wastes, Hazardous or Solid

Hazardous materials, hazardous waste, and solid (non-hazardous) waste are not normally considered to be part of the natural environment, but result from human activities within the natural environment (BLM WFO 2002). There are no known hazardous wastes or hazardous

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materials known to occur in the geothermal operations area or along the transmission line corridor. Numerous federal and state laws and regulations have been enacted and are enforced to ensure that hazardous materials, hazardous waste and solid wastes are properly handled, stored, and disposed.

3.9 Water Quality (Surface and Ground) and Water Quantity

The geothermal operations area is located entirely within the roughly 474-square mile Desert Valley Wash watershed of the Upper Quinn subbasin of the Black Rock Desert basin of the Black Rock Desert-Humboldt River subregion of the Great Basin Region (Hydrographic Unit Area (HUC) 1604020109) (see Appendix C, Figure 10).

The Nevada State Engineer of the Division of Water Resources, Department of Conservation and Natural Resources (NDCNR-DWR) places the geothermal operations area into the 1,052 square mile Desert Valley Hydrographic Area (Number 31 of 232 in the State of Nevada) of the Black Rock Desert Hydrographic Region (Number 2 of 14 in the State of Nevada) (NDCNR-DWR 2005).

Topographic maps show no cold water springs within the vicinity of the geothermal operations area, although several, including Barbara Worth Spring, are located further up the western slope, or on the eastern slope, of Blue Mountain. No thermal (hot) springs are known in the area (NBMG 2007). Only ephemeral stream channels, which flow during or immediately after rainfall events and do not support riparian vegetation, are found in the vicinity of the geothermal operations area.

The thick layers of rock and stream debris from the surrounding mountains, as well as deposits from ancient lakes, which fill the valley are the principal reservoirs of ground water (Sinclair 1962). This ground water reservoir is primarily recharged by rainfall and snowmelt which falls on the surrounding mountains and the few ephemeral streams which flow only during or immediately after rain. The hydrographic area has an estimated perennial yield (the amount of ground water which can be withdrawn indefinitely) of 9,000 acre-feet annually (NDCNR-DWR 2007a). The amount of ground water in storage in the upper few hundred feet of the valley fill is estimated at about 40,000 acre-feet per foot of water-filled sediments (Sinclair 1962).

Ground water is generally of higher quality around the edge of the hydrographic area where the ground water flow off the mountains can be produced before it comes into contact with the saltier sediments deposited in the center of the valley by the ancient lakes (Sinclair 1962). Ground water in the vicinity of the geothermal operations area is reported to be of marginal quality for crop irrigation (Sinclair 1962).

The Desert Valley Hydrographic Area is a "designated" area or ground water basin. This is a basin designated by the Nevada State Engineer when permitted ground water rights approach or exceed the estimated average annual recharge and the water resources are being depleted or require additional administration (NDCNR-DWR 2005). The Nevada State Engineer has additional authority in the administration of the water resources within a designated ground water basin.

Desert Valley Hydrographic Area has committed water rights of about 38,200 acre-feet annually, with irrigation (27,400 acre-feet annually) and mining and milling (7,500 acre-feet annually) comprising over 91 percent of the committed water rights. The project has approved water right

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applications for about 2,200 acre-feet of ground water annually from the four proposed water wells.

Known ground water wells located in the ground water basin within approximately five miles of the geothermal operations area are located to the north, west and southwest of the geothermal operations area. The closest are three ground water wells located between one and two miles southwest of the closest proposed geothermal wells. Most are completed at depths of between 250 and 350 feet below ground surface, although one of the wells located closest to the geothermal operations area was completed to a depth of 750 feet. (NDCNR-DWR 2007b).

Over the thirty year period from 1961 to 1991, water levels measured in these wells remained very stable (USGS 2007a). From 1991 to 2006, annual water level data available from the Nevada State Engineer showed a gradual decline of about two to five feet, or about 0.1 to 0.3 feet per year (NDCNR-DWR 2007c). Though most wells continued this same trend in 2007, a few of the wells had a much steeper rate of decline over the last year, between three and six feet per year. Depth to the water table varied from 50 feet to 75 feet, with the greater depth measured in wells closer to Blue Mountain (USGS 2007a).

A 1990 sample of ground water from a well in Section 30 of T36N R34E (about four miles southwest of the southwest corner of the geothermal operations area) showed that the ground water was acceptable quality for irrigation, having a specific conductance of about 740 microsiemens per centimeter (USGS 2007a). The water was relatively rich in sodium (Na), calcium (Ca), chloride (Cl), sulfate (SO₄) and bicarbonate (HCO₃). Most of the ground water samples collected in 2005 by NGP from the ground water wells located in the ground water basin within approximately five miles of the geothermal operations area showed very similar water quality (NGP 2007). However, several of the wells sampled by NGP had calculated total dissolved solids (TDS) concentrations in excess of 1,000 ppm, one up to 2,690 ppm TDS (see Appendix C, Figure 2). These higher salinity ground water wells had higher sodium (Na) to calcium (Ca) and chloride (Cl) to sulfate (SO₄) ratios than the rest of the ground water wells, suggesting that the waters sampled from these wells included a percentage of geothermal fluids leaked naturally from the much deeper geothermal reservoir.

The geothermal reservoir to be developed by the project is located at an expected depth of about 6,000 feet, far below the 250 to 750 feet deep completion interval of the shallow ground water wells to the west. The geothermal fluid to be developed by the project would be a neutral alkali-chloride type water typical of high temperature geothermal systems in the Great Basin (NGP 2006). Based on analyses conducted to date, it is rich in sodium (Na), potassium (K) and chloride (Cl), but relatively poor in calcium (Ca), magnesium (Mg) and bicarbonate (HCO₃). Trace elements measured to date include lithium (Li) and boron (B), which are also typical of Great Basin high-temperature geothermal systems. The calculated total dissolved solids concentration is about 3,600 parts per million (ppm) (SEM 2006).

The northernmost portion of the transmission line corridor is also located in the Desert Valley Wash watershed, although most of the transmission line corridor is located in the 340 square mile Humboldt River/Dun Glen watershed of the Lower Humboldt subbasin of the Humboldt basin of the Black Rock Desert-Humboldt River subregion of the Great Basin Region (HUC 1604010804) (see Appendix C, Figure 10).

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3.10 Geology and Minerals

There are no known geologic hazards which could adversely affect the proposed action within the geothermal operations area or along the transmission line corridor (Cates 2007). The area around Blue Mountain is relatively aseismic, with no earthquakes recorded within 35 miles in the 1990 to 2001 time period (USGS 2007b). The probability of a magnitude 6 or greater earthquake occurring within 50 km (31 mi) within the next 50 years is low, only 10 to 15 percent (USGS 2007b).

Blue Mountain has been mapped as Triassic Singus Formation which consists primarily of mudstones, siltstones, and sandstones which display local silicification and argillic alteration. The Singus Formation has been intruded by late Jurassic to Cretaceous mafic dikes. There are several faults exposed on Blue Mountain. The North Fault is located on the north side of Blue Mountain and trends east-northeast. The Southwest Fault is located along the southern part of Blue Mountain and trends northwest. The West and Central Faults are located on the west side of Blue Mountain. The Big Fault trends northeast and transects both the West and Central Faults. The East Fault trends north-northeast and transects the Big Fault at the north end of the Project area (Szybinski 2004). The geothermal fluids to be produced for the project are believed to circulate through the deep basement faults and the highly faulted flank of Blue Mountain (Szybinski 2007).

The southern portion of the transmission line corridor is located in an area that is mapped as Quaternary dune and Lake Lahontan deposits. The central portion of the transmission line corridor is located in an area that is mapped as Quaternary alluvial fan materials on the east side of the Eugene Mountains. The northern portion of the transmission line corridor crosses the railroad tracks in an area that is mapped as Lake Lahontan sediments. This area is called Pronto Pass and it connected the Humboldt River portion of Lake Lahontan to the Desert Valley portion of Lake Lahontan (Adams et. al, 1999).

The Eugene Mountains consist primarily of upper Triassic and Jurassic Auld Lang Syne Group, which consist of slate, phyllite, hornfels, quartzite, limestone, shale, and siltstone. The Triassic rocks have been intruded by Cretaceous granodiorites, and covered in some places by Quaternary basalts. The intrusion of the granodiorites created the ore bodies that have been mined at the Springer Tungsten Mine which is located within the Mill City Mining District (Johnson, Maureen G. 1977).

There are 91 active mining claims on the public lands within the unit area and 76 active mining claims on the public lands along the transmission line corridor and vicinity (BLM 2007b). Numerous gold exploration holes have been drilled in the unit area. A deposit recently identified approximately 100 feet north of the DB-2 (37-14) well in the SW1/4NE1/4 of Section 14, T36N, R34E (see Appendix C, Figure 2) is the only known deposit of salable minerals within the geothermal operations area and along the transmission line corridor (Cates 2007).

3.11 Soils

Soil types within the geothermal operations area were identified in the Soil Survey of Humboldt County, Nevada East Part 2002 (USDA NRCS 2002). Ninety percent of the surface-disturbing activities associated with the geothermal operations would occur primarily within the Hawsley fine sand (4 to 15 percent slopes) soil association. Ten percent of the surface disturbing activities associated with the geothermal operations would occur within the Davey-Hawsley soil

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association. The Hawsley and Davey soils are very deep, somewhat excessively drained soils that formed in alluvium from mixed sources. Erosion hazard is slight for water and high for wind.

Soil types in the Humboldt County portion of the transmission line corridor were also identified in the Soil Survey of Humboldt County, Nevada East Part 2002 (USDA NRCS 2002). Six different Humboldt County soil associations are crossed by the transmission line: eight percent of the entire transmission line crosses the Boton-Isolde association, thirteen percent crosses the Weso-Trocken association, seven percent crosses the Oxcorel-Beoska-Whirlo association, two percent crosses the Soughe-Hoot association, sixteen percent crosses the Davey-Hawsley association, and two percent crosses the Hawsley fine sand (4 to 15 percent slopes) soil association. These soils typically have a slight to moderate erosion hazard by wind. General descriptions for each soils series can be found in Table 5.

Soil types in the Pershing County portion of the transmission line corridor were identified in the Soil Survey of Pershing County, Nevada, East Part (USDA SCS 1994). Five different Pershing County soil associations are crossed by the transmission line: eighteen percent of the entire transmission line crosses the Oxcorel-Beoska-Whirlo association, five percent crosses the Knott-Snapp (Moderately Steep)-Knott association, sixteen percent crosses the Weso association, six percent crosses the Raglan association, and seven percent crosses the Goldrun association. With exception of the Goldrun association, the erosion hazard is typically slight for water and wind. The Goldrun association has a very severe erosion hazard by wind and a slight erosion hazard by water. General descriptions for each soils series can be found in Table 5.

Table 5: Soil Series Horizon Profiles

Soil Series	Horizon Profile
Hawsley	Typically the surface layer consists of fine sand about 3 inches thick and the substratum consists of fine sand to a depth of greater than 60 inches.
Goldrun	
Isolde	
Davey	The surface soils consist of a loamy fine sand to a depth of 5 inches. The subsoil consists of a fine sandy loam, sandy loam to a depth of 14 inches and a fine sand, loamy fine sand to a depth of 67 inches.
Weso	Typically the surface layers consist of very fine sandy loam about 5-7 inches thick. The subsoil of fine sandy loam, very fine sandy loam or loam about 11-12 inches thick, and the substratum consists of stratified very gravelly loamy sand to fine sandy loam to a depth greater than 60 inches.
Oxcorel	Typically the surface layer consists of a gravelly very fine sandy loam to a depth of 5 inches. The subsoil layers consist of a clay, clay loam to 24 inches and a very gravelly sandy loam, very gravelly loam to a depth of 60 inches.
Hoot	Typically the surface layers consist of a very gravelly loam to a depth of 6 inches; the subsoil consists of extremely gravelly clay loam to a depth of 15 inches; and the substratum consist of unweathered bedrock to 15 inches.
Whirlo	Typically the surface layer consists of a gravelly very fine sandy loam to a depth of 14 inches. The subsoil layers consist of a very gravelly fine sandy loam to 43 inches and a stratified very gravelly coarse sandy loam to very gravelly loam to a depth of 60 inches.

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Soughe	Typically the surface layer consists of an extremely gravelly fine sandy loam to a depth of 4 inches. The subsoil layers consist of very gravelly clay loam, very gravelly sandy clay loam and very gravelly loam to a depth of 14 inches. The substratum consists of unweathered bedrock to a depth of 18 inches.
Knott	The surface soils consists of cobbly very fine sandy loam to a depth of 4 inches. The subsoil consists of clay, gravelly clay to a depth of 18 inches, and an indurated duripan to a depth of 34 inches. The substratum consists of a very gravelly coarse sandy loam, very gravelly sandy loam, very gravelly loamy sand to a depth greater than 60 inches.
Beoska	Typically the surface layer consists of gravelly very fine sandy loam to a depth of 5-13 inches. The subsoil layers consist of silt loam, silty clay loam, clay loam to a depth of 25 inches and very gravelly sandy loam, very gravelly loam to a depth of 60 inches.
Snapp	Typically the surface layer is a cobbly very fine sandy loam, very fine sandy loam to a depth of 5 inches. The subsoil layers are a clay, gravelly clay, gravelly clay loam, gravelly loam, extremely gravelly loamy sand to a depth of greater than 60 inches
Trocken	Typically the surface layer consists of a gravelly very fine sandy loam to a depth of 5 inches. The subsoil is a stratified extremely gravelly loamy coarse sand to very cobbly loam to a depth of greater than 60 inches.
Raglan	Typically the surface layers consist of a silt loam to a depth of 7 inches. The subsoil layers consist of a silt loam, stratified very fine sandy loam to silty clay loam to a depth of 60 inches.
Boton	Typically the surface layer consists of a very fine sandy loam from 0-5 inches. The subsurface layers consists of a silt loam to a depth of greater than 60 inches.
Essal	The surface layer consists of a loamy fine sand to a depth of 2 inches. The substratum consists of a stratified very fine sand to silt loam to a depth greater than 60 inches.
Panlee	The surface layer consists of a very fine sandy loam to a depth of 10 inches. The subsoils consist of a very gravelly very fine sandy loam, very cobbly silt loam and indurated duripan to a depth of 45 inches. The substratum consists of a weathered bedrock to a depth greater than 55 inches.

3.12 Vegetation

Botanical field surveys were taken during the appropriate floristic period (Tiehm 2006a 2006b, 2007a and 2007b). Nevada Natural Heritage Program (NNHP) and the Nevada Native Plant Society (NNPS) files were checked to identify rare plants that could occur in the Project vicinity (see Section 3.19). A general baseline biological survey was completed in the late-winter and spring of 2007 (SRK Consulting 2007).

Eight vegetation types were recorded. Vegetation types varied in species composition and abundance due to elevation, moisture, and soil type, but mostly due to a recurrent fire history (SRK Consulting 2007). Cheatgrass (*Bromus tectorum*) was the dominant understory species in each of the vegetation types encountered.

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The geothermal operations area is predominantly comprised of annual grassland, annual grassland-big sagebrush, and fourwing saltbrush-Indian ricegrass.

The proposed transmission line corridor and alternative extend through annual grassland, salt desert shrub-annual grassland, spiny hopsage-annual grassland, big sagebrush-annual grassland, and salt desert shrub vegetation communities.

Three, 300-foot square laydown staging areas will be created during construction of the transmission line. One each will be constructed in annual grassland, salt desert shrub-annual grassland, and spiny hopsage-annual grassland vegetation communities. An 80-foot square switching station will be constructed by SPPCo at the terminus of the transmission line in big sagebrush-annual grassland vegetation.

3.13 Wildlife Resources

A baseline biological survey of the geothermal operations area, and the proposed and alternative transmission line corridors were undertaken in the late-winter and spring of 2007 (SRK Consulting 2007). Table 6 provides a list of game and prominent wildlife species observed or reported to occur.

Table 6: Prominent Wildlife and Game Species

Mammals	Birds	Raptors	Reptiles
Pronghorn antelope (<i>Antilocapra americana</i>)	Horned lark (<i>Ermophila alpestris</i>)	Golden eagle (<i>Aquila chrysaetos</i>)	Western whiptail lizard (<i>Cnemidophorus tigris</i>)
Mule deer (<i>Odocoileus hemionus</i>)	Western meadowlark (<i>Sturnella neglecta</i>)	Prairie falcon (<i>Falco mexicanus</i>)	Leopard lizard (<i>Gambelia wislizenii</i>)
Black-tailed jack rabbit (<i>Lepus californicus</i>)	Sage sparrow (<i>Amphispiza belli</i>)	Northern harrier (<i>Circus cyaneus</i>)	Western fence lizard (<i>Sceloporus occidentalis</i>)
White-tailed antelope ground squirrel (<i>Ammospermophilus leucurus</i>)	Brewer's sparrow (<i>Spizella breweri</i>)	--	Great basin rattlesnake (<i>Crotalus oreganus lutosus</i>)
Coyote (<i>Canus latrans</i>)	Rock wren (<i>Salpinctes obsoletus</i>)	--	--
Kit fox (<i>Vulpes macrotis</i>)	Burrowing owl (<i>Athene cunicularia</i>)	--	--
Bobcat (<i>Lynx rufus</i>)	Chukar (<i>Alectoris chukar</i>)	--	--
Kangaroo rat (<i>Dipodomys deserti</i>)	--	--	--

Source: SRK Consulting 2007

A variety of other mammals, including rodents and bat species, and migratory birds occur in the geothermal operations area, along the transmission line corridor and in the vicinity. Bat species are likely occupants of the mines in the vicinity and may forage in the area.

3.14 Range Resources

The geothermal operations area is located in the Blue Mountain Allotment. This allotment comprises 60,348 acres (32,255 acres public lands administered by the BLM WFO, and 28,093 acres private lands) and supports 2,315 animal unit months (AUMs) during the grazing

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year (March 1 through February 28) (Pearson 2007). An AUM is the amount of forage needed to sustain one cow, five sheep, or five goats for a month (BLM WFO 2002).

There is one BLM livestock grazing permit holder authorized to graze cattle in the Blue Mountain Allotment. Livestock numbers fluctuate seasonally from 250 to 609 head which graze the public and private lands within the allotment from September 1 through April 30 annually. Livestock are removed from the allotment from May 1 through August 31 annually. Grazing permit information can be found in Table 7.

Table 7: Blue Mountain Allotment Grazing Permit Information
"Permit Holder A" Information

Livestock #	On Date	Off Date	% Public Land	Animal Unit Months
500	03/01	04/30	56	562
250	09/01	09/30	56	138
500	10/01	10/31	56	285
600	11/01	01/31	56	1016
609	02/01	02/28	56	314
				Total 2,315

The transmission line corridor is located in the Humboldt Valley Allotment. This allotment comprises 222,562 acres (105,190 acres public lands administered by the BLM WFO, 1 acre public land administered by the Bureau of Reclamation and 117,371 acres private lands) and supports 2,901 AUMs during the grazing year (March 1 through February 28) (Pearson 2007).

There are four BLM livestock grazing permit holders authorized to graze cattle in the Humboldt Valley Allotment. The livestock numbers fluctuate seasonally for two of the four permits and the grazing seasons vary with livestock. The Humboldt Valley allotment is not grazed by livestock during August and September. Grazing permit information can be found in Table 8.

Table 8: Humboldt Valley Allotment Grazing Permit Information

"Permit Holder B" Information

Livestock #	On Date	Off Date	% Public Land	Animal Unit Months
472	03/01	06/15	23	382
238252	06/16	06/30	23	29
400422	10/22	01/21	23	294
446472	01/22	02/28	23	136
				Subtotal 841

"Permit Holder C" Information

Livestock #	On Date	Off Date	% Public Land	Animal Unit Months
285	03/01	07/15	100	1284
114	10/24	02/28	100	480
				Subtotal 1,764

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"Permit Holder D" Information

Livestock #	On Date	Off Date	% Public Land	Animal Unit Months
47	03/01	07/31	100	236
				Subtotal 236

"Permit Holder E" Information.

Livestock #	On Date	Off Date	% Public Land	Animal Unit Months
30	06/01	07/31	100	60
				Subtotal 60
				Total 2,901

3.15 Recreation

Off Highway Vehicle (OHV) use, hiking, and hunting are the predominant recreational activities within the geothermal operations area. Four small game guzzlers, located on Blue Mountain east of the geothermal operations area, provide additional hunting opportunities for game birds. Organized, competitive off-road motorcycle racing also occurs seasonally (Gulley 2007). Hunting and OHV use are the main recreational activities along the transmission line corridor.

3.16 Visual Resources

The BLM initiated the visual resource management (VRM) process to manage the quality of landscapes on public land and to evaluate the potential impacts to visual resources resulting from development activities. VRM class designations are determined by assessing the scenic value of the landscape, viewer sensitivity to the scenery, and the distance of the viewer to the subject landscape. These management classes identify various permissible levels of landscape alteration, while protecting the overall visual quality of the region. They are divided into four levels (Classes I, II, III, and IV). Class I is the most restrictive and Class IV is the least restrictive (BLM 1986).

The geothermal operations area and northern portion of the transmission line corridor is located in a VRM Class IV area. The objective of Class IV is to provide for management activities that require major modification of the existing landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic landscape elements (BLM 1986).

The northern portions of the transmission line corridor are also located in VRM Class IV areas. Approximately 3 miles of intermittent VRM Class III area would be crossed near the shared terminus of the proposed and alternative transmission line corridor. The remaining portions of the transmission line corridor are located within VRM Class IV areas. The objective of Class III is to partially retain the existing character of the landscape and allow moderate changes that do not dominate the view (BLM 1986).

The geothermal operations area is located in relatively flat terrain on the western slope of Blue Mountain, and is situated at elevations between 4,200 and 4,500 feet. Viewed from the west, the dominant foreground feature is a low flat remnant of Lake Lahontan. The foreground is dominated by a continuous stand of sagebrush and shadscale that are light to dark green.

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Grasses occupy the spaces between the larger plants and varies in color from dark green to light yellow-brown, depending on the season. A very prominent horizontal line in the vegetation marks the transition between the flat lying lower portion of the geothermal operations area and the slightly inclined mid-ground. The mid-ground, which is where most of the proposed Project activities are located, consists of a slightly inclined alluvial fan transitioning into low hills, mostly rounded with a few angular areas. The vegetation is smooth and continuous and consists primarily of grasses with a few scattered shrubs and mustards. The colors range from dark green to bright yellow to light brown depending on the season of the year. The transition from the mid-ground to the back ground is marked by a horizontal line that is irregular and discontinuous and presents a strong color, vegetation, and topographic contrast. The dominant feature of the landscape is Blue Mountain, which rises from the valley floor to an elevation of 7,342 feet. Blue Mountain consists of angular to sub-rounded pyramidal forms with diagonal lines. The rocks are reddish-brown. The vegetation is continuous and dotted with dark green Juniper trees.

The transmission line corridor is located in the gently sloping foothills and relatively flat terrain east of the Eugene Range. Similar to the geothermal operations area, grasses occupy most of the foreground view with rolling landscape in the middle ground and mountainous ranges in the background from most view points along the transmission line corridor.

3.17 Economic Values

The closest population center to the proposed Project is Winnemucca, in Humboldt County. Adjacent population centers/counties are Lovelock, in Pershing County and Battle Mountain, in Lander County. Pertinent economic values are provided in Table 9.

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Table 9: Economic Values Data

	Total Population	Housing			Labor	
		Housing Units	Occupied (%)	Median Value (\$) of owner-occupied	Labor Force	Leading Employers
Pershing County (U.S. Census Bureau 2007a)	6,693	2,389	82.1	82,200	2,478	<ul style="list-style-type: none"> • Management, professional and related industries (22.7%) • Service occupation (19.9%) • Sales and office industry (18.9%)
Lovelock (U.S. Census Bureau 2007b)	2,003	957	81.8	81,700	917	<ul style="list-style-type: none"> • Service occupation (25.9%) • Management, professional and related industries (23.2%) • Production, transportation, and material moving occupations (19.9%)
Imlay (U.S. Census Bureau 2007e)	407	250	69.2	56,200	163	<ul style="list-style-type: none"> • Construction, extraction, and maintenance occupations (39.2%) • Sales and office industry (30.4%) • Management, professional and related industries (17.6%)
Lander County (U.S. Census Bureau 2007c)	5,794	2,780	75.3	82,400	2,741	<ul style="list-style-type: none"> • Management, professional and related industries (24.4%) • Construction, extraction, and maintenance occupations (21.7%) • Production, transportation, and material moving occupations (19.1%)
Battle Mountain Census Data Place (CDP) (U.S. Census Bureau 2007d)	2,871	1,455	72.4	79,600	1,473	<ul style="list-style-type: none"> • Management, professional and related industries (22.1%) • Construction, extraction, and maintenance occupations (20.1%) • Production, transportation, and material moving occupations (19.9%)
Humboldt County (U.S. Census Bureau 2007e)	16,106	6,954	82.4	117,400	7,653	<ul style="list-style-type: none"> • Management, professional and related industries (25.7%) • Sales and office industry (21.7%) • Construction, extraction, and maintenance occupations (20.5%)
Winnemucca (U.S. Census Bureau 2007f)	7,174	3,280	83.4	124,000	3,562	<ul style="list-style-type: none"> • Management, professional and related industries (30.4%) • Sales and office industry (25.0%) • Construction, extraction, and maintenance occupations (14.9%)

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Over the approximate 30-year life of the project, approximately \$11,000 sales/use tax; \$660,000 in annual net proceeds tax; \$7,526,000 in BLM royalties; and \$2,965,000 in other royalties is expected to be generated (NGP 2007).

3.18 Lands and Realty

Based on information contained in the master title plat maps of the area (BLM 2007c), several rights-of-way (ROW) or other authorizations have been granted on the public lands within the geothermal area and transmission line corridor. These include the Union Pacific Railroad; the SPPCo 120 kV power line; the Southwest Gas Corp. gas pipeline; Jungo Road; an aggregate materials site; a buried fiber optic cable; a pumping plant site; the Gaskell station grounds; a road; NGP authorization to use portions of the "primary access road" for access to exploration sites; the SPPCo powerline to the Jungo Sprint site; and a well, storage tanks, pond and magnesium chloride storage site.

3.19 Candidate and Special Status Species

The U.S. Fish and Wildlife Service (USFWS), Nevada Natural Heritage Program (NNHP), and the BLM WFO were consulted to identify sensitive and special status species with the potential to occur in the geothermal operations area and along the transmission line corridor. Literature searches were also conducted to determine habitat for the listed species prior to field surveys (SRK Consulting 2007).

The USFWS identified the bald eagle and yellow-billed cuckoo (*Coccyzus americanus occidentalis*) as the only listed, proposed or candidate species under the Endangered Species Act of 1973 (ESA) known to potentially occur in the Project area (USFWS 2007). The pygmy rabbit (*Brachylagus idahoensis*) and sage grouse (*Centrocercus urophasianus*) were also identified as species of concern that could occur in the area.

The NNHP conducted a database and map search for a five-kilometer radius around T36N, R34E. The NNHP also searched 1.0 mile on each side of the proposed transmission line corridor. Within this search area, the Nevada viceroy (*Limenitis archippus lahontani*) and Nevada oryctes (*Oryctes nevadensis*) were identified as taxa recorded within either the geothermal operations area or along the transmission line corridor. Habitat may be available for the obscure scorpionflower (*Phacelia inconspicua*), a Nevada BLM special status species; the Lahontan indigobush (*Psoralea kingii*), a Taxon determined to the Vulnerable by the NNHP; and the Western Snowy Plover (*Charadrius alexandrinus nivosus*), a Nevada BLM sensitive species.

In addition to the species identified by the USFWS and the NNHP, the burrowing owl (*Athene cunicularia*) was identified as a BLM sensitive species.

Bald eagles are not known to nest in Humboldt County but roosts may exist along the Humboldt River (SRK Consulting 2007). Bald eagle occurs in northern Nevada primarily as a winter resident. In the winter, bald eagle concentrate where food is prevalent, typically near open water where fish and waterfowl prey are available. However, when the Humboldt River freezes, bald eagle may forage for rabbit in upland areas such as the study area (SRK Consulting 2007). The bald eagle is known to seasonally occur in the vicinity of the proposed project (Covert 2007).

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The western subspecies of the yellow-billed cuckoo requires large blocks of riparian habitat (particularly woodlands with cottonwoods and willows) with dense understory vegetation for breeding. There is no yellow-billed cuckoo habitat in the study area.

The Pygmy rabbit typically occurs in areas of tall, dense sagebrush (*Artemisia* spp.) cover, and are highly dependent on sagebrush to provide both food and shelter throughout the year. Due to historic fires and cheatgrass dominant revegetation of burned areas, there is no suitable pygmy rabbit habitat in the study area, and there is no record of pygmy rabbit occurring in the geothermal operations area and along the transmission line corridor (Covert 2007).

Sage grouse are upland game birds found on the sage-steppe habitats throughout the West, primarily in areas dominated by sagebrush (*Artemisia* spp.). Optimum sage grouse habitats are generally characterized as mature sagebrush stands with dense understory of native perennial grasses and native forbs. Grouse depend on sagebrush exclusively during the winter. Sagebrush/perennial grasslands also provide critical breeding and nesting habitats for sage grouse. Meadows, riparian areas, irrigated hay fields and other moist areas within or adjacent to sagebrush habitat provide summer foraging area. The study area is not recognized as a sage grouse brooding or strutting area (BLM WFO 2001), and sage grouse habitat does not exist in the geothermal operations area and along the transmission line corridor (Covert 2007).

The Nevada viceroy, a butterfly species, was identified as potentially occurring in the area. The species is generally associated with willows along the Humboldt River. A small patch of willow habitat occurs near the terminus of the transmission line/switching station area. This habitat was judged insufficient to support the Nevada viceroy and none were observed during the biological survey of the area in June 2007 (SRK Consulting 2007).

The Nevada oryctes was identified as having potential to occur in the area. The geothermal operations area and alternative transmission line corridor were surveyed for this plant species, including a former known location, and no individuals of this species were observed (SRK Consulting 2007). Oryctes occupies areas of deep loose sand of stabilized dunes, washes, and valley flats, on various slopes and aspects; and it is dependent on sand dunes or deep sand in Nevada (NNHP 2001). The Hawsley, Goldrun and Isolde soils consist of deep sand. Approximately ninety percent of the surface disturbing activities associated with the geothermal operations and approximately twenty-five percent of the transmission line would occur primarily within these soil series (see Section 3.11).

The Lahontan indigobush is dependent on sand dunes or deep sand and is typically found at 4,140-5,250 feet elevations (NNHP 2001). The Hawsley, Goldrun and Isolde soils consist of deep sand. Approximately ninety percent of the surface disturbing activities associated with the geothermal operations and approximately twenty-five percent of the transmission line would occur primarily within these soil series (see Section 3.11).

The Obscure scorpionflower is typically found in relatively deep, undisturbed, organic-rich soils on fairly steep, concave north- to northeast-facing slopes where snow drifts persist well into spring, on small, otherwise barren terraces in small clearings in shrub fields dominated by *Artemisia tridentata vaseyana* in association with *Holodiscus microphyllus*, *Symphoricarpos rotundifolius*, and *Leymus cinereus* (NNHP 2001). Habitat does not exist for this species in the study area (Thiem 2007a)

The Western snowy plover is a small shorebird foraging above the below mean high-water line of coastal beaches, gathering invertebrates from sand surface, kelp, marine-mammal

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carcasses, or low foredune vegetation. Habitat does not exist for the Western snowy plover within the geothermal operations area or along the transmission line corridor.

The burrowing owl is a bird of conservation concern to the USFWS and it is a BLM sensitive species. In Nevada, the sparsely vegetated habitats preferred by burrowing owls are predominantly found in the salt desert scrub habitat type. Burrowing owls breed throughout Nevada in salt desert scrub, Mojave shrub, and some sagebrush habitat, as well as in agricultural landscapes. Burrowing owl is known to occur in the geothermal operations area and was observed in one location along the proposed transmission line corridor in a prior survey of the area (SRK Consulting 2007).

No other candidate or special status species are known to occur in the geothermal operations area and along the transmission line corridor.

3.20 Fire Resources

The proposed well field and power plant are located between two fire management units (FMUs), the Eugene's/Slumbering Hills and the Desert Valley FMU. The proposed transmission line corridor skirts the east flank of the Eugene's/Slumbering Hills FMU. Plant communities located within these FMUs are dominated by the salt desert shrub community and annual grasslands at lower elevations and valley floors (see Section 3.12). Generally, facilities such as the power plant, pipelines, ancillary facilities and the transmission line corridor are located within fuel Model 1. Fuel model 1 is described as fire spread being governed by fine herbaceous fuels that have cured or are nearly cured. Surface fires move rapidly through cured grass and shrub present is less than one-third of the area.

Fire regimes for the Eugene's/Slumbering Hills FMU are primarily IIs or IVs. The regimes for the Desert Valley FMU are primarily IVs or Vs. A natural fire regime is a general classification of the role fire would play across a landscape in absence of modern human mechanical intervention. Fire regimes are classified based on the average number of years between fires (fire frequency) combined with severity (amount of replacement) of the fire on dominant vegetation.

Table 10: Fire Regimes

Fire Regime Number	Frequency (years)	Severity
I	0-35	Low & Mixed
II	0-35	Replacement
III	35-100	Mixed
IV	35-100	Replacement
V	200+	Replacement

Cheatgrass invasion alters fire frequency from historic regime intervals to shorter cycles of 5 years or less (Note fire history below).

A fire regime conditions class (FRCC) is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001). This classification is based on a relative measure describing the degree of departure for the natural (historical) fire regimes. One hundred percent of the Desert Valley FMU and ninety seven percent of the Eugene's/Slumbering Hills FMU is condition class 3. FRCC class 3 is a high departure from the central tendency of the natural regime, primarily due to the effects from wildfire.

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Fire History

There have been 7 fires within the project vicinity in recent years, totaling 105,124 acres burned. All of the fires have been caused by lightning.

The Blue Mountain fire occurred in 1999 in the vicinity of the proposed well field and power plant. This fire burned about 11,521 acres of public and private lands. A number of fires burned along the transmission line corridor and vicinity. These included the Keystone 2000 fire which burned 6,370 acres and the Keystone 2001 fire which burned 13,583 acres. On July 6 2007, the Tungsten fire ignited and ultimately burned 61,950 acres. Of the remaining three fires, two burned in the upper reaches of the Eugene Mountains and one small fire burned on the top of Blue Mountain (Johnson 2007).

4 ENVIRONMENTAL CONSEQUENCES

4.1 Air Quality

4.1.1 Proposed Action

Fugitive dust would be generated from earth-moving activities and travel on unpaved roads during power plant, drill pad, pipeline, road construction and drilling activities. Based on implementation of environmental protection measures specified by NGP, water would be applied to the ground during the construction and utilization of the drill pads and access roads as necessary to control dust (see Section 2.1.10). Each of the well pads, access roads and the power plant site would be surfaced with aggregate to minimize dust. The dust which could be generated when drilling with air would be controlled by a separator/muffler, and only the air and water vapor would be discharged to the air.

Geothermal operations area soils consist of fine sands which are susceptible to potentially high wind erosion. An NDEP-BAPC Surface Area Disturbance Permit, documenting the areas of proposed disturbance and the best practical dust control methods to be used, will be required for the project because the surface disturbed by the project would be greater than 5 acres. Best practical dust control methods applicable to the project activities include use of water trucks to spray water on disturbed areas on a regular basis; pre-watering of areas to be disturbed; graveling of roadways, storage areas and staging areas; posting and limiting vehicle speeds to 10 to 15 miles per hour, and use of wind fences to reduce wind impacts. Implementation of the applicable best practical dust control methods, through compliance with the Surface Area Disturbance Permit, would minimize fugitive dust emissions during construction, operation and decommissioning of the project.

Combustion emissions of criteria air pollutants [nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), and particulate matter less than or equal to 10 microns in diameter (PM₁₀)], criteria air pollutant precursors [volatile organic compounds (VOCs)] and air toxics (small quantities of diesel PM, acetaldehyde, benzene, and formaldehyde) would be released during well drilling and construction activities from the diesel engines used.

Small quantities of naturally occurring non-condensable gases, such as carbon dioxide (CO₂), hydrogen sulfide (H₂S), nitrogen (N₂), and methane (CH₄), would be emitted to the air during geothermal well testing and power plant operation (unless a totally binary power plant is constructed, in which case the power plant would not emit these non-condensable gases). The emission of H₂S from the power plant would be regulated by the NDEP-BAPC, which must ensure that the H₂S emissions from the Project do not exceed the Nevada AAQS. Further, the proposed action includes the commitment that the non-condensable gases, including the H₂S, would be exhausted to the atmosphere through an exhaust stack and the cooling tower to disperse the air pollutants and ensure that the Nevada AAQS are not exceeded.

Should a wet-cooling tower be built and operated, particulates would be created when the water droplets entrained in the air forced through the cooling tower evaporate. The quantity and size of these particulates (called aerosols) would depend on the source of the cooling water. If the source is steam condensate, which contains very little dissolved solids, particulate emissions would be small. If ground water is used as the source of the cooling water, particulate emissions would be greater. These particulate emissions are regulated by NDEP-BAPC to ensure that the particulate AAQSs are not exceeded.

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If a binary (or combined steam-binary) power plant is constructed, small quantities of the binary working fluid (typically isopentane) would be expected to be released to the atmosphere from gaskets, rotating seals, and flanges during operations. These releases are typically regulated through a permit issued by BAPC to ensure that these emissions do not result in ambient concentrations of ozone (which can be created from the reaction of ambient concentrations of hydrocarbons and NO_x) in excess of the applicable AAQS.

4.1.2 Alternative 1

The air quality impacts from construction, operation, maintenance and reclamation of Alternative 1, would be identical to those described for the proposed action.

4.1.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts to air quality from the No Action Alternative.

4.2 Cultural Resources

4.2.1 Proposed Action

Cultural resources determined eligible for the NRHP must retain integrity of location, design, setting, materials, workmanship, feeling, or association. Adverse effects occur when integrity is diminished, directly or indirectly, in any of the characteristics of a historic property that qualify that property for inclusion in the NRHP.

The BLM and the State Historic Preservation Officer (SHPO) have agreed that potential adverse effects to landscapes adjacent to National Historic Trails can be mitigated to no adverse effect when a BLM Class II visual resource management (VRM) objective is achieved. As defined in BLM Manual H-8410-1, the VRM Class II objective is retention of the existing character of the landscape, where the level of change may be seen, but should not attract the attention of the casual observer, and should repeat basic elements of form, line, color, and texture found in the predominant characteristic landscape.

The proposed action transmission line alignment crosses a segment of the California Emigrant Trail in Section 29, T34N, R35E. This segment of the California Emigrant Trail was classified by the OCTA volunteers as an OCTA Class 1 & 2, and Native-X classified this segment as an OCTA Class 2. This segment was also considered a contributing element for the California Emigrant Trail's NRHP eligibility.

To help evaluate the potential effects of the transmission line crossing of the California Emigrant Trail a photosimulation of the transmission line was prepared (see Appendix B, Photos 1 and 2). A photograph looking north-northeast was taken from a point on the California Emigrant Trail approximately 300 feet south-southwest of the proposed transmission line crossing (see Appendix C, Figure 6). Using the known heights and locations of features in the photograph, scaled images of the transmission line poles and conductors were created in the photograph in the appropriate locations.

The proposed action transmission line alignment crossing of the California Emigrant Trail in Section 29 would not result in retention of the existing character of the landscape. The strong vertical lines of the wooden poles would result in a moderate degree of contrast with the existing predominant characteristic landscape, consisting of flat plains to the northeast in the foreground

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and middleground and the conical mountains in the background. The level of change would attract the attention of the casual observer. Thus, the proposed action transmission line alignment crossing of the California Emigrant Trail would have an adverse effect to the California Emigrant Trail's integrity of setting, and indirect impacts on the integrity of feeling, and association (see Appendix B, Photos 1 and 2).

The proposed action transmission line alignment crosses a segment of the Idaho Stage Road in Section 20, T34N, R35E. This segment of the Idaho Stage Road was classified by the OCTA volunteers as an OCTA Class 1, and Native-X classified this segment as an OCTA Class 2. This segment was also considered a contributing element for the Idaho Stage Road's NRHP eligibility. Because the setting, feeling and association of the Idaho Stage Road at the point where the proposed action alignment of the transmission line would cross was judged to be essentially identical to the crossing point of the California Emigrant Trail, no photosimulation of the proposed action alignment of the transmission line crossing of the Idaho Stage Road was prepared.

The proposed action transmission line alignment crossing of the Idaho Stage Road in Section 20 would also not result in retention of the existing character of the landscape. Like the effects to the California Emigrant Trail, the strong vertical lines of the wooden poles would result in a moderate degree of contrast with the existing predominant characteristic landscape, consisting of flat plains to the northeast in the foreground and middleground and the conical mountains in the background. The level of change would attract the attention of the casual observer. Thus, the proposed action transmission line alignment crossing of the Idaho Stage Road would have an adverse effect to the Idaho Stage Road's integrity of setting, and an indirect impact on the integrity of feeling, and association.

The following recommended measures are recommended to reduce visibility impacts from the California Emigrant Trail and Idaho Stage Road crossings.

Mitigation Measures:

Wood crossmembers and braces, or non-reflective metal, if metal is the only choice, would be used.

Non-reflective wire/cable/conduit would be used for the main transmission lines.

Butt treated transmission line poles would be used.

The average spacing of 300-660 feet between transmission line pole structures would be increased to the maximum extent possible where the transmission lines cross the visually sensitive trails/roads.

The Tungsten water pipeline is considered eligible to the NRHP under criteria A, C and D. The proposed action would also impact this resource's integrity of setting and indirect impacts on feeling and association.

4.2.2 Alternative 1

The Alternate 1 transmission line alignment crosses a segment of the California Emigrant Trail in Section 31, T34N, R35E. This segment of the California Emigrant Trail was unclassified by the OCTA volunteers (it was labeled as a "?"). Native-X classified this segment as an OCTA Class 5 because this segment of the California Emigrant Trail has been compromised or

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obliterated by the Tungsten mine road, a power line, a water pipe ditch and a natural gas pipeline. This segment was considered a non-contributing element for the California Emigrant Trail's NRHP eligibility.

A photosimulation of the Alternative 1 alignment of the transmission line crossing of the California Emigrant Trail started with a photograph taken looking northeast from a point on the California Emigrant Trail approximately 400 feet southwest of the proposed Alternative 1 transmission line crossing (see Appendix B, see Photos 3 and 4 and Appendix C, Figure 6). The scaled images of the transmission line poles and conductors were created in the photograph using the known heights and locations of features in the photograph.

From this location the Alternative 1 transmission line alignment crossing of the California Emigrant Trail in Section 31 would result in retention of the existing character of the landscape. The strong vertical lines of the wooden poles and horizontal lines of the cross ties and conductors would result in a weak degree of contrast with the existing predominant characteristic landscape, consisting of the road, the fences and the electric distribution line. The level of change would not attract the attention of the casual observer.

A second photosimulation of the Alternative 1 alignment of the transmission line crossing of the California Emigrant Trail was prepared using a photograph taken looking southwest from a point on the California Emigrant Trail approximately 6,900 feet (1.3 miles) north-northeast of the proposed Alternative 1 transmission line crossing (see Appendix B, see Photos 7 and 8, and Appendix C, Figure 6). This point is approximately the same point from which Photo 1 was taken, except that Photo 7 was taken in the opposite direction. As before, the scaled images of the transmission line poles and conductors were created in the photograph using the known heights and locations of features in the photograph.

From this location the Alternative 1 transmission line alignment crossing of the California Emigrant Trail in Section 31 would result in retention of the existing character of the landscape. The very faint vertical lines of the wooden poles and horizontal lines of the cross ties at this distance would result in a weak degree of contrast with the existing predominant characteristic landscape, consisting of flat plains in the foreground and middleground and the rounded shapes of the hills and mountains in the background. The level of change would not attract the attention of the casual observer. Thus, the Alternative 1 transmission line alignment crossing of the California Emigrant Trail would have no direct or indirect adverse effect to the California Emigrant Trail's integrity of setting, feeling, and association.

The Alternative 1 transmission line alignment also crosses a segment of the Idaho Stage Road in Section 31, T34N, R35E. This segment of the Idaho Stage Road appears to have been classified by the OCTA volunteers as an OCTA Class 1. Native-X classified this segment as an OCTA Class 5 because this segment of the Idaho Stage Road has been compromised or obliterated by the Tungsten mine road, a power line, a water pipe ditch, a north-south road to some electrical equipment and a natural gas pipeline. This segment was considered a non-contributing element for the Idaho Stage Road's NRHP eligibility.

The photosimulation of the Alternative 1 alignment of the transmission line crossing of the Idaho Stage Road used a photograph taken looking north-northeast from a point on the Idaho Stage Road approximately 400 feet south-southwest of the proposed transmission line crossing (see Appendix B, Photos 5 and 6). The images of the transmission line poles and conductors were created in the photograph using the heights and locations of the existing features in the photograph.

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The Alternative 1 transmission line alignment crossing of the Idaho Stage Road in Section 31 would also result in retention of the existing character of the landscape. The strong vertical lines of the wooden poles and horizontal lines of the cross ties and conductors would result in a weak degree of contrast with the existing predominant characteristic landscape, consisting of the roads, the electric distribution line, the fences and the water tank. The level of change would not attract the attention of the casual observer.

The photosimulation of the Alternative 1 alignment of the transmission line crossing of the California Emigrant Trail presented in Appendix B, Photos 7 and 8, also shows the Alternative 1 transmission line alignment crossing of the Idaho Stage Road. The Alternative 1 transmission line alignment crossing of the Idaho Stage Road in Section 31 would also result in retention of the existing character of the landscape. The very faint vertical lines of the wooden poles and horizontal lines of the cross ties at this distance would result in a weak degree of contrast with the existing predominant characteristic landscape, resulting in a level of change which would not attract the attention of the casual observer. Thus, the Alternative 1 transmission line alignment crossing of the Idaho Stage Road would have no direct or indirect adverse effect to the Idaho Stage Road's integrity of setting, feeling, and association.

The mitigation measures recommended for the proposed action would also be equally applicable for Alternative 1.

The Tungsten water pipeline has lost integrity in the area where the Alternative 1 transmission line route will cross it. This is due to the modern upgrades and replacements to the pipeline (additional wells, tanks, transmission lines, replacement of pipe, and the addition of gas pipeline). No adverse impacts are anticipated.

4.2.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on cultural resources from the No Action Alternative.

4.3 Invasive, Nonnative Species

4.3.1 Proposed Action

Project activities could contribute to the spread of invasive, nonnative species within the geothermal operations area and along the transmission line corridor through the proposed surface disturbing activities and the number of construction and drilling vehicles involved. NGP will comply with special lease stipulations requiring that seed mixtures used to re-vegetate disturbed areas be "weed free" and that an invasive, nonnative species control program consisting of monitoring and eradication for species listed on the Nevada Designated Noxious Weed List be implemented. However, project construction equipment could bring invasive, nonnative plant propagules into the geothermal operations area and along the transmission line corridor. The following mitigation measure is recommended to decrease the potential for the spread of invasive, nonnative plant species into the geothermal operations area and transmission line corridor from project construction equipment.

Mitigation Measure:

For a period of three years following the commencement of construction, project sites shall be inventoried by the lessee for the presence of invasive, nonnative species. Inventory data shall be reported to the BLM WFO project Lead within one week of receipt

by the lessee. The area shall be treated with BLM certified pesticides following BLM approval of a pesticide use proposal if species are present.

Following the three year period, periodic inventory for the presence of invasive nonnative species would be performed at project sites, with treatment occurring as necessary. The periodic inventory and treatment would occur for as long as the lessee is present at the site.

The following mitigation measure is recommended to decrease the potential for the spread of invasive, nonnative plant species from project construction equipment.

Mitigation Measure:

All trucks (excluding pick-up trucks) and construction equipment should be washed to remove soil and plant parts. A central washing facility would be provided for this purpose at a location either in Winnemucca or at a facility approved by the authorized officer. The washing station should not be placed within 150 feet of any body of water or ditch line, nor where the wash water can flow downslope.

Following the implementation of these mitigation measures, there would still be some potential for the spread of invasive, nonnative species within the geothermal operations area and along the transmission line corridor, which would be a residual impact.

4.3.2 Alternative 1

The construction, operation, maintenance and decommissioning of Alternative 1 would differ from the proposed action only by a small increase in the total length of the transmission line. The impacts of Alternative 1 from invasive, nonnative species would not be different from that of the proposed action. The invasive, nonnative species mitigation measures recommended for the proposed action also would be equally applicable to Alternative 1.

4.3.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on invasive, nonnative species from the No Action Alternative.

4.4 Migratory Birds

4.4.1 Proposed Action

Project construction (regardless of the season constructed) would result in the direct loss of potential migratory bird habitat until reclaimed. Project construction is temporary and short-term. Migratory birds would adjust and relocate to abundant similar habitat in the Project vicinity and beyond.

Project-generated construction and drilling noise (estimated at an average 83 decibels (dBA) at a distance of 50 feet) could also keep some migratory birds away from areas generating this noise (typically areas of new surface disturbance). Other indirect effects could result from general human activity, which could displace individuals or reduce breeding success of species that are sensitive to human activity.

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The indirect impacts would be temporary and short-term for the proposed construction and drilling operations, but would continue over the life of the Project for power plant operations. Migratory birds would be able to re-occupy the disturbed areas upon completion of the Project and site reclamation. There should be negligible residual impacts to migratory birds.

To avoid the potential for violation of the MBTA during project construction, NGP will comply with special lease stipulations to conduct inventories for migratory bird nests and limit ground disturbing activities if conducted during the migratory bird-nesting season (see Appendix A) and has committed to implement this stipulation for project construction activities outside of the geothermal operations area. The following mitigation measure is recommended to document NGP's commitments and the requirements of the lease stipulations to avoid the potential for violation of the MBTA.

Mitigation Measure

Initial ground disturbing activities would not be conducted during the migratory bird nesting season (March through July) unless necessary, and then only after inventories for migratory birds and nests were conducted by a qualified biologist acceptable to the BLM. This survey would be conducted to identify either breeding adult birds or nest sites within the specific areas to be disturbed. If active nests are present within these areas to be disturbed, NGP would coordinate with the authorized officer to develop appropriate protection measures for these sites, which may include avoidance, construction constraints, and/or the establishment of buffers.

4.4.2 Alternative 1

The construction, operation, maintenance and reclamation of Alternative 1 would differ from the proposed action only by a small increase in the total length of the transmission line. The impacts of Alternative 1 to migratory birds would not be different from that of the proposed action. The migratory birds mitigation measures recommended for the proposed action also would be equally applicable to Alternative 1.

4.4.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on migratory birds from the No Action Alternative.

4.5 Native American Religious Concerns

4.5.1 Proposed Action

No response to the BLM request for consultation and input has been received from either the Lovelock Tribe or the Winnemucca Tribe. No further consultation is anticipated.

4.5.2 Alternative 1

The impacts to Native American Religious Concerns, from the construction, operation, maintenance and reclamation of Alternative 1 would be the same as those described for the proposed action.

4.5.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on Native American Religious Concerns from the No Action Alternative.

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4.6 Wastes, Hazardous and Solid

4.6.1 Proposed Action

Diesel fuel, lubricants, hydraulic fluids and drilling chemicals (drilling mud, caustic soda, barite, etc.), would be transported to, stored on and used by the project at the proposed drill sites (see Table 11). The project must conform to both federal and state requirements for handling these hazardous materials. Typical of most construction projects, the storage and use of these materials may result in minor, incidental spills of diesel fuel or oil to the ground during fueling of equipment, filling of fuel storage tanks, and handling lubricants. Other incidental spills could be associated with equipment failures such as ruptured hoses. The project includes the development of a hazardous material spill and disposal contingency plan which would describe the methods for cleanup and abatement of any petroleum hydrocarbon or other hazardous material spill.

Table 11: Materials and Chemicals Commonly Used During Well Drilling

Product	Quantity Used	Quantity Stored
Drilling Mud Gel (Bentonite Clay)	200,000 lbs	100 lb sacks on pallets
Salt (NaCl)	80,000 lbs	50 lb sacks on pallets
Barite (BaSO ₄)	12,000 lbs	50 lb sacks on pallets
Tannathin (Lignite)	2,500 lbs	50 lb sacks on pallets
Lime (Calcium Hydroxide)	2,000 lbs	50 lb sacks on pallets
Caustic Soda (Sodium Hydroxide)	1,000 lbs	50 lb sacks on pallets
Diesel Fuel	30,000 gals	6,000 gal tank
Lubricants (Motor Oil, Compressor Oil)	1,000 gals	55 gal drums
Hydraulic fluid	200 gals	55 gal drums
Anti-Freeze (Ethylene Glycol)	100 gals	55 gal drums
Liquid Polymer Emulsion (partially hydrolyzed polyacrylamide / polyacrylate (PHPA) copolymer)	100 gals	5 gal buckets

Well workover operations may involve placing a dilute mixture of hydrochloric (muriatic) and hydrofluoric acids down the well. The amount of dilute acid placed in the well bore (which can vary from 10,000 gallons to 50,000 gallons or more) is determined by calculating the amount of each type of mineral to be dissolved. Concentrated (35%) hydrochloric acid and 40% ammonium fluoride solution (to make the hydrofluoric acid) are trucked to the site and mixed on site with water by experienced contractors. The dilute acid mixture is placed in the cased well bore, followed by water to push the mixture into the geothermal reservoir. After dissolving the minerals in the geothermal reservoir, the water and now spent acids are flowed back through the well to the surface where they tested, neutralized if necessary (using sodium hydroxide or crushed limestone or marble), and discharged to the reserve pit.

The project must comply with BLM requirements to ensure that any geothermal fluid encountered during the drilling does not flow uncontrolled to the surface. These include the use of "blow-out" prevention equipment during drilling and the installation of well casing cemented into the ground.

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After drilling operations are completed, the liquids from the reserve pits would either naturally evaporate, or be removed as may be necessary to reclaim the reserve pits. The non-hazardous, non-toxic residual solid contents of the pits would be mixed with the excavated rock and soil and buried by backfilling the reserve pit.

The small quantities of solid wastes (paper trash and garbage) generated by the project would be transported offsite to an appropriate landfill facility. Portable chemical toilet wastes would be removed by a local contractor. Given NGP's compliance with the associated lease stipulations, no effects would result from solid wastes generated by the project. The disposal of these wastes would be a residual impact of the project.

Small quantities of hazardous waste would be generated by construction operations. Typically these wastes would be in the form of empty drums or spent lead acid batteries used for construction equipment. Construction activities typically generate waste oils, oily rags, and oil impregnated absorbent materials used to clean up minor spills from construction equipment. However, most waste generated from the construction activities would be solid (non-hazardous) waste.

Hazardous materials stored on site during normal power plant operations include diesel fuel for the fire pump and standby generator, lubricating oils, and small quantities of paint, antifreeze, cleaning solvents, battery acid, transformer insulating fluid, and laboratory reagent chemicals. Air pollution abatement chemicals, geothermal fluid handling chemicals and cooling tower treatment chemicals will also be stored on site. These materials will typically be stored within secondary containment and there will be little potential for adverse effects from spills or releases of these materials.

If the power plant uses binary technology, substantial quantities of the binary working fluid, isopentane, would be stored and used (though not consumed or intentionally released). Isopentane is a flammable but non-toxic hydrocarbon similar to, but less volatile than propane.

Small quantities of typical office and industrial trash will be generated during power plant operations. Similar to construction wastes, the operations waste will be removed from the site by a local waste contractor and deposited in an offsite disposal facility authorized to accept the wastes. Sanitary wastes will be handled by a septic system constructed as part of the power plant facilities.

Proper handling, storage and disposal of these hazardous materials, hazardous wastes and solid wastes in conformance with federal and state regulations would ensure that no soil, ground water, or surface water contamination would occur with any adverse effects on the environment or worker health and safety (BLM 2002).

The following mitigation measures are provided to help prevent contamination of soils and reduce the potential for contamination of the reserve pit.

Mitigation Measures:

Absorbent pads or sheets would be placed under likely spill sources.

The hazardous material spill and disposal contingency plan will be submitted to and approved by BLM and made readily available onsite before operations begin.

4.6.2 Alternative 1

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The impacts from wastes, hazardous and solid, from the construction, operation, maintenance and reclamation of Alternative 1 would be the same as those described for the proposed action.

4.6.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on wastes, hazardous and solid, from the No Action Alternative.

4.7 Water Quality (Surface and Ground)

4.7.1 Proposed Action

The geothermal wells would be drilled using non-toxic drilling mud to prevent the loss of drilling fluids into the rock and the risk of contamination to any aquifers from the drilling fluid. Reserve pits would be constructed at each site for the containment and temporary storage of drilling mud, drill cuttings, geothermal fluid and storm water runoff from the constructed well pad. Because non-toxic drilling mud would be used, the reserve pits are not proposed to be lined. Additionally, the bentonite drilling muds discharged into the reserve pits would tend to act as a liner, in the same way they prevent the loss of drilling fluids in the well bore into the rock.

Contamination of the ground water aquifer used for irrigation as a result of the temporary discharges into the reserve pits is unlikely. However, the geothermal fluid transferred from the long term flow tests of the proposed geothermal wells into the larger reserve pit constructed adjacent to well 26A-14 could leak into the ground water aquifer used for irrigation as this basin is unlined and has not received any discharge of bentonite drilling muds which would act as a liner. The following mitigation measure is provided to help reduce the potential for contamination of any local shallow ground water or soils from the discharges to the reserve pits.

Mitigation Measure:

The length of time which geothermal fluid, storm water runoff or other liquids are temporarily stored in any reserve pit would be minimized. Use of reserve pits is limited to the active drilling and testing operations. Fluids from flow testing would only be produced in accordance with permits and plans. The larger reserve pit constructed adjacent to well 26A-14 would be treated with bentonite to minimize the infiltration of geothermal fluids into the shallow ground water aquifer. The fluid level in the larger reserve pit would be monitored daily during initial testing to verify the treatment. The results of the monitoring would be reported to the BLM.

During construction the project would consume about 150 acre-feet of ground water over about 18 months, principally for geothermal well drilling and dust control. This small quantity of water, obtained from existing county water wells, from one or more of the four water wells to be drilled on private land in Section 1 of T36N, R34E, or from temporary water wells drilled on the well pads, would have little potential for creating any adverse affect on the quantity of either surface waters or ground waters in or adjacent to the geothermal operations area.

Measures would also be taken by the project to minimize the affects of construction and unit operations on the quality of surface and ground waters. To minimize erosion and stream channel sedimentation, storm water runoff from undisturbed areas around the constructed well pads, power plant site and switching station would be directed into ditches surrounding the disturbed areas and back onto undisturbed ground consistent with best management practices for storm water. Access roads would also be constructed and maintained consistent with the

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best management practices for road construction applicable to the intended use (temporary or permanent) of the road. To minimize erosion and stream channel sedimentation, grading or clearing of the surface for construction of the transmission line would occur only when absolutely necessary for safe access or installing the conductors and would only occur within the proposed ROW.

The geothermal wells would be cased with steel to a depth below the shallow ground water reservoirs. The casing would be cemented into the ground to prevent the loss of any geothermal resource into, and prevent the contamination or mixing of, any shallow ground waters by the geothermal production or injection fluid.

The production of the geothermal fluid would likely decrease the pressure in the geothermal reservoir, which would tend to reduce the apparent natural leakage of geothermal fluids into the shallow ground water aquifer. The injection of geothermal fluid after passing through the power plant back into the geothermal reservoir would likely offset the pressure reductions caused by the production of geothermal fluids. However, the information currently available is not sufficient to predict exactly how the geothermal reservoir would react to the production and injection operations.

The Underground Injection Control Permit required for the project's injection program from the Nevada Department of Environmental Protection-Bureau of Water Pollution Control (NDEP-BWPC) would require that the injection program be designed and monitored to prevent degradation of underground sources of drinking water due to the geothermal fluid injection practices. The following mitigation measures are provided to monitor the implementation of the underground injection program to determine if it may be affecting the quality of any shallow ground water, and to remove or minimize any identified negative effects.

Mitigation Measures:

The quality of selected ground water wells would continue to be monitored to determine if the injection of geothermal fluids may be impacting the levels of geothermal fluid components in the produced waters. Ground water wells to be monitored would include some of those within the unit area with high total dissolved solids, as well as other existing or new ground water wells close to the geothermal operations area. Final design and implementation of the ground water quality monitoring program would occur before the commencement of geothermal production and injection operations.

In the case negative affects (increasing levels of geothermal fluid components) are recorded by the monitoring program, NGP would work with the BLM, NDOM, NDEP and the Nevada State Water Engineer to adjust geothermal fluid production or injection to remove or minimize negative affects to ground water wells or the geothermal resource.

NGP would also monitor produced geothermal fluids, and within 30 days of NGP's receipt of produced water analytical laboratory result(s), the BLM would be provided with a copy of the laboratory result(s). A map or written description of the sample collection point(s) would accompany the result(s).

Over the operational life of the project, accidental discharges of geothermal fluids, which could contaminate surface or ground waters, are unlikely because of frequent inspections and ultrasonic testing of the geothermal pipelines, pipeline flow and pressure monitoring and well pump and pipeline valve shutdown features. Contamination of surface or ground waters from

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spills of petroleum products (such as diesel fuel or lubricants) is also unlikely because the well pads and power plant site, where most petroleum products would be used and stored, would be bermed to contain and control any spills. NGP has also prepared an emergency spill containment plan to identify potential sources of spills and define emergency response actions to be initiated if a spill occurred.

During operations, for either a binary or flash type power plant, up to approximately 2,200 acre-feet of water would be consumed by evaporation per year for power plant cooling tower operation. Production of this water from geothermal steam condensate (if available) would have little chance of adversely affecting ground water levels in the existing water wells or reducing the flow of the springs located to the east of the geothermal operations area because the geothermal reservoir is isolated from these shallow reservoirs by a substantial thickness of generally impermeable rock.

If this water is pumped from the ground water wells to be drilled in the northeast corner of the geothermal operations area, there may be some potential for a reduction in the ground water levels over time.

Production of ground water for cooling tower operation would be unlikely to reduce the flow from the springs to the east of the geothermal operations area because these springs are located at higher elevations, upgradient, and perched above the water table of the ground water wells surrounding the geothermal operations area.

The water rights granted to NGP by the Nevada State Engineer to produce ground water from these wells for industrial use are subject to existing rights and must allow for some lowering of the static water level. The following mitigation measure is provided to monitor the potential effect of the shallow ground water production program to determine if it may be affecting the depth of the shallow ground water table.

Mitigation Measure

The depth to ground water in selected ground water wells would continue to be monitored to determine if the shallow ground water production program may be lowering the groundwater table. Ground water wells to be monitored would include existing or new ground water wells both close to and farther away from the geothermal operations area. Final design and implementation of the ground water level monitoring program would occur before the commencement of geothermal production and injection operations.

4.7.2 Alternative 1

The construction, operation, maintenance and decommissioning of Alternative 1 would differ from the proposed action only by the small increase in the total length of the transmission line. The water quality and water quantity impacts of Alternative 1 would not be measurably different from those of the proposed action.

4.7.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on water quality (surface and ground) from the No Action Alternative.

4.8 Geology and Minerals

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4.8.1 Proposed Action

There is the potential for simultaneous use of the geothermal operations area and along the transmission line corridor by both NGP and the locatable mineral claimants. There would be no residual impacts.

Production and use of the geothermal resources over the life of the project would extract heat from the geothermal reservoir rocks, potentially resulting in a slow reduction over time of the temperature of the produced geothermal fluid. The circulation of the geothermal fluids in the geothermal reservoir over the life of the project could also lead to some changes in the chemistry of the produced geothermal fluid. These potential geothermal fluid changes would be monitored over the life of the project.

4.8.2 Alternative 1

The impacts to geology and minerals from the construction, operation, maintenance and reclamation of Alternative 1 would be the same as those described for the proposed action.

4.8.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on geology and minerals from the No Action Alternative.

4.9 Soils

4.9.1 Proposed Action

The power plant, wellfield, pipelines and access roads are located on fine sand soils susceptible to potentially high wind erosion. Surface disturbance during construction of these project facilities may contribute to the wind erosion hazard of the soils. Based on implementation of environmental protection measures specified by NGP, water would be applied to the ground during construction activities as necessary to control dust (see Section 2.1.9). Each of the well pads, access roads to the power plant and the power plant site itself would be surfaced with aggregate to minimize dust and control wind erosion.

To a lesser extent, some of the soils within the transmission line corridor would also be susceptible to potentially high wind erosion. Transmission line construction and maintenance will occur adjacent to existing roads or from overland vehicles with less potential to remove vegetation that limit wind erosion.

An NDEP-BAPC Surface Area Disturbance Permit, documenting the areas of proposed disturbance and the best practical dust control methods to be use, will be required for the project because the surface disturbed by the project would be greater than 5 acres (see Section 4.7.1). Implementation of the applicable best practical dust control methods, through compliance with the Surface Area Disturbance Permit, would minimize fugitive dust emissions and soil erosion from wind during construction, operation and decommissioning of the project.

4.9.2 Alternative 1

The construction, operation, maintenance and reclamation of Alternative 1 would differ from the proposed action only by a small increase in the total length of the transmission line. The impacts of Alternative 1 to soils would not be different from that of the proposed action.

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4.9.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on soils from the No Action Alternative.

4.10 Vegetation

4.10.1 Proposed Action

Surface disturbance associated with construction activities within the geothermal operations area would result in the loss of vegetation over the life of the project, but would be recovered without residual impact after site reclamation at the end of the Project.

No new roads are expected for transmission line construction but overland vehicles would result in temporary damage to impacted vegetation within the transmission line corridor. Surface disturbance would occur during the auguring and installation of the H-frame transmission line poles. Unlike the longer term surface disturbance within the geothermal operations area, except for the small area occupied by the transmission line poles themselves, vegetation in most of the area occupied by the transmission line route can be allowed to recover after construction is completed.

Vegetation in the staging areas can also be allowed to recover after construction is completed. Vegetation in the area occupied by the switching station will be lost for the life of the Project, but could be recovered without residual impact after site reclamation at the end of the Project.

Disturbed areas could have an increase in cheatgrass compared to non-disturbed areas. As part of the Project, disturbed areas would be reclaimed in accordance with applicable BLM requirements. The following mitigation measure is recommended to seed disturbed areas with seed mixtures and minimize the spread of invasive, nonnative species.

Mitigation Measure

Unoccupied disturbed areas shall be seeded by the applicant as directed by the BLM Winnemucca Field Office using the following native seed mixture and application rate. Any variance in the mix would be coordinated first with the BLM Winnemucca Field Office.

BLM-Recommended Seed Mix:

Species	PLS LBS./Acre	Bulk LBS./Acre	PLS/sq. ft.
Sandberg bluegrass	1.90	2.00	38
Fourwing saltbush	3.00	5.00	4
Shadscale	3.00	5.00	4
Indian ricegrass	1.00	1.25	4
Totals	8.90	13.25	50

PLS = Pure Live Seeds

Following the implementation of this mitigation measure, there should be no residual impacts to vegetation in unoccupied areas of surface disturbance.

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4.10.2 Alternative 1

The construction, operation, maintenance and reclamation of Alternative 1 would differ from the proposed action only by a small increase in the total length of the transmission line. The impacts of Alternative 1 to vegetation would not be different from that of the proposed action. The mitigation measures recommended for the proposed action also would be equally applicable to Alternative 1.

4.10.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on vegetation from the No Action Alternative.

4.11 Wildlife Resources

4.11.1 Proposed Action

Surface disturbance associated with Project construction would result in the loss of wildlife habitat. The direct displacement of wildlife would result from the surface disturbance required for construction of the drilling pads, power plant site, pipelines, transmission line, switching station and access roads. A slight reduction in wildlife carrying capacity would be expected to occur for some species, but most wildlife would be expected to adjust and relocate to similar habitat that is abundant in the Project vicinity.

The transmission line poles would provide perching sites for raptors. The approximately 20-mile-long transmission line would also increase the potential for bird collisions, electrocution and bird mortality. However, NGP has agreed to adopting transmission line raptor protection practices which would minimize bird strikes with the transmission line and reduce bird mortality (APLIC 2006).

Project-generated noise could also keep some animals away from areas directly affected by surface disturbance during the construction, drilling and power plant operations. Other indirect effects could result from general human activity, which could displace individuals or reduce breeding success of species that are sensitive to human activity. The indirect effects would be temporary and short-term for the proposed construction and drilling operations, but would continue over the life of the Project for power plant operations. Wildlife would be able to re-occupy the disturbed areas upon completion of the Project and site reclamation. There should be no residual impacts to wildlife resources.

4.11.2 Alternative 1

The construction, operation, maintenance and reclamation of Alternative 1 would differ from the proposed action only by a small increase in the total length of the transmission line. The impacts of Alternative 1 to wildlife would not be different from that of the proposed action. The mitigation measures recommended for the proposed action also would be equally applicable to Alternative 1.

4.11.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on wildlife resources from the No Action Alternative.

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4.12 Range Resources

4.12.1 Proposed Action

The proposed action would disturb a very small percentage of the acres within the allotments. All Project activities are located away from sources of water in the vicinity and will not prevent livestock access to the available sources of water in the area.

To prevent access by cattle to areas which might be harmful to them, NGP has committed to fence reserve pits and the power plant site in conformance with the Gold Book, and has not proposed any Project activities which would substantially limit livestock's access to the undisturbed portions of the geothermal operations area.

Due to the small percentage of the allotment's acres lost to direct disturbance, NGP's fencing of those Project facilities potentially harmful to livestock, and the fact that Project facilities and practices would not prevent continued access by livestock to the undisturbed lands within the geothermal operations area and along the transmission line corridor, no impacts to range resources are expected.

4.12.2 Alternative 1

The construction, operation, maintenance and reclamation of Alternative 1 would differ from the proposed action only by a small increase in the total length of the transmission line. The impacts of Alternative 1 to range resources would not be different from that of the proposed action.

4.12.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on range resources from the No Action Alternative.

4.13 Recreation

4.13.1 Proposed Action

The Project does not propose any activity which would prevent continued access by recreational users to the public lands within the Project area. Project operations should also not impact the ability of hunters to access previous hunting grounds, or impact the abundance of game animals.

Air quality impacts to recreation users could include dust from vehicle traffic on unpaved roads and exhaust from construction vehicles. As discussed in Section 4.1, these would be short-term and temporary. NGP has also stated that water would be applied to the disturbed ground during the construction activities as necessary to control dust.

Project-generated noise and traffic could cause some recreational users of the geothermal operations area and transmission line corridor to stay away during the Project construction and drilling activities. These indirect effects would be temporary and short-term. The Project should have no residual impacts on recreation.

4.13.2 Alternative 1

The recreation impacts from construction, operation, maintenance and reclamation of Alternative 1 would be identical to those described for the proposed action.

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4.13.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on recreation from the No Action Alternative.

4.14 Visual Resources

4.14.1 Proposed Action

During the 45-day drilling operations the drill rig may extend up to about 175 feet above ground level. These operations will be 24-hour per day, 7 days per week. During drilling operations, the rig will be visible at distances of greater than one mile from the respective drill sites, and lights used when drilling at night would increase rig visibility. Impacts to visual resources from drilling operations would primarily affect the elements of line and color. Drilling operations will be temporary and short-term. The following mitigation measure is recommended to reduce visual impacts during drilling operations.

Mitigation Measure

All drill rig and well test facility lights would be limited to those required to safely conduct the operations, and would be shielded and/or directed in a manner which focuses direct light to the immediate work area.

Most power plant facilities will be single story or smaller and will not be visible at a distance from the power plant site. The tallest permanent structure on the power plant site will be the cooling towers estimated to be about 50± feet tall. Under some atmospheric conditions, cooling tower condensate plumes will rise several hundred feet into the air and will be visible from several miles distance to the south and west of the power plant site. Power plant and wellfield facilities will be painted a color to blend with the environment. Blue Mountain will obscure views of the power plant site and cooling tower plume from populated areas east of the geothermal operations area.

Within the transmission line corridor, the wooden H-frame transmission line poles will be about 65-80 feet tall with an approximately 30-foot-wide crossbar. The poles will be about 700 feet apart on average and interconnected with three parallel conductor wires. Double H-frame poles will be used at turning points along the transmission line corridor. The proposed 20-mile-long transmission line will be intermittently visible to travelers at middle ground distances of 2.5 to 5 miles from Highway 80.

The proposed transmission line corridor will be generally parallel to the Eugene Range in the background. The transmission line will be constructed cross country but segments of the line will cross or run parallel to existing unpaved access roads along the transmission line corridor from which the transmission line will be visually apparent in the foreground. The transmission line will add an extended linear feature to the landscape. Visual impacts from the transmission line on the historic Emigrant Trail and the Stage Coach Road are discussed in Section 4.2.

Project activities would be consistent with the Class III and IV classification of the area.

The following mitigation measures are recommended to reduce the visual impacts to permanent project related facilities within the geothermal operations area.

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Mitigation Measure

Permanent project facilities within the geothermal operations area would be painted a color, subject to approval by the authorized officer, which would blend with the landscape. Prior to painting, NGP would contact the Winnemucca Field Office project lead.

Permanent project facilities within the geothermal operations area would be limited to those required to safely conduct the operations, and would be shielded and/or directed in a manner which focuses direct light to the immediate work area.

The following mitigation measure is recommended to reduce the visual impacts from the switching station at the south end of the ROW corridor.

Mitigation Measure

The switching station at the south end of the ROW would be painted a color, subject to approval by the authorized officer, which would blend with the landscape. Prior to painting, NGP would contact the Winnemucca Field Office project lead.

4.14.2 Alternative 1

The construction, operation, maintenance and reclamation of Alternative 1 would differ from the proposed action only by a small increase in the total length of the transmission line. The impacts of Alternative 1 to visual resources would not be different from that of the proposed action. The mitigation measures recommended for the proposed action also would be equally applicable to Alternative 1.

4.14.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on visual resources from the No Action Alternative.

4.15 Economic Values

4.15.1 Proposed Action

Construction of the power plant, wellfield, pipelines, and access roads is expected to consist of 135 workers and is anticipated to last approximately 18-22 months. Construction of the transmission line, switching station, and laydown areas is expected to consist of 20-25 workers and is anticipated to last approximately 9 months. Some of these workers would be recruited locally, though most would be specialized workers from outside of the local area. Typically, non-local skilled workers do not bring families with them on these construction assignments. Therefore, most are expected to stay in local hotels or rental housing units.

Non-local construction workers typically are paid a *per diem* rate for daily housing and meal costs. Workers normally spend the *per diem* on motel accommodations or RV campground space rent, restaurants, groceries, gasoline, and entertainment. In addition, NGP likely would purchase or rent some portion of the equipment and supplies required to drill and complete the construction activities (such as grading equipment, fuel and tools) from local suppliers. This spending activity associated with the Project construction and drilling would have a small but positive effect on local businesses in Humboldt County.

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Operation of the project is expected to require 15 workers, and would not induce population growth in an area. Neither does the Project create or provide any infrastructure which would indirectly induce substantial population growth.

Over the life of the project, the sales/use tax and annual net proceeds tax generated will go to the State of Nevada for redistribution to Humboldt County. The 2005 Energy Act provides that the BLM rentals and royalties will be shared 50% to the State of Nevada and 25% will go directly to Humboldt County; until 2010, the remaining 25% of BLM rentals and royalties will go to BLM for redistribution to BLM offices. Private royalties will be distributed among the private land owners within the unit area.

4.15.2 Alternative 1

The impacts to economic values from the construction, operation, maintenance and reclamation of Alternative 1 would be the same as those described for the proposed action.

4.15.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts from economic values from the No Action Alternative.

4.16 Lands and Realty

4.16.1 Proposed Action

All project activities within the geothermal operations area are located away from the authorized ROWs, so there would be no impacts to lands and realty within the geothermal operations area.

Transmission line poles would not be located within any existing ROWs and no impacts are expected. The transmission line wires would pass over several land use authorizations, but would not interfere with any existing ROWs. No impacts are anticipated.

4.16.2 Alternative 1

The impacts to lands and realty from construction, operation, maintenance and reclamation of Alternative 1, would be identical to those described for the proposed action.

4.16.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on lands and realty from the No Action Alternative.

4.17 Candidate and Special Status Species

4.17.1 Proposed Action

Bald eagles are not known to use the geothermal operations area or transmission line corridor for nesting or roosting. However, it is possible that during extremely cold years when the Humboldt River freezes, bald eagles would hunt the uplands for rabbits (SRK Consulting 2007). Potential foraging habitat would be removed by the Project, but ample comparable upland foraging habitat exists in the Project vicinity. Transmission line poles constructed for the Project would provide suitable roosts for bald eagle.

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Burrowing owl habitat exists throughout much of the geothermal operations area with marginal habitat along the transmission line corridor. Burrowing owls have been observed along the access road to the Project power plant site and burrowing owl nesting was reported in the Project area in 2006 and 2007 (SRK Consulting 2007). The burrowing owl nest site that was located in 2006 is within a portion of the geothermal operations area planned for disturbance. Site construction activities could impact burrowing owl nesting. Mitigation measures requiring NPG to conduct inventories for migratory bird nests and limit ground disturbing activities if conducted during the migratory bird nesting season have been proposed (see Section 4.4).

There will be no impacts to the yellow-billed cuckoo, pygmy rabbit, sage grouse, and Nevada viceroy as no suitable habitat exists within the geothermal operations area or along transmission line corridor. Inventories conducted did not find Nevada oryctes within the geothermal operations area or along the transmission line corridor.

4.17.2 Alternative 1

The construction, operation, maintenance and decommissioning of Alternative 1 would differ from the proposed action only by a small increase in the total length of the transmission line. The impacts of Alternative 1 candidate and special status species would not be different from that of the proposed action.

4.17.3 No Action Alternative

The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on candidate and special status species from the No Action Alternative.

4.18 Fire Resources

4.18.1 Proposed Action

Implementation of the proposed action would increase the potential for human caused fires during construction and operation of the project. Accidental discharge during transportation and storage of flammable materials or chemicals (such as pentane or fuel) could accelerate the ignition of fires along Jungo Road or at the power plant site. Impacts from these fires would vary based on fire size and could result in the destruction of structures, livestock forage, and wildlife habitat.

Development of a hazardous material handling, storage and transportation plan would reduce the potential for fires (see Section 4.6). NPG has proposed environmental protection measures to further reduce the potential for human caused fires (see Section 2.1.10)

Power transmission lines have been known to start fires either from arching or electrocution of birds. These impacts would be low based upon the transmission lines being constructed within previously burned areas. Installation of anti electrocution perching sites on power poles and maintenance of roads and/or constructing fuel breaks along the Rights of Way would also reduce potential impacts.

4.18.2 Alternative 1

The impacts to fire resources from construction, operation, maintenance and reclamation of Alternative 1, would be identical to those described for the proposed action.

4.18.3 No Action Alternative

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The Project would not be constructed if the No Action Alternative is selected, so there would be no impacts on fire resources from the No Action Alternative.

5 CUMULATIVE IMPACTS ANALYSIS

The CEQ regulations for implementing NEPA (40 CFR 1508.7) define cumulative impacts as:

“... the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time”

The following analysis identifies other past, present or reasonably foreseeable future actions which, together with the project, may incrementally impact the environment, and addresses the potential cumulative impacts of these actions and the project.

5.1 Cumulative Impacts Assessment Area

The cumulative impact assessment area is the Desert Valley Wash and the Humboldt River/Dun Glen watersheds (see Appendix C, Figure 10). The Desert Valley Wash watershed is 281,456 acres and the Humboldt River/Dun Glen watershed is 303,215 acres.

5.2 Past and Present Actions

Past and present activities consist principally of agricultural development, livestock grazing, recreational activities, ROWs, transportation and access, wildfires, mineral exploration and geothermal exploration activities.

Agricultural development – The cultivation of crops, such as alfalfa, is a prominent activity on private land within the cumulative impacts assessment area, typically supported by irrigation facilities and associated utilities.

Livestock grazing – Livestock grazing has a long history in the region dating back to the early 1850's, as trading posts were established along the California trails. Today, it remains the dominant use of the cumulative impact assessment area. Throughout its history, ranching has remained a dispersed activity characterized by localized areas of more intensive use. The grazed acreage on private holdings is not subject to administration by the BLM. Portions of 6 different federally administered grazing allotments are also represented in the cumulative impacts assessment area: Blue Mountain, Jackson Mountain, Humboldt Valley, Sand Dunes, Prince Royal and White Horse allotments. In order to support the management of these allotments, a variety of range improvement projects have been implemented through the years including: fences, cattleguards, wells, spring developments, reservoirs, water pipelines and corrals.

Recreational activities – Dispersed recreation occurs within the cumulative impacts assessment area and includes wildlife viewing, hunting, off-highway vehicle use and camping.

ROWs – There are several major ROWs traversing the cumulative impacts assessment area, with the majority of them found along the railroad and Jungo Road. These ROWs include power transmission lines, telephone lines, oil and gas pipelines, railroad, irrigation support and gravel pits.

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Transportation and access – Past and present actions within the cumulative impacts assessment area are supported by an extensive transportation system which includes gravel County Roads and private unimproved roads or dirt roads and two-tracks on public lands. Most of these roads have their origin in mining exploration and ranching access and few are regularly maintained.

Wildfire – A number of wildfires have occurred within the cumulative impacts assessment area within the last 10 years. Most of the affected areas have been subjected to a variety of stabilization and rehabilitation treatments with mixed results.

Mineral exploration – Hundreds of active mining claims exist within the cumulative impacts assessment area, but there are less than 200 mining claims within the geothermal project operations area and along the proposed transmission line corridor. Only one area has activity under mining notice N24-83-071N. Nassau Ltd. conducted mining exploration operations which created a total of about six acres of disturbance since 1983. Approximately 4.3 acres of disturbance have since been reclaimed.

Geothermal exploration activities – NGP has conducted geothermal temperature gradient hole and slim well drilling activities within the cumulative impacts assessment area.

5.3 Reasonably Foreseeable Future Actions

The past and present actions discussed above are expected to persist for the next 30 years though the relative intensity of these actions could vary depending on a variety of factors. Given a relatively stable economy and increasing population, recreational use is expected to increase. Some activities such as off-road vehicle use will likely continue and/or increase over time (Gulley 2007a).

Reasonably foreseeable projects within the cumulative impacts assessment area include: a solid waste disposal facility, a gold mine project, and applications for land subdivisions within Pershing County.

Solid waste disposal facility – Jungo Land & Investments has been granted approval for a solid waste disposal facility (landfill) in Section 7, T35N, R33E. This project includes transport by rail of municipal waste from the Bay Area.

Gold Mine project – NewWest Gold is proposing a two phased gold mine exploration project located in : the entirety of sections 5, 7, 17, NW1/4, E1/2, SW1/4 of Section 9 and the W1/2 Section 21, T36N, R36E; the entirety of Sections 23 and 25, T37N, R35E; the entirety of Sections 19, 29, 31, and 33 T37N, R36E.

Land subdivisions – The Pershing County Planning Department reported applications for subdivisions of the following whole or partial sections into 40-acre parcels: entirety of Section 13, T34N, R33E; entirety of Section 15, T33N, R33E; entirety of sections 9 and 17, T33N, R34E; and the N1/2 of Section 23 and entirety of Section 25, T34N, R34E. These subdivision are legal actions only and no development plans have been submitted on any of the subdivided properties.

Tungsten Mine Reopening – Golden Predator Mine is re-activating the underground mine in Section 35, T34, R34E, and will be using the existing underground facilities, process plant, and several associated BLM ROWs. They plan to start construction of a precious metal process facility in 2008. No new surface disturbance on public land is expected.

5.4 Cumulative Impacts to Affected Resources

Impacts associated with past, present, and reasonably foreseeable future actions are generally created by ground or vegetation-disturbing activities that effect natural and cultural resources in various ways. Of particular concern is the accumulation of these impacts over time. This section of the EA considers the nature of the cumulative effect and analyzes the degree to which the proposed action, Alternative 1, and No Action Alternative contribute to the collective impact.

Inter-related resources with similar impacts have been grouped together for the cumulative impact analysis.

5.4.1 Air Quality

Past and present actions have generated fugitive dust, principally from surface disturbing activities and travel on unpaved roads.

Reasonably foreseeable future actions are expected to add to these fugitive dust emissions, although the increases could vary depending on a variety of factors.

Proposed Action

Fugitive dust would be generated by the proposed action but mitigated by implementation of environmental protection measures specified by NGP and the best practical dust control measures specified in the NDEP-BAPC Surface Area Disturbance Permit. Particulates emitted by the cooling tower are also regulated by NDEP-BAPC to ensure that standards are not exceeded. As a result, the potential for cumulative impacts from the proposed action are minimal.

Alternative 1

The potential cumulative impacts identified with Alternative 1 would be identical as those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on air quality.

5.4.2 Cultural Resources

Past and present actions on public and private lands have directly and indirectly affected the integrity of historic cultural resources determined eligible for the NRHP. Management of reasonably foreseeable future actions on public lands within the cumulative impact assessment area should prevent additional direct and indirect affects to these resources, although impacts to these resources may still occur from reasonably foreseeable future actions located on private lands.

Proposed Action

The proposed action transmission line alignment crossing of the California Emigrant Trail and Idaho Stage Road would have a direct adverse effect to the integrity of setting, and indirect impacts on the integrity of feeling, of these NRHP resources in areas with integrity of setting and feeling generally intact. In addition, recreational off-road vehicles driving down the tracks used

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for construction of the transmission line could be directed down the intact segments of these NRHP resources. As a result, the potential for cumulative impacts from the proposed action are high.

Alternative 1

The Alternative 1 transmission line alignment crossing of the California Emigrant Trail and Idaho Stage Road would have no direct or indirect adverse effects to these NRHP resources because they occur at locations where past and present actions have already affected the integrity of setting and feeling for these resources. In addition, recreational off-road vehicles driving down the tracks used for construction of the Alternative 1 transmission line would be prevented from transitioning to the intact segments of these NRHP resources by existing fencing or the historic tailings from the Nevada Tungsten Mine. As the segments crossed by the Alternative 1 transmission line alignment were determined to not be contributing elements for NRHP eligibility, the potential for cumulative impacts from Alternative 1 are minimal.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on cultural resources.

5.4.3 Invasive, Nonnative Species

Ground disturbances associated with past and present actions, and impacts associated with wildfire, have resulted in the expansion of invasive, nonnative species. Management actions associated with these species has lead to better control in some cases.

Reasonably foreseeable future activities would present additional opportunities for invasive, nonnative species introduction and proliferation. The number and size of mining and landfill-associated construction and operation activities could lend themselves to transporting invasive, nonnative species to areas where they had not previously existed.

Proposed Action

As mitigation measures to inventory and treat newly disturbed areas, and the washing of construction vehicles, are recommended for the proposed action, the potential cumulative impacts of the proposed action are minimal.

Alternative 1

The potential cumulative impacts identified with Alternative 1 would be identical as those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on invasive, nonnative species.

5.4.4 Migratory Birds, Wildlife, and Candidate and Special Status Species

Minor to moderate amounts of displacement have resulted from disturbances to wildlife and migratory bird habitat associated with past and present actions. Large areas of native habitat have been degraded from wildfires within the cumulative impacts assessment area.

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Minor amounts of additional displacement would occur from the reasonably foreseeable future actions. Impacts could also occur as these activities could displace migratory birds and wildlife or reduce breeding success of species that are sensitive to additional activity.

Mitigation measure(s) requiring surveys for candidate and special status species, and inventories for migratory bird nests, if conducted during the appropriate season, and limiting ground disturbing activities would help reduce the potential effects if implemented for the reasonably foreseeable future actions on public lands, as appropriate.

Proposed Action

Mitigation measures and environmental protection measures have been proposed or incorporated into the proposed action to limit the project effects to migratory birds, wildlife and candidate and special status species. Thus, the potential cumulative impact of the proposed action to migratory birds, wildlife, and candidate and special status species would be minimal.

Alternative 1

The potential cumulative impacts identified with Alternative 1 would be identical as those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on migratory birds, wildlife or candidate and special status species.

5.4.5 Wastes, Hazardous or Solid

The transportation, use, storage and disposal of hazardous materials and wastes are subject to numerous federal, state and local laws and regulations which are intended to protect the public and the environment, and which are applicable to each and all of these past, present and reasonably foreseeable future actions.

Hazardous materials are expected to be used by both the mineral exploration and development project, the mine re-opening and the landfill within the cumulative impacts assessment area, including petroleum fuels (principally diesel fuel), hydraulic fluid, lubricants and drilling chemicals and materials. Additional non-hazardous solid waste and liquids would also be generated by the reasonably foreseeable future projects, and the landfill project would import these solid wastes into the cumulative impacts assessment area.

Proposed Action

Proper handling, storage and disposal of the proposed action hazardous materials, hazardous wastes and solid wastes in conformance with federal and state regulations would ensure that no soil, ground water or surface water contamination would occur from the proposed action. Thus, the potential for cumulative impacts from the hazardous or solid wastes produced by the proposed action would be minimal.

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Alternative 1

The potential cumulative impacts identified with Alternative 1 would be identical as those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on wastes, hazardous or solid.

5.4.6 Water Quality (Surface and Ground) and Water Quantity

The Desert Valley Hydrographic Area has past and present committed water rights of about 38,000 acre-feet annually, which exceeds the estimated perennial yield of 9,000 acre-feet annually. However, over the thirty year period from 1961 to 1991, water levels measured in each of the known wells in the vicinity of the proposed action have remained very stable.

It is not known how much ground water the landfill may consume.

Proposed Action

The proposed action would consume up to approximately 2,200 acre-feet annually of ground water. If this water is pumped from the ground water wells to be drilled in the northeast corner of the geothermal operations area, there could be some potential for a measurable reduction in the ground water levels over time in the existing ground water wells in the area. The water rights granted to NGP by the Nevada State Engineer to produce ground water from these wells for industrial use are subject to existing rights and must allow for some lowering of the static water level. Thus, the potential for cumulative impacts from the ground water production from the proposed action would be minimal.

Alternative 1

The potential cumulative impacts identified with Alternative 1 would be identical as those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on water quality (surface and ground) and water quantity.

5.4.7 Geology and Minerals

Hundreds of active (past and present) mining claims are located within the cumulative impacts assessment area.

A gold exploration and mine development project, and the mine re-opening are also reasonably foreseeable future actions.

Proposed Action

As the additions of the reasonably foreseeable future actions to the proposed action would not change the potential for simultaneous use of the geothermal operations area or the transmission

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line corridor by NGP and the locatable mineral claimants, the potential for cumulative effects on geology and minerals from the proposed action would be minimal.

Alternative 1

The potential cumulative impacts identified with Alternative 1 would be essentially identical to those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative impacts on geology and minerals.

5.4.8 Soils and Vegetation

Wildfires have had a significant impact on soils and vegetation in the cumulative impacts assessment area. Native vegetation has been greatly reduced and replaced by cheatgrass. Substantial soil degradation and erosion has also occurred until the vegetation was reestablished. Prior to the Taylor Grazing Act, livestock grazing also contributed to substantial soil and vegetation resource impacts.

Reasonably foreseeable future activities would continue to slightly impact the soils and vegetation within the cumulative impacts assessment area due to disturbance and/or vegetation removal. Impacts from grazing are likely to change and continue to improve from present conditions.

Proposed Action

The mitigation measures and environmental protection measures proposed or incorporated into the proposed action would limit the project effects on soils and vegetation, so that the contribution of the proposed action to the cumulative effects on soils and vegetation would be minimal.

Alternative 1

The potential cumulative impacts identified with Alternative 1 would be identical as those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on soils and vegetation.

5.4.9 Range Resources

All of the past, present, and reasonably foreseeable future actions would be located within the Blue Mountain, Mormon Dan, Humboldt Valley, Prince Royal, White Horse, and Sand Dunes allotments. Past and present actions have caused minor impacts to livestock grazing in these areas.

Reasonably foreseeable future actions could add to cumulative increases in vegetation and soil disturbances, which could result in incremental losses in the availability of grazing used for livestock.

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Proposed Action

As the proposed action is not expected to result in any impacts to range resources, no cumulative impacts are expected from the proposed action.

Alternative 1

The potential cumulative impacts identified with Alternative 1 would be identical as those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on range resources.

5.4.10 Recreation

Dispersed recreation (wildlife viewing, hunting, and off-highway vehicle use) has and continues to occur within the cumulative impacts assessment area.

It is reasonably foreseeable that recreational use, especially off-road vehicle and similar uses, would continue to increase over time.

Proposed Action

The Project does not propose any activity which would prevent continued access by recreational users to the public lands within the geothermal operations area or transmission line corridor, and the proposed action should have no residual impacts on recreation. Thus, the potential for cumulative effects on recreation from the proposed action would be minimal.

Alternative 1

The potential cumulative impacts identified with Alternative 1 would be identical as those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on recreation.

5.4.11 Visual Resources

The geothermal operations area and the northern portion of the transmission line corridor are located in a VRM Class IV area. Most of the southern end of the transmission line corridor is located in a VRM Class III area. The past and present activities located on public lands have conformed to these VRM classes.

The only reasonably foreseeable future actions which might be visible to one another would be the power plant and the proposed landfill. The reasonably foreseeable actions on public land would be mitigated to blend in with the existing landscape.

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Proposed Action

The mitigation measures and environmental protection measures proposed or incorporated into the proposed action would limit the project effects on visual resources and ensure that the proposed action conforms to the applicable VRM classes. As a result, the cumulative effect on visual resources from the proposed action would be minimal.

Alternative 1

The potential cumulative impacts identified with Alternative 1 would be identical as those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on visual resources.

5.4.12 Economic Values

Past and present activities have had a generally positive economic impact. Generally positive economic impacts would also be expected from the reasonably foreseeable future projects, as some of the construction and operation activities would be contracted out to local contractors and builders, and some of the required supplies and construction materials could also be purchased from local merchants. Some positive economic impacts could also be realized from the rental of hotel rooms and purchase of meals and entertainment by construction workers.

Proposed Action

The contribution of the proposed action to these cumulative effects on economic values would be minimal to moderate.

Alternative 1

The potential cumulative impacts identified with Alternative 1 would be identical as those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on economic values.

5.4.13 Fire Resources

There have been seven fires within the cumulative impacts assessment area in recent years, all of which have been caused by lightning.

The reasonably foreseeable future actions would increase the potential for human caused fires during construction and operations.

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Proposed Action

Implementation of the proposed action would also increase the potential for human caused fires during construction and operation of the proposed action. However, the contribution of the proposed action to the cumulative effects on wildfires would be minimal

Alternative 1

The potential cumulative impacts identified with Alternative 1 would be identical as those identified for the proposed action.

No Action Alternative

No Project activities would be undertaken if the No Action Alternative were selected. There would be no cumulative effects on fire resources.

5.5 Irreversible and Irretrievable Commitment of Resources

No irreversible and irretrievable commitment of resources is expected.

6 RECOMMENDED MITIGATION AND MONITORING

BLM requires that decisions be implemented in accordance with the appropriate decision document. Monitoring is needed to ensure that actions taken comply with the terms, conditions, and mitigation measures identified in the decision. BLM would fulfill this responsibility by monitoring the implementation of mitigation measures adopted as conditions of approval to the submitted Operations Plan, Utilization Plan, and Right-of-Way application, as well as the stipulations attached to each of the geothermal leases.

In addition to implementing the special lease stipulations attached to the federal geothermal leases (see Appendix A) and "General Terms and Conditions" to be included in the transmission line and switching station ROW Grants (see Appendix D), NGP has proposed to carry out environmental protection measures:

- Water would be applied to the ground during the construction and utilization of the drill pads, access roads, and other disturbed areas as necessary to control dust.
- Portable chemical sanitary facilities would be available and used by all personnel during periods of well drilling and/or flow testing, and construction. These facilities would be maintained by a local contractor.
- To prevent the spread of invasive, nonnative species, vehicles and equipment would be power washed, including body and undercarriage, prior to entering public lands managed by the BLM.
- Prior to drilling any new temporary water wells, all necessary permits will be obtained from the State Water Engineer at the Division of Water Resources and forwarded to the BLM Winnemucca Field Office.
- All construction and operating equipment would be equipped with applicable exhaust spark arresters. Fire extinguishers would be available on the active sites. Water that is used for construction and dust control would be available for fire fighting. Personnel would be allowed to smoke only in designated areas, and they would be required to follow applicable BLM regulations regarding smoking.
- Cut and fill activities have been minimized through the selection of the power plant site and pipeline routes. Off-site storm water would be intercepted in ditches and channeled to energy dissipaters as necessary to minimize erosion around the power plant. To minimize erosion from storm water runoff, access roads would be maintained consistent with the best management practices for road construction applicable to development roads. BLM best management practices for storm water would be followed, as applicable, on public lands.
- Geothermal fluids would not be discharged to the ground under normal operating conditions. Accidental discharges of geothermal fluids are unlikely because of frequent inspections, ultrasonic testing of the pipeline, flow and pressure monitoring and well pump and pipeline valve shutdown features.
- Following project construction, areas of disturbed land no longer required for operations would be reclaimed to promote the reestablishment of native plant and wildlife habitat.

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Blue Mountain Geothermal Development Project

- Any areas containing cultural resources of significance would be avoided, or the potential for impacts mitigated in a manner acceptable to the BLM Archaeologist. NGP employees, contractors, and suppliers would be reminded that all cultural resources are protected and if uncovered shall be left in place and reported to the NGP representative and/or their supervisor.
- The power plant, pipelines, wellheads, pump motors and motor control buildings would each be painted an appropriate color to blend with the area and minimize visibility. The fence constructed around each of the production well sites and the power plant site would also be painted an appropriate color to blend with the area.
- NGP would comply with any requirements prescribed by the NDEP-BAPC. NGP also proposes to water the ground to control dust during construction.
- Construction noise would be minimized through practices which avoid or minimize actions which may typically generate greater noise levels, or generate distinctive impact noise.
- Construction and operation activities would be conducted in a manner to avoid creating any hazards to public health and safety. The project is remotely located and would not likely cause hazards to public health and safety.

The following recommended mitigation and monitoring measures were developed through the analysis conducted in this EA and are applicable for all submitted applications and plans (ROW, Operations Plan, and Utilization Plan):

- For a period of three years following the commencement of construction, project sites shall be inventoried by the lessee for the presence of invasive, nonnative species. Inventory data shall be reported to the BLM WFO project Lead within one week of receipt by the lessee. The area shall be treated with BLM certified pesticides following BLM approval of a pesticide use proposal if species are present.
- Following the three year period, periodic inventory for the presence of invasive nonnative species would be performed at project sites, with treatment occurring as necessary. The periodic inventory and treatment would occur for as long as the lessee is present at the site.
- All trucks (excluding pick-up trucks) and construction equipment should be washed to remove soil and plant parts. A central washing facility would be provided for this purpose at a location either in Winnemucca or at a facility approved by the authorized officer. The washing station should not be placed within 150 feet of any body of water or ditch line, nor where the wash water can flow downslope.
- Initial ground disturbing activities would not be conducted during the migratory bird nesting season (March through July) unless necessary, and then only after inventories for migratory birds and nests were conducted by a qualified biologist acceptable to the BLM. This survey would be conducted to identify either breeding adult birds or nest sites within the specific areas to be disturbed. If active nests are present within these areas to be disturbed, NGP would coordinate with the authorized officer to develop appropriate protection measures for these sites, which may include avoidance, construction constraints, and/or the establishment of buffers.

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Blue Mountain Geothermal Development Project

- Unoccupied disturbed areas shall be seeded by the applicant as directed by the BLM Winnemucca Field Office using the following native seed mixture and application rate. Any variance in the mix would be coordinated first with the BLM Winnemucca Field Office.

BLM-Recommended Seed Mix:

Species	PLS LBS./Acre	Bulk LBS./Acre	PLS/sq. ft.
Sandberg bluegrass	1.90	2.00	38
Fourwing saltbush	3.00	5.00	4
Shadscale	3.00	5.00	4
Indian ricegrass	1.00	1.25	4
Totals	8.90	13.25	50

PLS = Pure Live Seeds

The following recommended mitigation and monitoring measure was developed through the analysis conducted in this EA and is applicable for proposed project activities associated only with the Operations Plan:

- All drill rig and well test facility lights would be limited to those required to safely conduct the operations, and would be shielded and/or directed in a manner which focuses direct light to the immediate work area.

The following recommended mitigation and monitoring measure was developed through the analysis conducted in this EA and is applicable for proposed project activities associated only with the Utilization Plan:

- Permanent project facilities within the geothermal operations area would be limited to those required to safely conduct the operations, and would be shielded and/or directed in a manner which focuses direct light to the immediate work area.

The following recommended mitigation and monitoring measures were developed through the analysis conducted in this EA and is applicable for proposed project activities associated only with the Operations Plan and Utilization Plan:

- Absorbent pads or sheets would be placed under likely spill sources.
- The hazardous material spill and disposal contingency plan will be submitted to and approved by BLM and made readily available onsite before operations begin.
- The length of time which geothermal fluid, storm water runoff or other liquids are temporarily stored in any reserve pit would be minimized. Use of reserve pits is limited to the active drilling and testing operations. Fluids from flow testing would only be produced in accordance with permits and plans. The larger reserve pit constructed adjacent to well 26A-14 would be treated with bentonite to minimize the infiltration of geothermal fluids into the shallow ground water aquifer. The fluid level in the larger reserve pit would be monitored daily during initial testing to verify the treatment. The results of the monitoring would be reported to the BLM.
- The quality of selected ground water wells would continue to be monitored to determine if the injection of geothermal fluids may be impacting the levels of geothermal fluid

Environmental Assessment
Blue Mountain Geothermal Development Project

components in the produced waters. Ground water wells to be monitored would include some of those within the unit area with high total dissolved solids, as well as other existing or new ground water wells close to the geothermal operations area. Final design and implementation of the ground water quality monitoring program would occur before the commencement of geothermal production and injection operations.

- In the case negative affects (increasing levels of geothermal fluid components) are recorded by the monitoring program, NGP would work with the BLM, NDOM, NDEP and the Nevada State Water Engineer to adjust geothermal fluid production or injection to remove or minimize negative affects to ground water wells or the geothermal resource.
- The depth to ground water in selected ground water wells would continue to be monitored to determine if the shallow ground water production program may be lowering the groundwater table. Ground water wells to be monitored would include existing or new ground water wells both close to and farther away from the geothermal operations area. Final design and implementation of the ground water level monitoring program would occur before the commencement of geothermal production and injection operations.
- NGP would also monitor produced geothermal fluids, and within 30 days of NGP's receipt of produced water analytical laboratory result(s), the BLM would be provided with a copy of the laboratory result(s). A map or written description of the sample collection point(s) would accompany the result(s).
- Permanent project facilities within the geothermal operations area would be painted a color, subject to approval by the authorized officer, which would blend with the landscape. Prior to painting, NGP would contact the Winnemucca Field Office project lead.

The following recommended mitigation and monitoring measures were developed through the analysis conducted in this EA and is applicable for proposed project activities associated only with the Right-of-Way applications:

- Wood crossmembers and braces, or non-reflective metal, if metal is the only choice, would be used.
- Non-reflective wire/cable/conduit would be used for the main transmission lines.
- Butt treated transmission line poles would be used.
- The average spacing of 300-660 feet between transmission line pole structures would be increased to the maximum extent possible where the transmission lines cross the visually sensitive trails/roads.
- The switching station at the south end of the ROW would be painted a color, subject to approval by the authorized officer, which would blend with the landscape. Prior to painting, NGP would contact the Winnemucca Field Office project lead.

7 COORDINATION AND CONSULTATION

7.1 List of Preparers

Bureau of Land Management, Winnemucca Field Office

Delores Cates, Geologist
Clarence Covert, Wildlife Specialist
Craig Drake, Hydrologist
Mark Gingrich, Hazardous Materials Specialist
Gerald Gulley, Outdoor Recreation Planner
Lynn Harrison, Planning and Environmental Coordinator
Jeff Johnson, Fire Resources and Planning Manager
Barbara Kehrberg, Realty Specialist
Rebecca Lange, Geologist and Project Lead
Laura Levy, GIS Specialist
Cameron McQuivey, Wildlife Resources
Angle Messmer, Fire Resources
Derek Messmer, Rangeland Management Specialist/Weed Specialist
Ron Pearson, Rangeland Management Specialist
Jon Sherve, Hydrologist
Jamie Thompson, Public Affairs Officer
Lewis Trout, Realty Specialist
David Valentine, Archaeologist
Mike Zielinski, Soil Scientist

Environmental Management Associates

Dwight L. Carey, D.Env.	Principal — Project Principal; Cultural Resources, Water Quality (Surface and Ground), Water Quantity, and Cumulative Impacts.
Heather T. Altman	Senior Environmental Specialist — Project Manager; Air Quality; Invasive, Nonnative Species; Native American Consultation; Geology and Minerals; Range Resources; Recreation; Fire Resources; Economic Values; Lands and Realty and Cumulative Impacts.
Terry R. Thomas, D.Env.	Principal – Candidate and Special Status Species; Migratory Birds; Threatened and Endangered Species; Wildlife; Visual Resources; Soils, Vegetation and Wastes, Hazardous and Solid.
Shaun P. Evola	Environmental Specialist – Economic Values and Floodplains

7.2 Agencies, Groups, and Individuals Contacted

United States Fish and Wildlife Service, Nevada Fish and Wildlife Office

Robert D. Williams, Field Supervisor

Nevada Natural Heritage Project

Eric S. Miskow, Biologist III/Data Manager

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SRK Consulting
Gary Back, Principal Ecologist

Native-X
Robert Vierra, Archaeologist

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Appendix A: BLM Winnemucca Field Office Geothermal Lease Stipulations

NVN- 77668**BLM WINNEMUCCA FIELD OFFICE**
GEOHERMAL LEASE STIPULATIONS

Noncompetitive areas and all Known Geothermal Resource Areas (KGRA) will be open to geothermal leasing with the following restrictions:

Sage grouse: The following stipulations apply to protect sage grouse and their habitat. Known habitat is defined as those areas where sage grouse have been observed. Potential habitat is an areas where sage grouse may occur. **Known Breeding habitat and Leks:** February through June, but may vary on site specific basis. Avoid all activity within 3.3 km. (2 miles) of known leks during the mating season - March through May, or as determined by Field Office and Wildlife Personnel. No surface occupancy within 3.3 km (2 miles) of known leks at all times. **Nesting Habitat and Brood-rearing habitats:** (April through August per Interim NV Guidelines) and Winter Habitats: (October through March). **Known Habitat:** Avoid all development or exploration activities within 3.3 km (2 miles) or other appropriate distance based on site-specific conditions, of leks, or within 1 km. (0.6 mi.) of known nesting, brood-rearing and winter habitat. **Potential Habitat:** Avoid permanent occupancy of potential habitat.

General Sage Grouse Stipulations: Prior to entry on any lease areas which include known or potential habitat, the lessee (operator) shall contact the appropriate BLM Field Office to discuss any proposed activities.

Controlled Or Limited Surface Use: (avoidance and/or required mitigation measures to be developed) – Are applicable for all leases proposed in areas of crucial deer, antelope, and big horn sheep habitat during migration and critical fawning and kidding areas.

Other Biota: Prior to site development, a survey for invertebrates will be conducted on areas where geothermal surface expressions occur.

Threatened, Endangered or Sensitive Species:

No surface occupancy: No surface occupancy within 1 mile of occupied or identified potential Lahontan Cutthroat Trout (LCT) habitat.

Controlled Or Limited Surface Use: (avoidance and/or mitigation measures to be developed) The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modifications of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act, 16 U.S.C. 1531, as amended, including completion of any required procedure for conference or consultation.

Wild Horse and Burros:

Controlled or Limited Surface Use: (avoidance and/or mitigation measures to be developed.) If wild horse or burro populations are located on sites proposed for development, it may be necessary to avoid or develop mitigation measures to reduce adverse impacts to horses. These measures may include providing alternative water sources for horses of equal quality and quantity.

Migratory Birds: Surface disturbing activities during the migratory bird nesting season (March to July) may be restricted in order to avoid potential violation of the Migratory Bird Act. Appropriate inventories of migratory birds shall be conducted during analysis of actual site development. If active nests are located, the proponent shall coordinate with BLM to establish appropriate protection measures for the nesting sites which may include avoidance or restricting or excluding development during certain areas to times when nests and nesting birds will not be disturbed. During development and production phases, if artificial ponds potentially detrimental to migratory birds are created, these shall be fitted with exclusion devices such as netting or floating balls.

Vegetation

Controlled Or Limited Surface Use: (avoidance and/or mitigation measures to be developed). All areas of exploration and or development disturbance will be reclaimed including re-contouring disturbed areas to blend with the surrounding topography and using appropriate methods to seed with a diverse perennial seed mix. The seed mix used to reclaim disturbed areas would be "certified" weed free.

Riparian Areas: No surface occupancy within 650 feet (horizontal measurement) of any surface water bodies, riparian areas, wetlands, playas or 100-year floodplains to protect the integrity of these resources (as indicated by the presence of riparian vegetation and not actual water). Exceptions to this restriction may be considered on a case-by-case basis if the BLM determines at least one of the following conditions apply: 1) additional development is proposed in an area where current development has shown no adverse impacts, 2) suitable off-site mitigation will be provided if habitat loss is expected, or 3) BLM determines development proposed under any plan of operations ensures adequate protection of the resources.

Noxious Weeds: During all phases of exploration and development, the lessee shall maintain a noxious weed control program consisting of monitoring and eradication for species listed on the Nevada Designated Noxious Weed List (NRS 555.010).

Cultural Resources

No surface occupancy: No surface occupancy within the setting of National Register eligible sites where integrity of setting is critical to their eligibility.

Controlled Or Limited Surface Use: (avoidance and/or mitigation measures to be developed). All surface disturbing activities proposed after issuance of the lease are subject to compliance with Section 106 of the National Historic Protection Act (NHPA) and it's implementation through the protocol between the BLM Nevada State Director and the Nevada State Historic Preservation Officer.

Native American

No surface occupancy: No surface occupancy within the setting of National Register eligible Traditional Cultural Properties (TCPs) where integrity of the setting is critical to their eligibility. For development and production phases, surface occupancy may be limited to a specific distance or precluded at hot springs, pending conclusion of the Native American consultation process.

All development activities proposed under the authority of this lease are subject to the requirement for Native American consultation prior to BLM authorizing the activity. Depending on the nature of the lease developments being proposed and the resources of concerns to tribes potentially effected, Native American consultation and resulting mitigation measures to avoid significant impacts may extend time frames for processing authorizations for development activities, as well as, change in the ways in which developments are implemented.

Paleontological Resources

Where significant paleontological resources are identified, mitigating measures such as data recovery, restrictions on development, and deletion of some areas from development may be required on a case by case basis.

Water Resources

As exploration and development activities commence, the operator shall institute a hydrologic monitoring program. The details of the monitoring programs will be site specific and the intensity shall be commensurate with the level of exploration. For example, if the proponent will be conducting seismic studies the monitoring would be limited to the identification of water resources to be monitored as activities continue; if a drilling program were to be undertaken the number of aquifers encountered, their properties, their quality, and their saturated thickness would be documented. The information collected will be submitted to the Bureau of Land Management and will be used to support future NEPA documentation as development progresses. Adverse impacts to surface expressions of the geothermal reservoir (hot springs), and Threatened and Endangered Species habitat are not acceptable. The lessee will monitor the quality, quantity, and temperature of any hot springs or other water resource within the project area whenever they are conducting activities which have the potential to impact those resources. If adverse impacts do occur, BLM will require the lessee to take corrective action to mitigate the impact. Corrective action may include shutting down the operation. These are in addition to the other stipulations. These are LEASE stipulations, not operational, the information gathered under the monitoring stipulation will be used to identify future impacts at the operational stage.

Lands & Realty

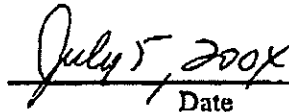
No drilling, including exploration or development activities within linear Rights-of-Way

Hazardous Materials

Prior to exploration and development, an emergency response plan will be developed to include contingencies for hazardous material spills and disposal.



Signature of Lessee



Date

Serial Number N-77668

BLM WINNEMUCCA FIELD OFFICE
GEOHERMAL LEASE STIPULATION
FOR SPECIAL STATUS SPECIES

The Nevada oryctes (*Oryctes nevadensis*), a special status plant species (T&E Sensitive) was identified in section 8, in the same township of the lands contained in this lease. The lease lands contain similar habitat and associated plant species. Prior to approval of ground disturbing activities BLM will require a field inventory to determine the presence of this species.



Signature of Lessee, Agent, or Attorney in Fact

July 5, 2004
Date

Serial Number N-77668

BLM WINNEMUCCA FIELD OFFICE
GEOHERMAL LEASE STIPULATION
FOR GUZZLERS

A Nevada Department of Wildlife guzzler is located on the lands within sec.12, T. 34 N., R 36 E., MDM, Nevada. On a case-by-case basis, BLM Winnemucca Field Office will require that a "buffer" be maintained around the guzzler during the months of June through October to insure that wildlife will not be prevented access to the site.



Signature of Lessee, Agent, or Attorney in Fact

July 5 2004
Date

BLM WINNEMUCCA FIELD OFFICE
GEOHERMAL LEASE STIPULATIONS

Noncompetitive areas and all Known Geothermal Resource Areas (KGRA) will be open to geothermal leasing with the following restrictions:

Sage grouse: The following stipulations apply to protect sage grouse and their habitat. Known habitat is defined as those areas where sage grouse have been observed. Potential habitat is an areas where sage grouse may occur. **Known Breeding habitat and Leks:** February through June, but may vary on site specific basis. Avoid all activity within 3.3 km. (2 miles) of known leks during the mating season - March through May, or as determined by Field Office and Wildlife Personnel. No surface occupancy within 3.3 km (2 miles) of known leks at all times. **Nesting Habitat and Brood-rearing habitats:** (April through August per Interim NV Guidelines) and Winter Habitats: (October through March). **Known Habitat:** Avoid all development or exploration activities within 3.3 km (2 miles) or other appropriate distance based on site-specific conditions, of leks, or within 1 km. (0.6 mi.) of known nesting, brood-rearing and winter habitat. **Potential Habitat:** Avoid permanent occupancy of potential habitat.

General Sage Grouse Stipulations: Prior to entry on any lease areas which include known or potential habitat, the lessee (operator) shall contact the appropriate BLM Field Office to discuss any proposed activities.

Controlled Or Limited Surface Use: (avoidance and/or required mitigation measures to be developed) – Are applicable for all leases proposed in areas of crucial deer, antelope, and big horn sheep habitat during migration and critical fawning and kidding areas.

Other Biota: Prior to site development, a survey for invertebrates will be conducted on areas where geothermal surface expressions occur.

Threatened, Endangered or Sensitive Species:

No surface occupancy: No surface occupancy within 1 mile of occupied or identified potential Lahontan Cutthroat Trout (LCT) habitat.

Controlled Or Limited Surface Use: (avoidance and/or mitigation measures to be developed) The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modifications of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act, 16 U.S.C. 1531, as amended, including completion of any required procedure for conference or consultation.

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1

NEVADA STATE OFFICE
RENO, NEVADA

Wild Horse and Burros.

Controlled or Limited Surface Use: (avoidance and/or mitigation measures to be developed.) If wild horse or burro populations are located on sites proposed for development, it may be necessary to avoid or develop mitigation measures to reduce adverse impacts to horses. These measures may include providing alternative water sources for horses of equal quality and quantity.

Migratory Birds: Surface disturbing activities during the migratory bird nesting season (March to July) may be restricted in order to avoid potential violation of the Migratory Bird Act. Appropriate inventories of migratory birds shall be conducted during analysis of actual site development. If active nests are located, the proponent shall coordinate with BLM to establish appropriate protection measures for the nesting sites which may include avoidance or restricting or excluding development during certain areas to times when nests and nesting birds will not be disturbed. During development and production phases, if artificial ponds potentially detrimental to migratory birds are created, these shall be fitted with exclusion devices such as netting or floating balls.

Vegetation

Controlled Or Limited Surface Use: (avoidance and/or mitigation measures to be developed). All areas of exploration and or development disturbance will be reclaimed including re-contouring disturbed areas to blend with the surrounding topography and using appropriate methods to seed with a diverse perennial seed mix. The seed mix used to reclaim disturbed areas would be "certified" weed free.

Riparian Areas: No surface occupancy within 650 feet (horizontal measurement) of any surface water bodies, riparian areas, wetlands, playas or 100-year floodplains to protect the integrity of these resources (as indicated by the presence of riparian vegetation and not actual water). Exceptions to this restriction may be considered on a case-by-case basis if the BLM determines at least one of the following conditions apply: 1) additional development is proposed in an area where current development has shown no adverse impacts, 2) suitable off-site mitigation will be provided if habitat loss is expected, or 3) BLM determines development proposed under any plan of operations ensures adequate protection of the resources.

Noxious Weeds: During all phases of exploration and development, the lessee shall maintain a noxious weed control program consisting of monitoring and eradication for species listed on the Nevada Designated Noxious Weed List (NRS 555.010).

Cultural Resources

No surface occupancy: No surface occupancy within the setting of National Register eligible sites where integrity of setting is critical to their eligibility.

Controlled Or Limited Surface Use: (avoidance and/or mitigation measures to be developed). All surface disturbing activities proposed after issuance of the lease are subject to compliance with Section 106 of the National Historic Protection Act (NHPA) and it's implementation through the protocol between the BLM Nevada State Director and the Nevada State Historic Preservation Officer.

Native American

No surface occupancy: No surface occupancy within the setting of National Register eligible Traditional Cultural Properties (TCPs) where integrity of the setting is critical to their eligibility. For development and production phases, surface occupancy may be limited to a specific distance or precluded at hot springs, pending conclusion of the Native American consultation process.

All development activities proposed under the authority of this lease are subject to the requirement for Native American consultation prior to BLM authorizing the activity. Depending on the nature of the lease developments being proposed and the resources of concerns to tribes potentially effected, Native American consultation and resulting mitigation measures to avoid significant impacts may extend time frames for processing authorizations for development activities, as well as, change in the ways in which developments are implemented.

Paleontological Resources

Where significant paleontological resources are identified, mitigating measures such as data recovery, restrictions on development, and deletion of some areas from development may be required on a case by case basis.

Water Resources

As exploration and development activities commence, the operator shall institute a hydrologic monitoring program. The details of the monitoring programs will be site specific and the intensity shall be commensurate with the level of exploration. For example, if the proponent will be conducting seismic studies the monitoring would be limited to the identification of water resources to be monitored as activities continue; if a drilling program were to be undertaken the number of aquifers encountered, their properties, their quality, and their saturated thickness would be documented. The information collected will be submitted to the Bureau of Land Management and will be used to support future NEPA documentation as development progresses. Adverse impacts to surface expressions of the geothermal reservoir (hot springs), and Threatened and Endangered Species habitat are not acceptable. The lessee will monitor the quality, quantity, and temperature of any hot springs or other water resource within the project area whenever they are conducting activities which have the potential to impact those resources. If adverse impacts do occur, BLM will require the lessee to take corrective action to mitigate the impact. Corrective action may include shutting down the operation. These are in addition to the other stipulations. These are LEASE stipulations, not operational, the information gathered under the monitoring stipulation will be used to identify future impacts at the operational stage.

Lands & Realty

No drilling, including exploration or development activities within linear Rights-of-Way

Hazardous Materials

Prior to exploration and development, an emergency response plan will be developed to include contingencies for hazardous material spills and disposal.



Signature of Lessee



Date

NVN-80159

BLM WINNEMUCCA FIELD OFFICE
GEOHERMAL LEASE STIPULATION
FOR SPECIAL STATUS SPECIES

Orcytes (*Orcytes nevadensis*), a sensitive species, has been identified in the area of this lease. Prior to approval of any ground disturbing activities BLM will require a field inventory to determine the presence of this species. If the species are present in the inventory area, BLM will require avoidance and/or mitigation measures.



Signature of Lessee

July 26, 2006
Date

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RENO, NEVADA

Lessee shall take reasonable measures deemed heirs, executors, administrators, successors, or necessary by assigns of the respective parties hereto.

(Form 3200-24, page 2)

NVN- 80086

BLM WINNEMUCCA FIELD OFFICE
GEOTHERMAL LEASE STIPULATIONS

Noncompetitive areas and all Known Geothermal Resource Areas (KGRA) will be open to geothermal leasing with the following restrictions:

Sage grouse: The following stipulations apply to protect sage grouse and their habitat. Known habitat is defined as those areas where sage grouse have been observed. Potential habitat is an areas where sage grouse may occur.

Known Breeding habitat and Leks: February through June, but may vary on site specific basis. Avoid all activity within 3.3 km. (2 miles) of known leks during the mating season - March through May, or as determined by Field Office and Wildlife Personnel. No surface occupancy within 3.3 km (2 miles) of known leks at all times. **Nesting Habitat and Brood-rearing habitats:** (April through August per Interim NV Guidelines) and Winter Habitats: (October through March). **Known Habitat:** Avoid all development or exploration activities within 3.3 km (2 miles) or other appropriate distance based on site-specific conditions, of leks, or within 1 km. (0.6 mi.) of known nesting, brood-rearing and winter habitat. **Potential Habitat:** Avoid permanent occupancy of potential habitat.

General Sage Grouse Stipulations: Prior to entry on any lease areas which include known or potential habitat, the lessee (operator) shall contact the appropriate BLM Field Office to discuss any proposed activities.

Controlled Or Limited Surface Use: (avoidance and/or required mitigation measures to be developed) Are applicable for all leases proposed in areas of crucial deer, antelope, and big horn sheep habitat during migration and critical fawning and kidding areas.

Other Biota: Prior to site development, a survey for invertebrates will be conducted on areas where geothermal surface expressions occur.

Threatened, Endangered or Sensitive Species:

No surface occupancy: No surface occupancy within 1 mile of occupied or identified potential Lahontan Cutthroat Trout (LCT) habitat.

Controlled Or Limited Surface Use: (avoidance and/or mitigation measures to be developed) The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modifications of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act, 16 U.S.C. 1531, as amended, including completion of any required procedure for conference or consultation.

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RENO, NEVADA

Wild Horse and Burros.

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Lands & Realty

No drilling, including exploration or development activities within linear Rights-of-Way

Hazardous Materials

Prior to exploration and development, an emergency response plan will be developed to include contingencies for hazardous material spills and disposal.

/s/ Brian D. Fairbank

Signature of Lessee

July 26, 2006

Date

BLM WINNEMUCCA FIELD OFFICE
GEOTHERMAL LEASE STIPULATION
FOR SPECIAL STATUS SPECIES

Orcytes (*Orcytes nevadensis*), a sensitive species, has been identified in the area of this lease. Prior to approval of any ground disturbing activities BLM will require a field inventory to determine the presence of this species. If the species are present in the inventory area, BLM will require avoidance and/or mitigation measures.

/s/ Brian D. Fairbank
Signature of Lessee

July 26, 2006
Date

Appendix B: Proposed Action and Alternative 1 Transmission Line Photosimulations

- Photo 1: Proposed Action transmission line alignment crossing the California Emigrant Trail (before)
- Photo 2: Proposed Action transmission line alignment crossing the California Emigrant Trail (after)
- Photo 3: Alternative 1 transmission line alignment crossing the California Emigrant Trail (before)
- Photo 4: Alternative 1 transmission line alignment crossing the California Emigrant Trail (after)
- Photo 5: Alternative 1 transmission line alignment crossing the Idaho Stage Road (before)
- Photo 6: Alternative 1 transmission line alignment crossing the Idaho Stage Road (after)
- Photo 7: Alternative 1 transmission line alignment crossing the California Emigrant Trail from the north (before)
- Photo 8: Alternative 1 transmission line alignment crossing the California Emigrant Trail from the north (after)

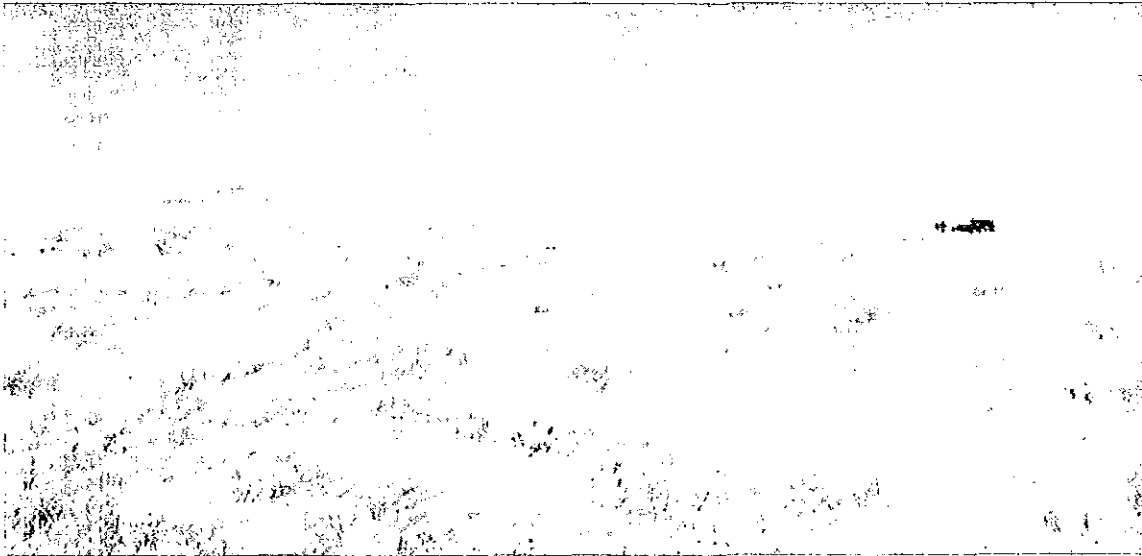


Photo 1: Proposed Action Crossing California Emigrant Trail (Before)

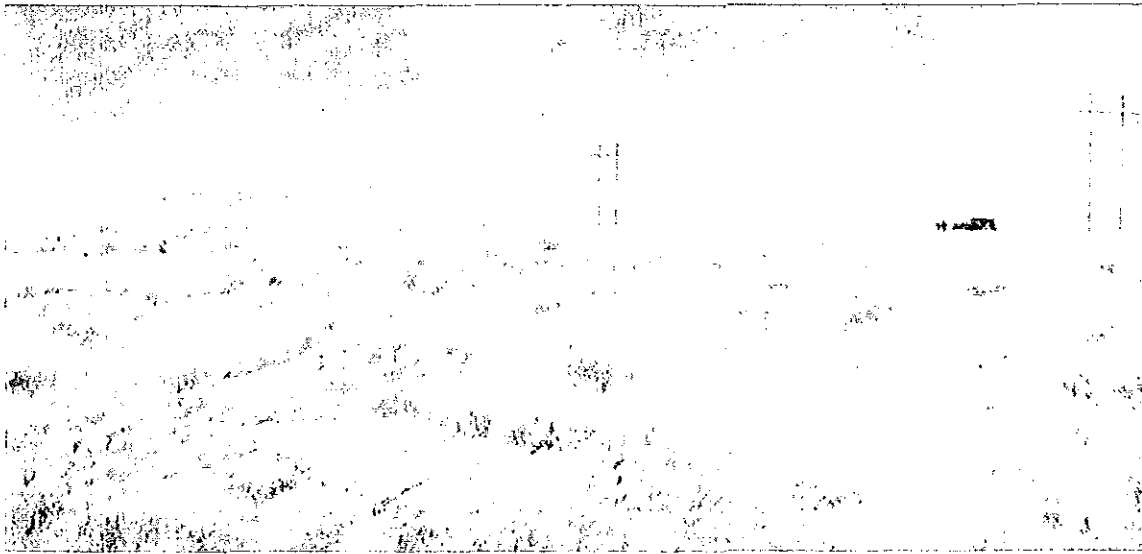


Photo 2: Proposed Action Crossing California Emigrant Trail (After)

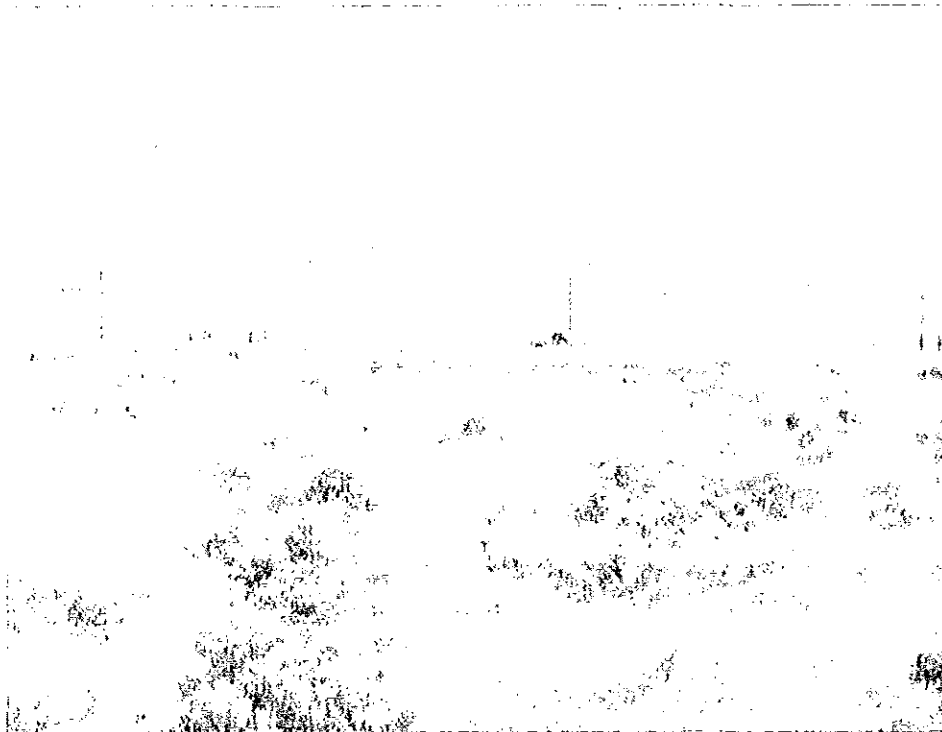


Photo 3: Alternative 1 Crossing of California Emigrant Trail (Before)

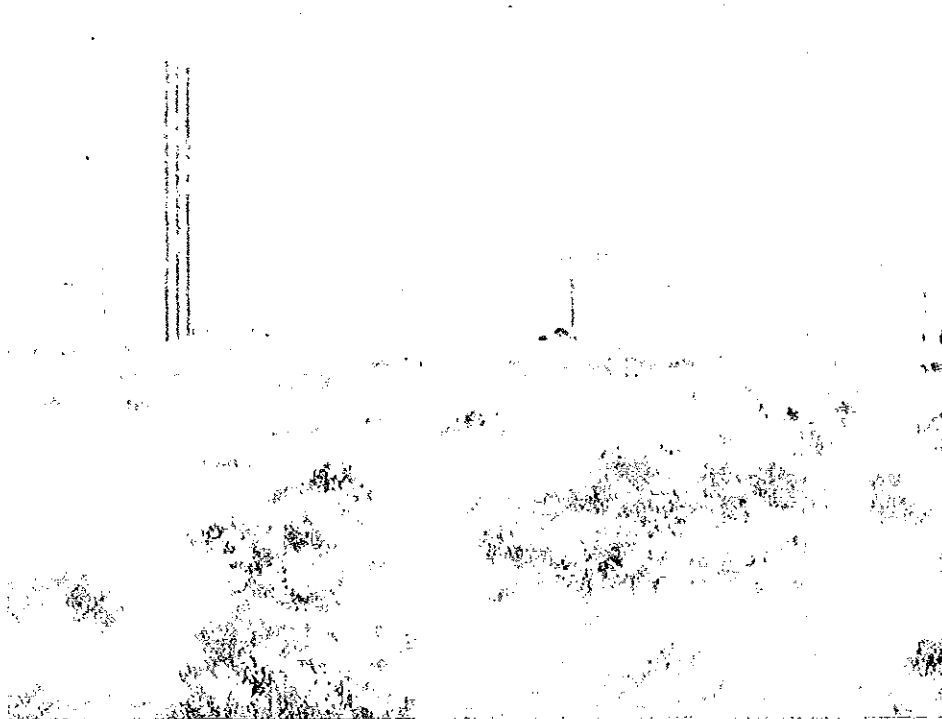


Photo 4: Alternative 1 Crossing of California Emigrant Trail (After)



Photo 5: Alternative 1 Crossing Idaho Stage Road (Before)



Photo 6: Alternative 1 Crossing Idaho Stage Road (After)

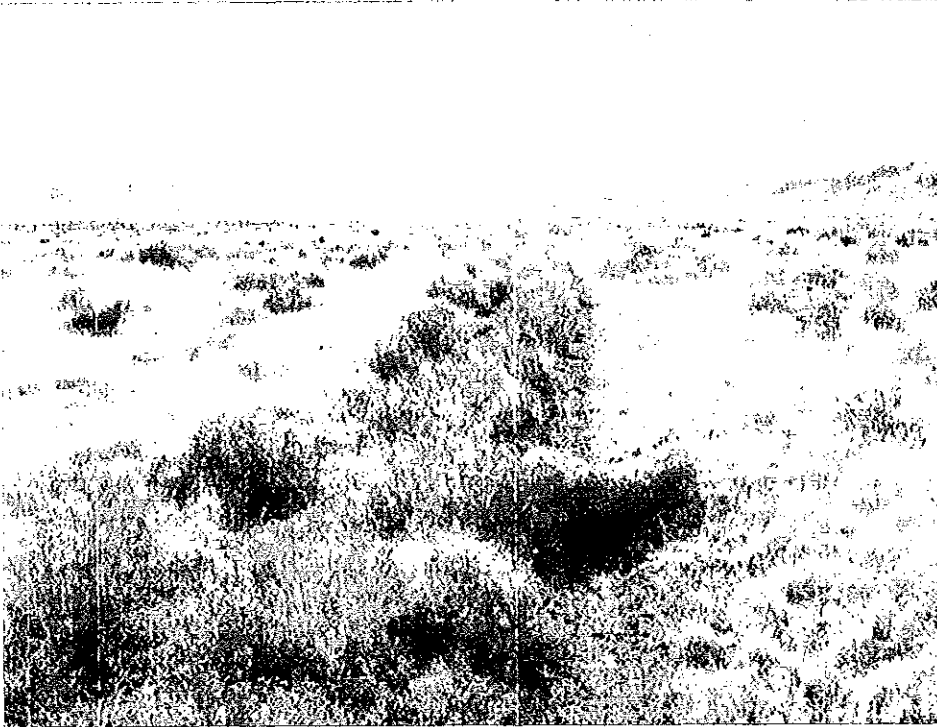


Photo 7: Alternative 1 transmission line alignment crossing the California Emigrant Trail from the north (before)



Photo 8: Alternative 1 transmission line alignment crossing the California Emigrant Trail from the north (after)

Appendix C: Maps and Diagrams

Figure 2: Blue Mountain Geothermal Project Overview Map

Figure 3: Unit Agreement Area N-82457X

Figure 4: Blue Mountain Geothermal Project Area

Figure 5: Transmission Line Alignments Alternatives Considered and Eliminated

Figure 6: California Emigrant Trail

Figure 7: Typical Well Pad Layout

Figure 8: Typical Geothermal Well Completion Profile

Figure 9: Typical H-Frame Tangent with Double Channel Arm and Static Wire

Figure 10: Cumulative Impacts Assessment Area

Figure 11: Recommended Construction Standards for Enclosure Fences in Livestock Areas

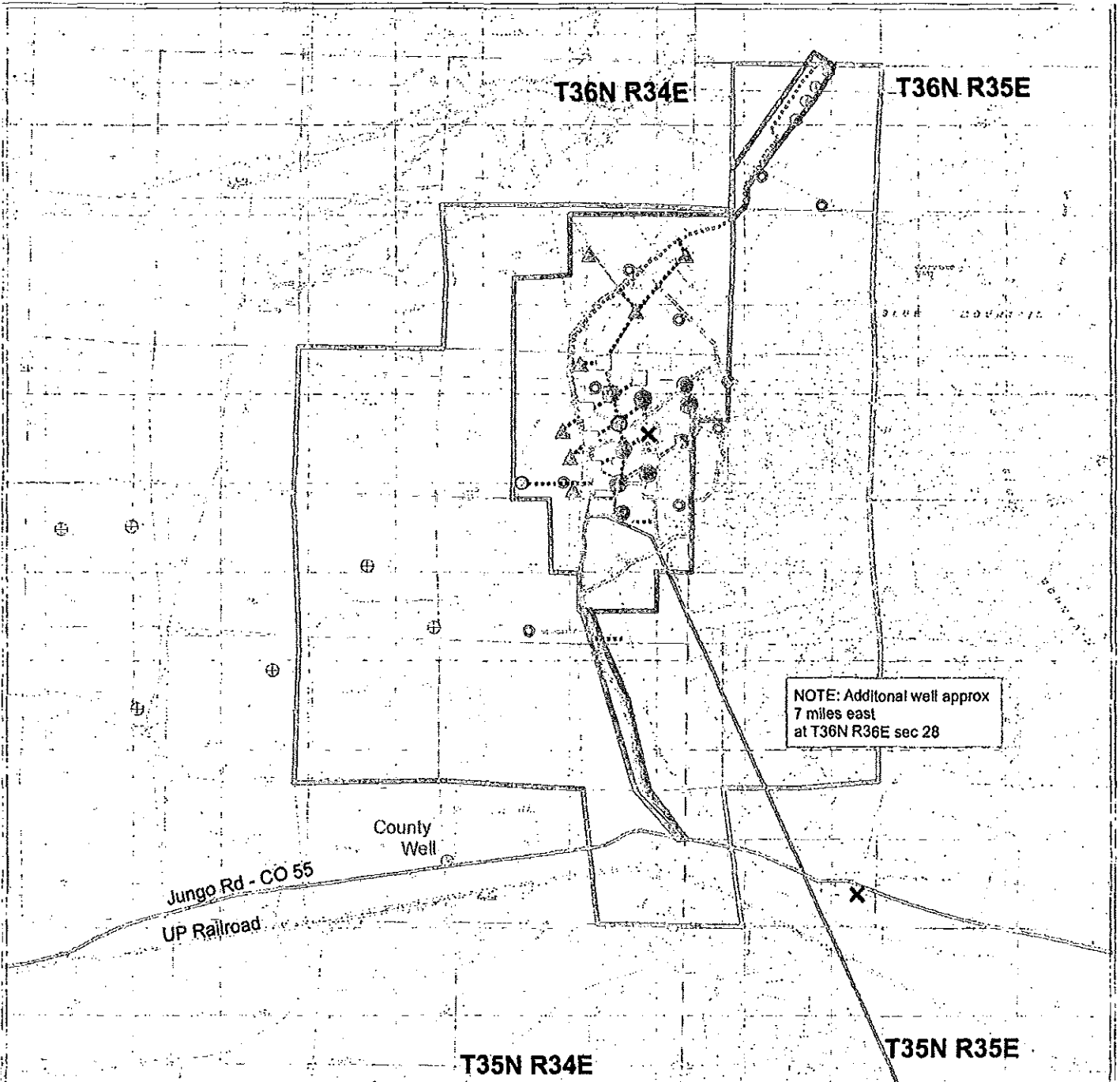
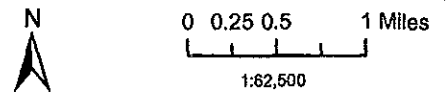


Figure 2: Blue Mountain Geothermal Project Overview Map

Project data from NGP - July 2007



- | | |
|-------------------------------------|--|
| ○ Existing Thermal Gradient Well | □ Geothermal Unit Agreement Boundary |
| ⊕ Currently Approved Well | □ Proposed Geothermal Operations Area (Well field and Power Plant) |
| ==== Currently Approved Access Road | × Aggregate Sites (2) |
| ⌋ Proposed Production Well | — Proposed Transmission Line Corridor |
| — Production Pipeline | ⊙ Water Well (7) |
| ▲ Proposed Injection Well | ⋯ Fresh Water Line |
| — Injection Pipeline | ⊕ Selected Ground Water Well |
| ⋯ Proposed Access Road | |
| ⊙ T-Line Staging Area | |

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No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

- | |
|-----------|
| □ BLM |
| □ Private |



Map Date: Nov 1, 2007

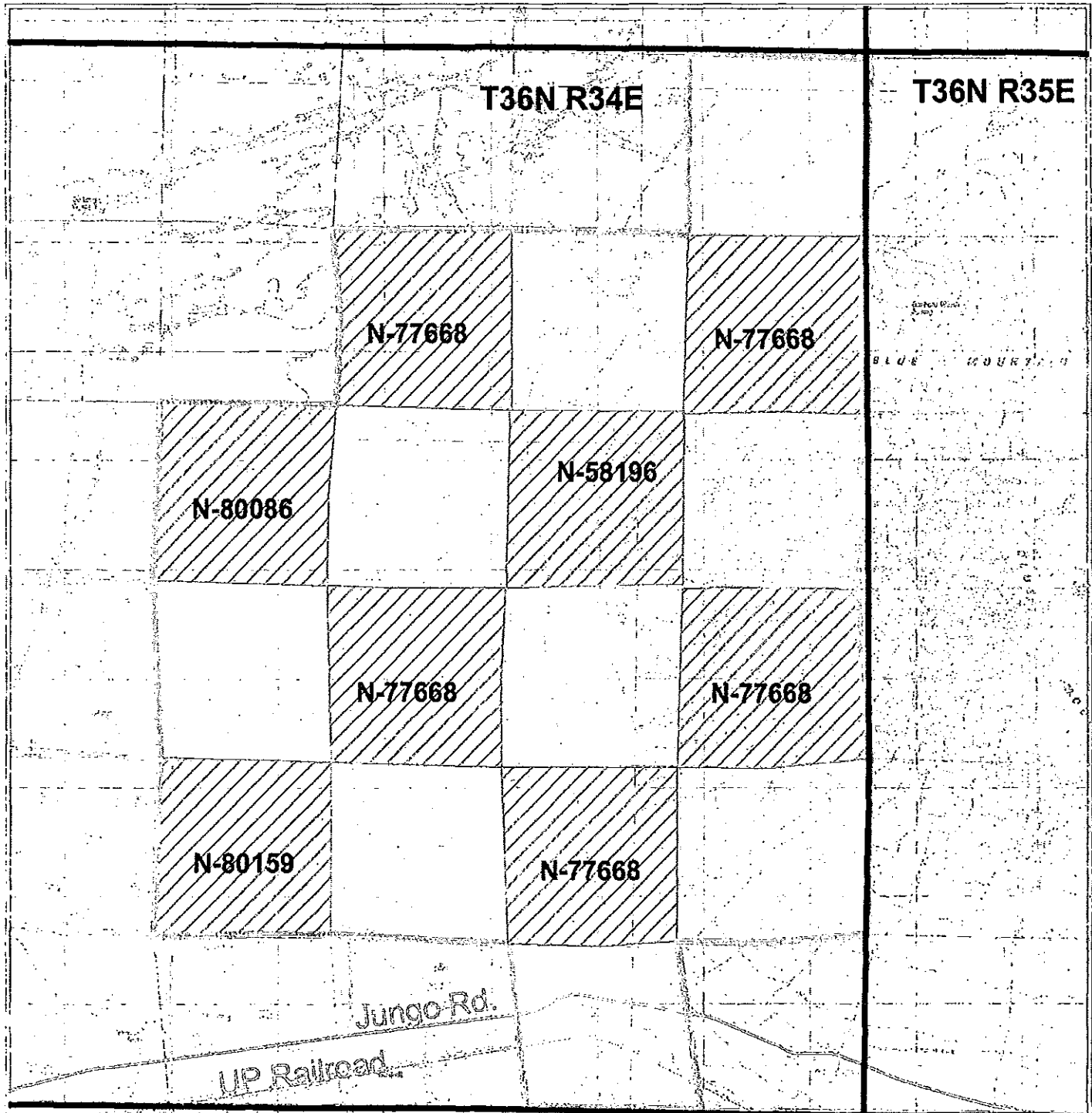




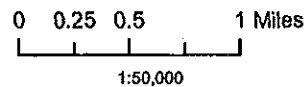


Figure 3: Unit Agreement Area N-82457X

-  Geothermal Unit Agreement Boundary
-  Federal Lease N-xxxxx

10,994.62 Acres Total

-  BLM - 5,262.34 Acres
-  Private - 5,732.28 Acres



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Map Date: Aug 16, 2007

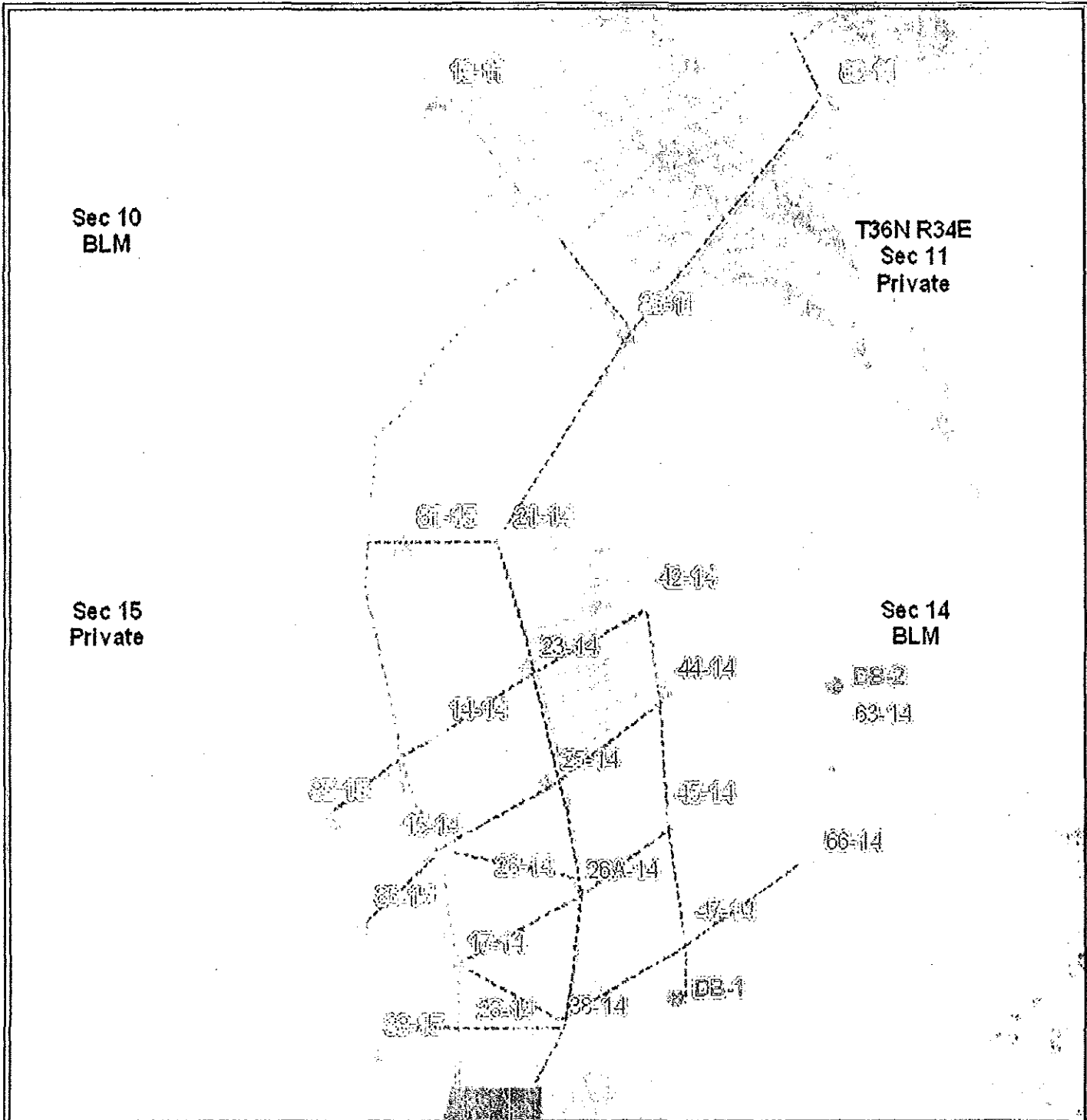
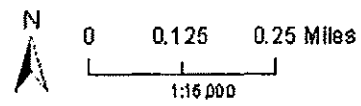


Figure 4: Blue Mountain Geothermal Project Area

Project data from NGP - July 2007
 Background image - July 2006



- ⊙ Currently Approved Well
- └ Proposed Production Well
- Production Pipeline
- ▲ Proposed Injection Well
- Injection Well Pipeline
- Fresh Water Line
- Access Road
- Proposed Power Plant

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Map Date: Nov 1, 2007

Pershing County

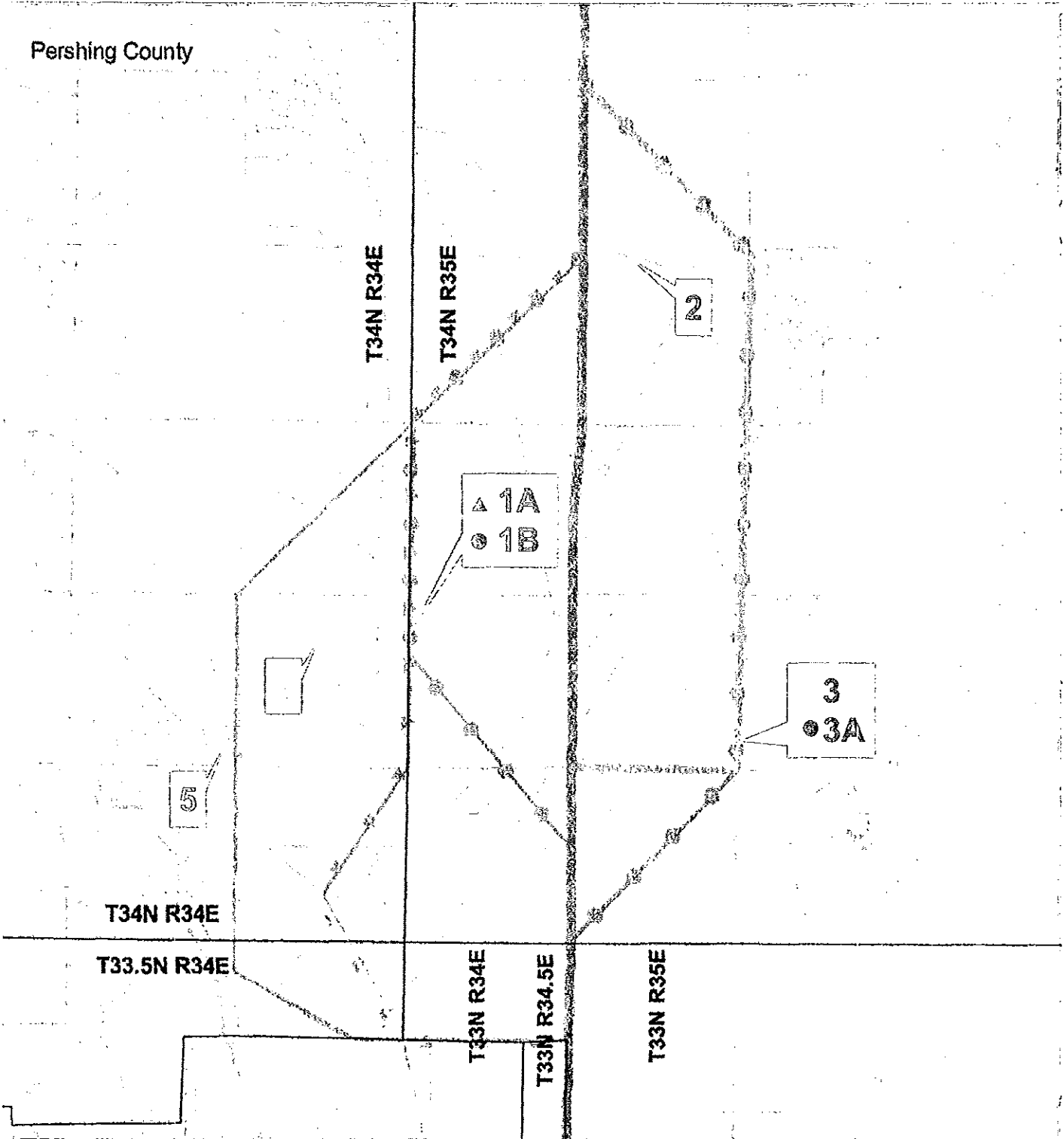
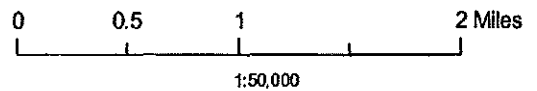


Figure 5: Transmission Line Alignments Alternatives Considered and Eliminated

Project data from NGP - July 2007

- | | | |
|----|----|------------------|
| 1A | 3A | Proposed T- Line |
| 1B | 4 | BLM |
| 2 | 5 | Private |
| 3 | | |



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Map Date: Aug 16, 2007

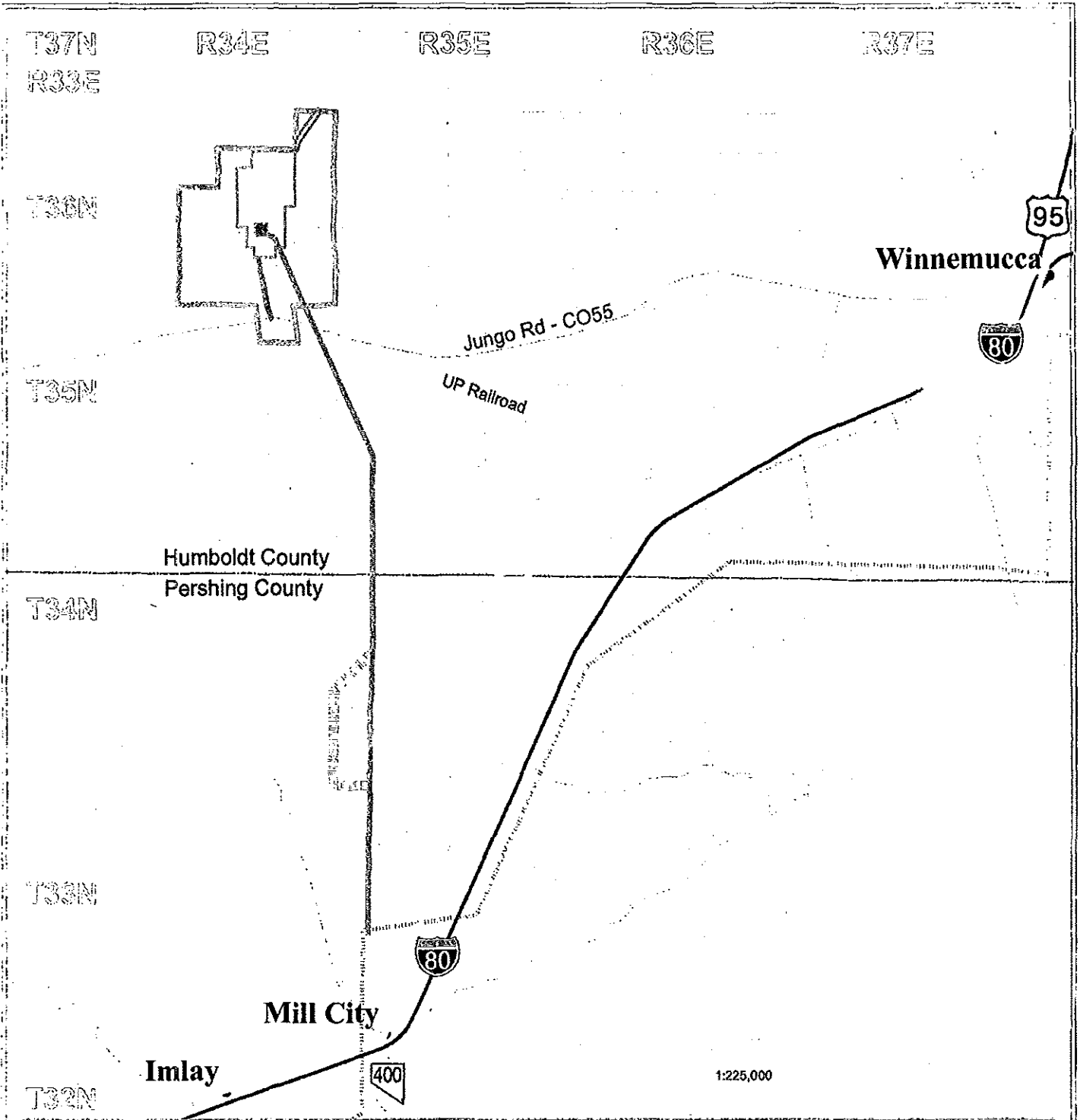
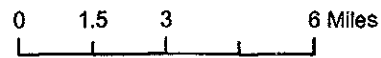


Figure 6: California Emigrant Trail

Project data from NGP - July 2007



1:225,000

- | | |
|---|---------------------|
| California Trail | Unit Agreement Area |
| Transmission Line Corridor | BLM |
| Alternate T-Line Route | Private |
| Existing Power Line | Water |
| Proposed Geothermal Operations Area (with Power Plant site shown) | |



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 Winnemucca, NV 89445

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Map Date: Oct 24, 2007

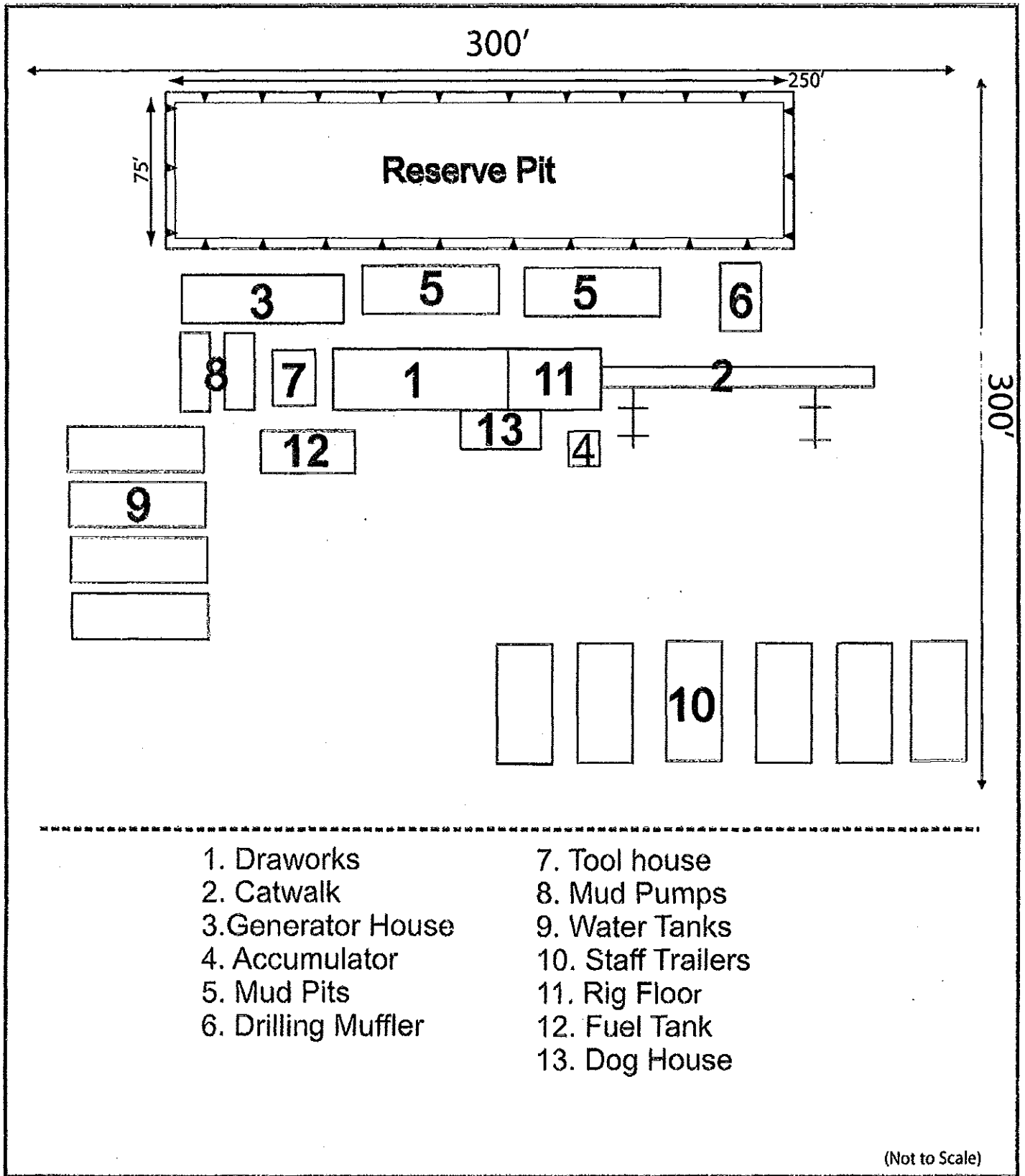
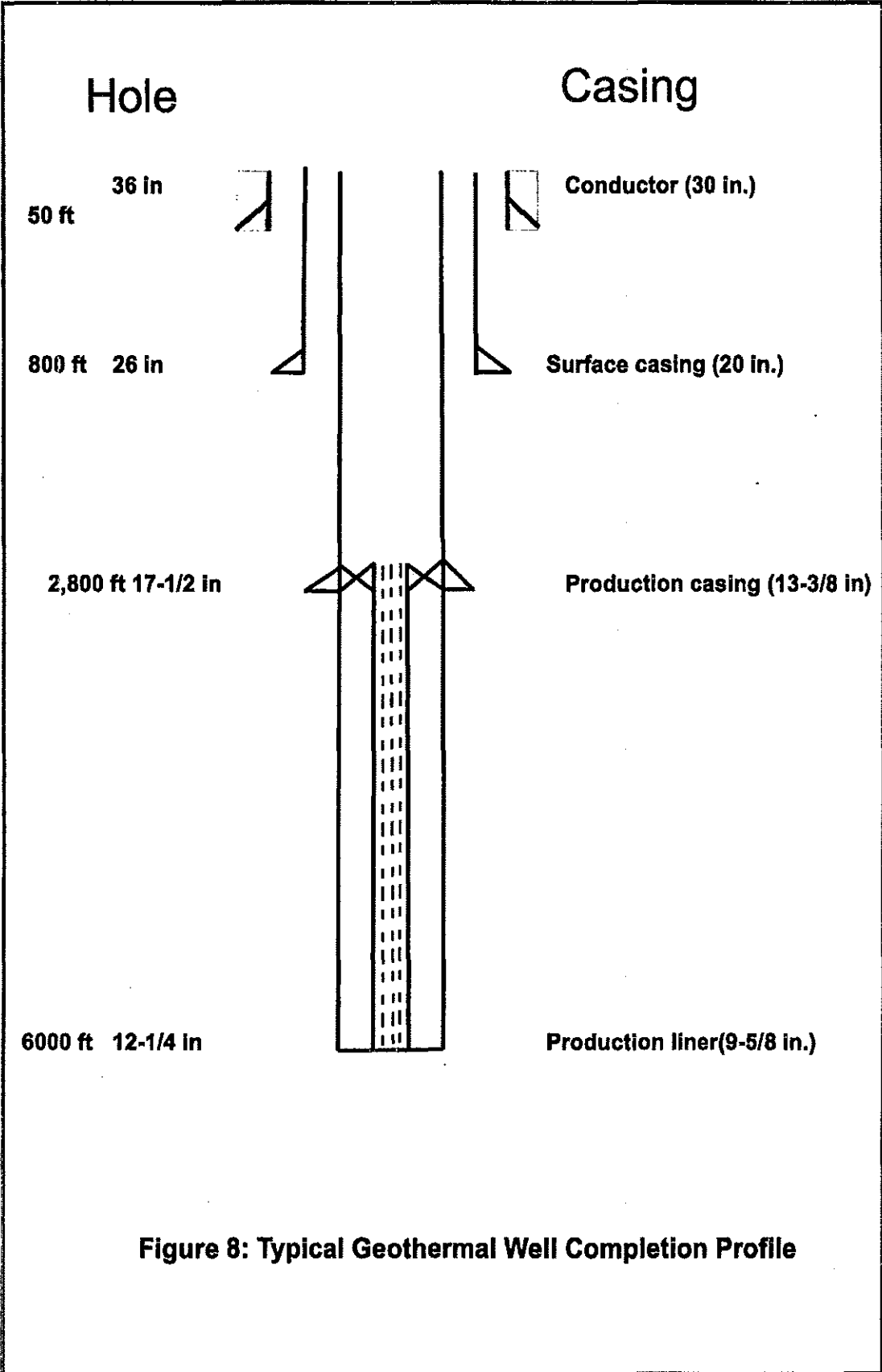


Figure 7: Typical Well Pad Layout



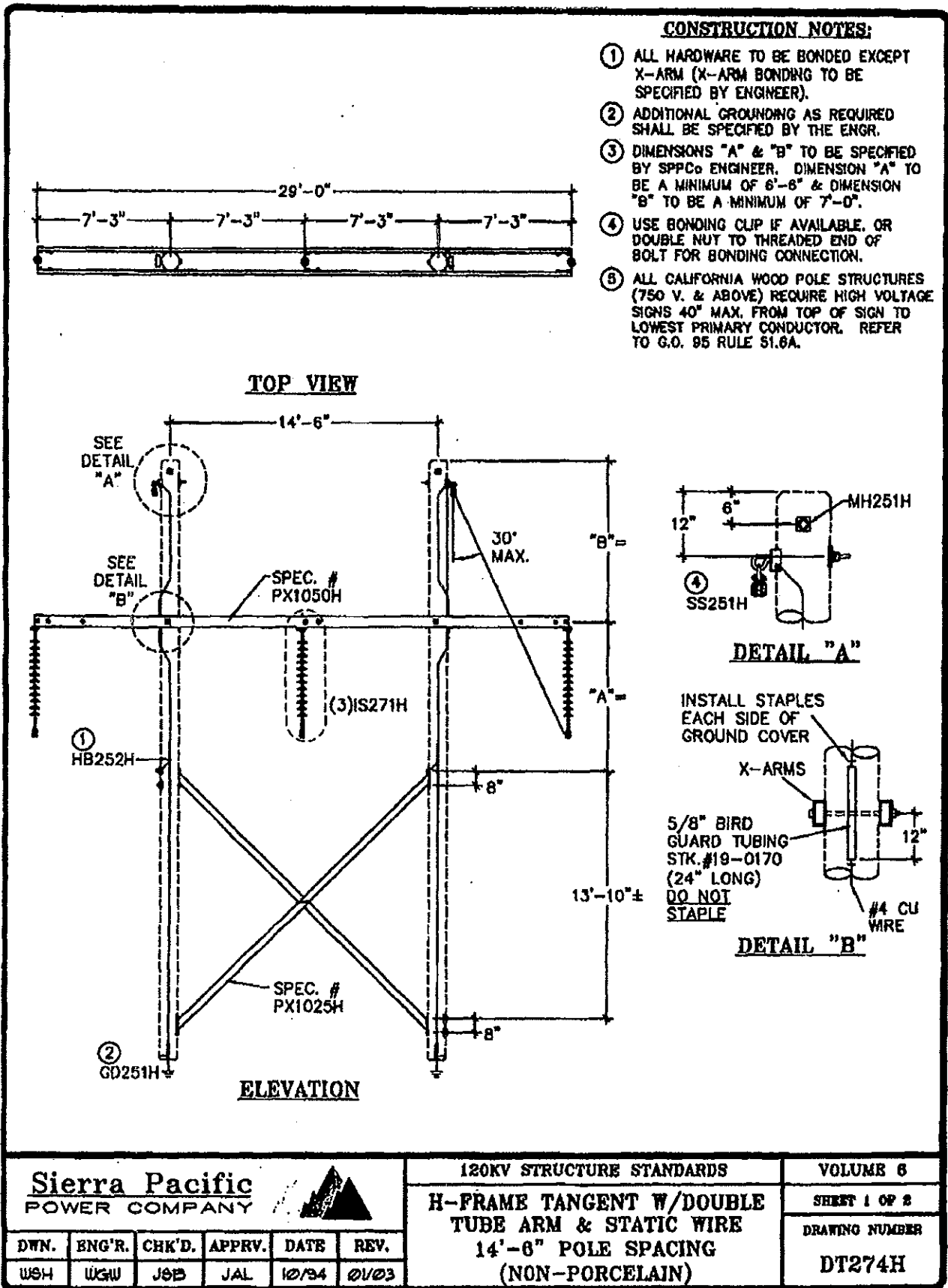


Figure 9: Typical H-Frame Tangent with Double Channel Arm and Static Wire

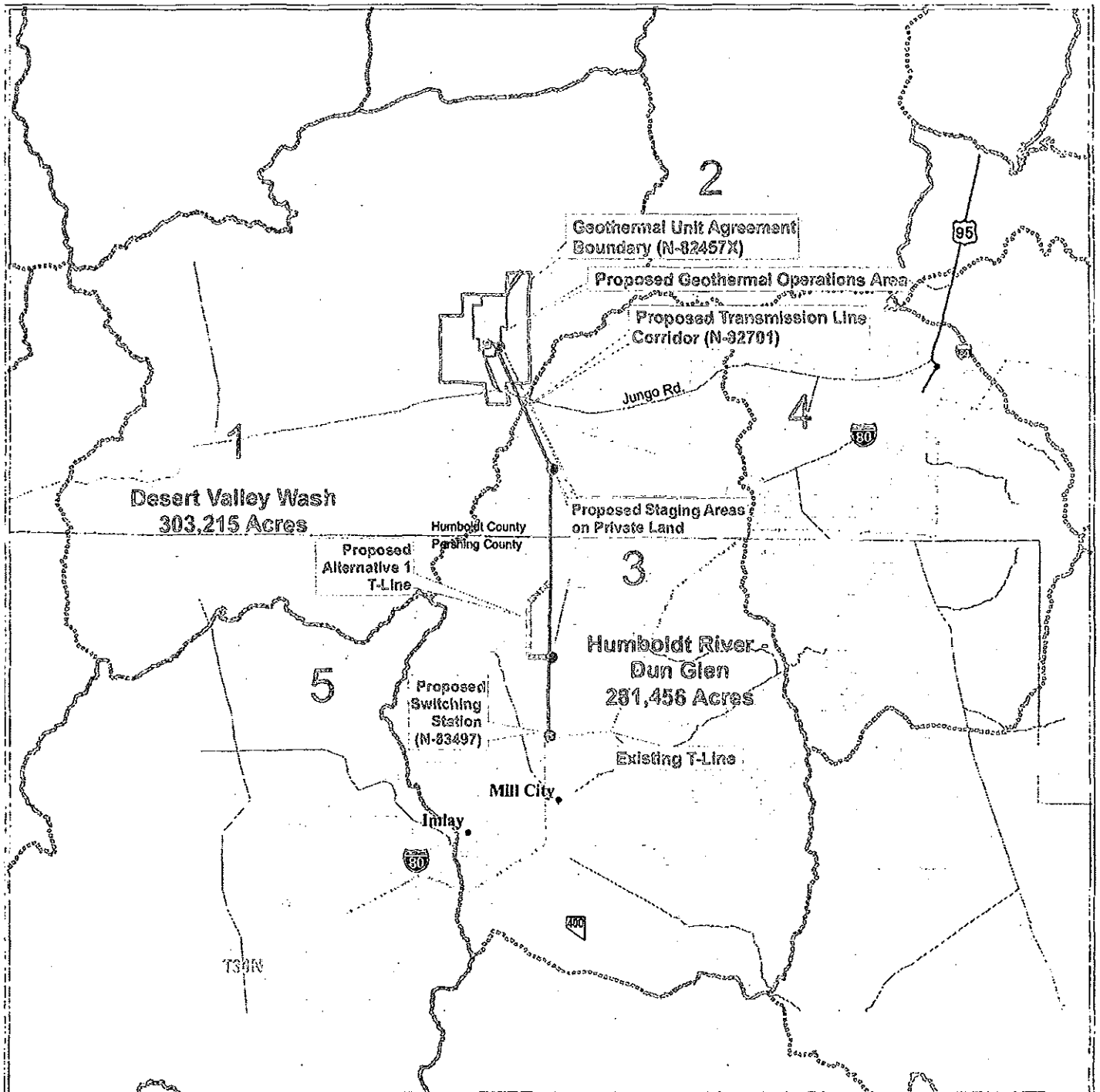


Figure 10: Cumulative Impacts Assessment Area

Project data from NGP - July 2007



0 1.5 3 6 Miles

1:400,000



Watershed Boundary

- 1 - Desert Valley Wash
- 2 - Upper Silver State Valley Wash
- 3 - Humboldt River / Dun Glen
- 4 - Humboldt River / Clear Creek
- 5 - Rye Patch Reservoir



Transmission Line Corridor



Existing Power Line



Geothermal Unit Agreement Boundary



Proposed Geothermal Operations Area

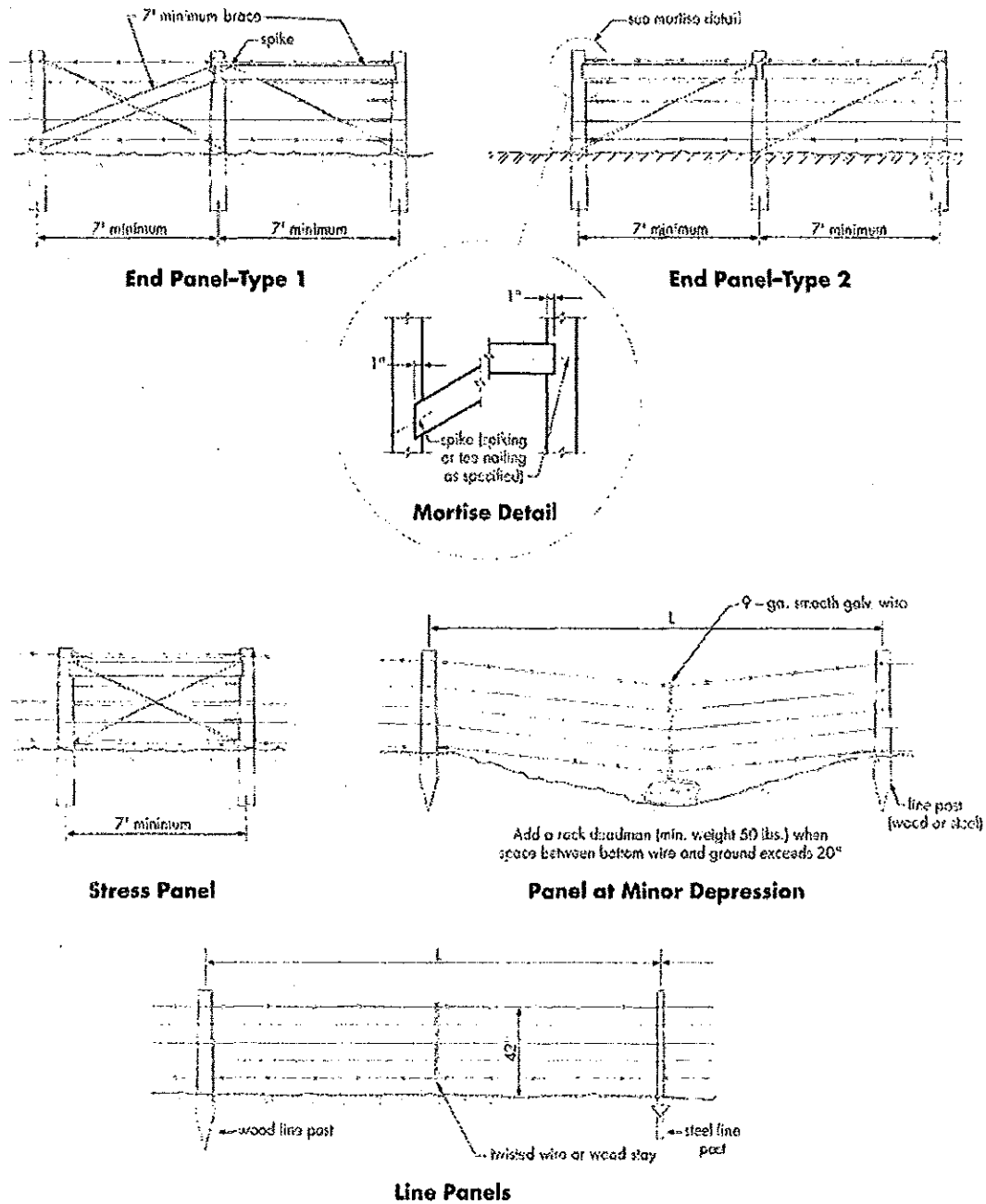
BLM

Private



Map Date: Oct 24, 2007

Figure 11: Recommended Construction Standards for Enclosure Fences in Livestock Areas



Appendix D: Right-of-Way General Terms and Conditions

EXHIBIT A

RIGHT-OF-WAY N-82701

December __, 2007

GENERAL TERMS AND CONDITIONS

(Continued from Form 2800-14)

1. In case of change of address, the Holder shall immediately notify the Bureau of Land Management (BLM) Authorized Officer (Authorized Officer).
2. This grant is subject to all valid rights existing on the effective date of this right-of-way (R/W) grant.
3. The Holder shall comply with applicable federal, state, county, and municipal laws, regulations, and standards, including but not limited to, those for public health and safety, environmental protection, locating, construction, operation, and maintenance, existing or hereafter promulgated, in exercising the rights granted by this R/W.
4. The federal regulations incorporated in 43 CFR 2800 are inclusive within these stipulations.
5. The R/W is not for the exclusive use of the Holder. All existing and future Holders shall be responsible for maintenance, and determining the maintenance and respective responsibilities. Upon request, the Authorized Officer shall be provided with copies of any maintenance agreement entered into.
6. The Holder shall permit free and unrestricted public access to and upon the R/W for all lawful purposes, except for any specific areas designated as restricted by the Authorized Officer to protect the public, wildlife, livestock, or facilities constructed within the R/W.
7. The Holder shall inform the Authorized Officer within 48 hours of any accidents on federal lands that require reporting to the Department of Transportation as required by 49 CFR Part 195.
8. Fences, signs, or other structures, which could be interpreted to represent a third-party, private use, shall not be installed or remain on or within the R/W.
9. The Holder is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites or for collecting artifacts.
10. Pursuant to 43 CFR 10.4(g), the Holder of this authorization must notify the Authorized Officer, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined at 43 CFR 10.2). Further, pursuant to 43 CFR 10.4(c) and (d), the Holder must stop activities in the immediate vicinity of the discovery and protect it from all activities until notified to proceed by the Authorized Officer.

11. Any cultural and/or paleontological resource (historic or prehistoric site or object) or Native American human remains, funerary item, sacred object, or objects of cultural patrimony, discovered by the Holder, or any person working on their behalf, during the course of activities on public land, shall be immediately reported to the Authorized Officer by telephone, with written confirmation. The Holder shall suspend all operations in the immediate area of such discovery and protect it until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant values. The Holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the Holder.
12. It is the Holder's responsibility to determine and to acquire all federal, state, county, and municipal permits and authorizations as required.
13. The Holder shall conduct all activities associated with the construction, operation, maintenance, and termination of the R/W within the authorized limits of the R/W.
14. All improvements, operation, maintenance, design, material, and termination practices shall be in accordance with safe and proven engineering practices and subject to the approval of the Authorized Officer.
15. Construction related traffic shall be restricted to routes approved by the Authorized Officer. New access roads or cross-country vehicle travel will not be permitted unless prior written approval is given by the Authorized Officer.
16. The Holder shall prevent any activities which may cause erosion. Where erosion has resulted, the Holder shall re-vegetate and re-habilitate the location. The Holder is responsible for consultation with the Authorized Officer regarding acceptable methods and procedures. Any transmission line access, construction, and/or maintenance road(s) shall be winterized by providing a well drained roadway using waterbarring, maintaining drainage, and additional measures to minimize erosion.
17. No activities shall be performed during periods when the soil is too wet to adequately support equipment. If such equipment creates ruts in excess of six inches deep, the soil shall be deemed too wet to adequately support construction or maintenance activities.
18. No borrow areas shall be permitted on Federal land without a written application for the proposal and NEPA review.
19. Unless otherwise agreed to by the Authorized Officer, power lines, poles and crossbars, and transmission line framing, and/or structures shall be constructed in accordance to standards outlined in "Suggested Practices for Raptor Protection on Power Lines, The State of the Art in 1996," (Avian Power Line Interaction Committee (APLIC), 1996, Edison Electric Institute and the Raptor Research Foundation, Inc., Washington, D.C.). The Holder shall assume the burden and expense of proving that pole, framing, and

structure designs not shown in the above publication are "eagle safe." Such proof shall be provided by a raptor expert approved by the Authorized Officer.

20. The BLM reserves the right to require modifications or additions to all power line structures placed on this R/W, should they be necessary to ensure the safety of large perching birds and to minimize or prevent nesting and perching. Such modifications and/or additions shall be made by the Holder without liability or expense to the United States.
21. The Holder shall remove only the minimum amount of vegetation necessary for all activities.
22. The Holder shall seed disturbed areas within the authorized R/W resulting from grading and other activities. The Holder shall coordinate with the Authorized Officer for seeding method, seed mix, and planting season.
23. The Holder shall be responsible for weed control on disturbed areas within the limits of the R/W. The Holder is responsible for consultation with the Authorized Officer and/or local authorities for acceptable weed control methods. Chemical weed control products shall not be used within 400 feet of any standing or flowing water body or drainage, or slope on which the water can flow.
24. All excess material, which includes vegetation resulting from maintenance, shall be removed from federal land.
25. Construction and maintenance equipment shall have a fire extinguisher, shovel, and axe or Pulaski at all times when on federal land.
26. The Holder shall protect all survey monuments found within the R/W. Survey monuments include, but are not limited to: General Land Office (GLO) and BLM Cadastral Survey Corners, reference corners, witness points, U. S. Coastal and Geodetic bench marks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the Holder shall immediately report the incident, in writing, to the Authorized Officer and the respective installing authority if known. Where GLO or BLM R/W monuments or references are obliterated during operations, the Holder shall secure the services of a registered land surveyor or a Bureau cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the Manual of Surveying Instructions for the Survey of the Public Lands in the United States, latest edition. The Holder shall record such survey in the appropriate county and send a copy to the Authorized Officer. If the Bureau cadastral surveyors or other federal surveyors are used to restore the disturbed survey monument(s), the Holder shall be responsible for the survey cost.
27. No future modifications, construction of improvements, or major maintenance operations involving disturbance of the land shall occur until plans for such actions have been

submitted and approved in writing by the Authorized Officer. Any proposals involving new surface disturbance outside of the authorized R/W area shall require a cultural inventory and may require completion of an environmental assessment. Failure of the Holder to comply with this requirement may result in a suspension of operations authorized by this R/W grant.

28. The Holder shall notify the Authorized Officer if there is a significant variance from the approved action with respect to the use, storage, or disposal of hazardous materials on this R/W.
29. The Holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste ((as these terms are defined in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act (RCRA) of 1976, 42 U.S.C. 6901 et seq.)) on the R/W (unless the release or threatened release is wholly unrelated to the R/W Holder's activity on the R/W). This agreement applies without regard to whether a release is caused by the Holder, its agent, or unrelated third parties.
30. The Holder shall comply with all applicable federal, state, county, and municipal laws and regulations, existing or hereafter enacted or promulgated, with regard to any hazardous material, as defined in this paragraph, that will be used, produced, transported, or stored on or within the R/W or any of the R/W facilities, or used in the construction, operation, maintenance, or termination of the R/W or any of its facilities. "Hazardous material" means any substance, pollutant, or contaminant that is listed as hazardous under the CERCLA of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, 42 U.S.C. 6901 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA section 101(14), 42 U.S.C. 9601(14), nor does the term include natural gas. The Holder is prohibited from discharging oil or other pollutants on federal land or into or upon waters on federal land. The Holder shall give immediate notice of any such discharge to the Authorized Officer and such other federal and state officials as are required by law to be given such notice.
31. The Holder shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) with regard to any toxic substances that are used, generated by, or stored on the R/W or on facilities authorized under this R/W grant. (See 40 CFR, Part 702-799, and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the CERCLA of 1980, Section 102b. A copy of any report required or requested by any federal agency or state government as a result of a reportable release or spill of any toxic

substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved federal agency or state government.

32. The Holder is prohibited from discharging oil or other pollutants on federal land or into or upon waters on federal land. The Holder shall give immediate notice of any such discharge to the Authorized Officer and such other federal and state officials as are required by law to be given such notice.
33. In the event of the release of any hazardous substance, the Holder shall immediately notify the Winnemucca Field Office hazardous materials specialist. The Holder shall be responsible for all work and costs associated with removing the substance from federal lands to the approval of the Authorized Officer. An approved hazardous materials spill kit shall be available in all vehicles and equipment.
34. Use of pesticides shall comply with the applicable federal and state laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the Holder shall obtain from the Authorized Officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the Authorized Officer. Emergency use of pesticides shall be approved in writing by the Authorized Officer prior to such use.
35. The R/W shall be maintained in a sanitary condition at all times. Waste materials at the site shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to: human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.
36. Subleasing authority is not granted.
37. Selling the R/W is not authorized.
38. In accordance with federal regulations in 43 CFR 2807.21, any proposed transfer of any right or interest in the R/W grant and future amendment(s) shall be filed with the Authorized Officer. An application for assignment shall be accompanied by a showing of qualifications of the Assignee. The assignment shall be supported by a stipulation that the Assignee agrees to comply with and to be bound by the terms and conditions of the grant to be assigned. No assignment shall be recognized unless and until it is approved in writing by the Authorized Officer. Fees for assignments shall be in accordance with 43 CFR 2807.21.
39. The R/W shall be relinquished to the United States within 180 days if it is no longer needed for the use it was authorized to serve.
40. Prior to relinquishment or abandonment of any portion of the R/W authorized by this grant and future amendment(s), the Holder shall contact the Authorized Officer to

arrange a joint inspection of the R/W. This inspection will be held to agree to an acceptable rehabilitation plan. This plan shall include, but is not limited to, removal of facilities, surface material, recontouring, topsoiling, or seeding. The Authorized Officer must approve the plan in writing prior to the Holder's commencement of any termination activities. The Holder shall be responsible for the cost and implementation of the approved rehabilitation plan.

41. The Holder agrees to indemnify, defend, and hold the United States harmless from any costs, damages, claims, causes of action, penalties, fines, liabilities, and judgments of any kind or nature arising from the past, present, and future acts or omissions of the United States, or its employees, agents, contractors, or lessees, or any third-party, arising out of, or in connection with, the Holder's use, occupancy, or operations on the R/W. This indemnification and hold harmless agreement includes, but is not limited to, acts and omissions of the United States and its employees, agents, contractors, or lessees, or any third party, arising out of or in connection with the use and R/W which has already resulted or does hereafter result in: (1) Violations of federal, state, and local laws, and regulations that are now, or may in the future become, applicable to the real property; (2) Judgments, claims, or demands of any kind assessed against the United States; (3) Costs, expenses, or damages of any kind incurred by the United States; (4) Other releases or threatened releases of solid or hazardous wastes) and/or hazardous substance(s), as defined by federal or state environmental laws; off, on, into, or under land, property, and other interests of the United States; (5) Other activities by which solids or hazardous substances or wastes, as defined by federal and state environmental laws are generated, released, stored, used, or otherwise disposed on the R/W, and any cleanup response, remedial action, or other actions related in any manner to said solid or hazardous substances or wastes; (6) or natural resource damages as defined by federal and state law. This covenant shall be construed as running with the R/W and may be enforced by the United States in a court of competent jurisdiction.
42. The Holder shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d et seq.) and the regulations of the Secretary of the Interior issued pursuant thereto.
43. If the Holder violates any of the terms and conditions of this grant, the Authorized Officer, after giving written notice, may declare the grant terminated. The Authorized Officer may consult with the Holder and, at the Authorized Officer's discretion, grant a period of time to cure the violation prior to declaring the grant terminated.
44. The effective date of this R/W grant is the date of execution by the Authorized Officer.



FINDING OF NO SIGNIFICANT IMPACT**DEPARTMENT OF ENERGY LOAN GUARANTEE FOR
NEVADA GEOTHERMAL POWER'S
BLUE MOUNTAIN GEOTHERMAL DEVELOPMENT PROJECT
IN HUMBOLDT AND PERSHING COUNTIES, NEVADA**

AGENCY: U.S. Department of Energy, Loan Guarantee Program Office

ACTION: Finding of No Significant Impact

SUMMARY: The U.S. Department of Energy (DOE) is adopting an environmental assessment (EA) completed by the U.S. Department of the Interior's Bureau of Land Management (BLM) in December 2007 that analyzed the potential environmental impacts associated with the construction and startup of Nevada Geothermal Power, Inc.'s (NGP's) Blue Mountain Geothermal Development Project located in Humboldt and Pershing Counties, Nevada. DOE, through its Loan Guarantee Program Office (LGPO), proposes to provide a Federal loan guarantee pursuant to Title XVII of the Energy Policy Act of 2005 to NGP to support the construction and startup of the proposed project. The purpose of DOE's proposed action is to expedite the deployment of a new energy technology into commercial use in the U.S. and to reduce emissions of greenhouse gases and other air pollutants.

The Blue Mountain Geothermal Development project is a conventional geothermal binary power plant. The project's configuration consists of three integrated two-level 16.5 Megawatt (MW) (nameplate rated) energy converter units, each incorporating one 21.25 MW (nameplate rated) double-ended shaft generator driven by two direct coupled special organic fluid turbines, and a cooling system consisting of cooling towers, cooling pumps and all other related systems, totaling 49.5 MW (gross) output. The 49.5 MW (gross) drops to approximately 40 MW (net) when accounting for the energy required to power the binary plant and the production and injection pumps. The high efficiency equipment is meant to provide greater flexibility in the event of lower than expected geothermal temperatures. Geothermal fluids will be re-injected to maintain reservoir pressure and to dispose of effluent.

The project operations area is located in Humboldt County, 20 miles west of Winnemucca, Nevada at the western base of Blue Mountain in the southwest portion of Desert Valley. The electrical transmission line associated with the project extends nine miles into Pershing County, Nevada. The project includes approximately 20 miles of linear right-of-way (ROW), approximately 35 acres of disturbance on BLM land, and approximately 36 acres of disturbance on private land, for a well field and production fluid gathering pipeline system consisting of: up to 9 production wells; 7 injection wells; 3 to 15 temporary water wells used during the drilling phase; up to 4 permanent water wells for the production phase; a 49.5 MW geothermal power plant (on private land); an electrical switching station; and an electrical transmission line of approximately 20 miles. The geothermal power plant, electrical transmission line, electrical

switching station, 1 temporary water well for use during the drilling phase, 3 permanent water wells for production use, 5 geothermal fluid production wells, 5 geothermal fluid injection wells and piping to the production and injection wells have been completed. Drilling of the 6th and 7th geothermal fluid production wells and installation of associated piping and control systems has not been completed. The project area is located in the northern basin and range province in an area of regional high heat flow within the Blue Mountain Geothermal Field. The well field and power plant are located within federal geothermal unit NVN-082457X on four private leases and one federal geothermal lease (NVN-058196).

Because the project was to be developed on BLM lands, BLM completed an EA for the project in December 2007. BLM issued a Finding of No Significant Impact (FONSI) and Decision Record (DR) that allowed NGP to proceed with geothermal development operations more fully described in BLM's EA and FONSI.

All discussion and analysis related to the potential impacts of construction and operation of the proposed NGP facility are contained in the BLM's Final EA (DOE/EA-1746), which is adopted here by reference. BLM examined potential impacts on the following resources and found none to be significant: floodplains; wetlands; water resources and water quality; threatened or endangered species and critical habitats; prime or unique farmlands; geology and soils; visual, recreational, and aesthetic resources; property of historic, archaeological, or architectural significance; Native American concerns; environmental justice; public health and safety; air quality; waste management; transportation; socioeconomic conditions; and noise. BLM did not include analysis of the potential impacts on global climate change or impacts due to intentional destructive acts; therefore DOE is including that analysis in this FONSI.

Global Climate Change

Affected Environment and Environmental Effects

While the scientific understanding of climate change continues to evolve, the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report stated that warming of Earth's climate is unequivocal, and that warming is very likely attributable to increases in atmospheric greenhouse gases (GHGs) caused by human activities (anthropogenic)¹. The Fourth Assessment Report indicates that changes in many physical and biological systems, such as increases in global temperatures, more frequent heat waves, rising sea levels, coastal flooding, loss of wildlife habitat, spread of infectious disease, and other potential environmental impacts are linked to changes in the climate system, and that some changes could be irreversible. GHGs, which include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), are chemical compounds in the Earth's atmosphere that trap heat. Of these gases, CO₂ is recognized by the IPCC as the primary GHG affecting climate change. Present atmospheric concentrations of CO₂ are believed to be higher than at any time in at least the last 650,000 years, primarily as a result of combustion of fossil fuels. It is also very likely that observed increases in CH₄ are partially due to fossil fuel use, according to the IPCC Report.

¹ Intergovernmental Panel on Climate Change, Fourth Assessment Report, Climate Change 2007: Synthesis Report, Summary for Policy Makers, released in Valencia, Spain, November 17, 2007.

The energy produced by the combined cycle steam/binary plant would be free of both GHG emissions and other non-condensable air pollutants. However, some of the binary fluid would be released to the atmosphere from rotating seals and flanges and from the process to purge air leaking into the binary turbine condenser. These binary working fluid emissions are regulated and monitored under a Class II (non-major) permit issued by the Nevada Department of Environmental Protection, Bureau of Air Pollution Control, which NGP has received.

The release of anthropogenic greenhouse gases and their potential contribution to global warming are inherently cumulative phenomena. Greenhouse gas emissions from the proposed action (e.g., emissions related to construction and transportation) would be relatively small compared to the 8,026 million tons of CO₂-equivalent greenhouse gases emitted in the U.S. in 2007², and the 54 billion tons of CO₂-equivalent anthropogenic greenhouse gases emitted globally in 2004. However, emissions from the proposed action in combination with past and future emissions from all other sources would contribute incrementally to the climate change impacts described above. At present DOE is not aware of a methodology that would allow estimation of the specific impacts this increment of climate change would produce in the vicinity of the facility or elsewhere.

However, the project would generate electrical power from a source of energy representing an alternative to carbon-emitting fossil fuels (geothermal power). Accordingly, the project would produce a given amount of energy with fewer GHG emissions than a fossil fuel-burning power plant. Although the project would contribute incrementally to cumulative increases in greenhouse gases and related climate change when combined with other projects globally, GHG emissions from the proposed action would be minimal increases in CO₂ resulting from construction and transportation, and would not be significant.

Consideration of Intentional Destructive Acts

Affected Environment and Environmental Effects

Geothermal generation projects can be the subject of intentional destructive acts ranging from random vandalism and theft to sabotage and acts of terrorism intended to disable the facility. Acts of vandalism and theft are far more likely to occur than sabotage or terrorism. Theft usually involves equipment at substations and switchyards that contain salvageable metal when metal prices are high. Vandalism usually occurs in remote areas and is more likely to involve spontaneous acts such as shooting at equipment.

The risk of damage to the proposed project from intentional destructive acts would be considered very low, in line with or less than the risk to similar generation facilities in the U.S. Theft or opportunistic vandalism is more likely than sabotage or terrorist acts. The results of any such acts could be expensive to repair, but no substantial impacts to continued electrical service would be anticipated. No significant environmental impacts would be expected from physical damage to the proposed project or from loss of power delivery.

Public Involvement in the EA Process

² Energy Information Administration, Report No. DOE/EIA-0573 (2007).

BLM mailed out an "Interested Public" letter on November 3, 2006, announcing the project and seeking public comment through January 5, 2007. A public scoping meeting was held on November 29, 2006, at BLM's local office. The scope of the BLM EA was based on specific issues and concerns identified by BLM, other Federal agencies, state agencies, local agencies, and members of the public. BLM notified the State of Nevada of the availability of the Draft EA for comment on November 16, 2007. BLM also published public notices of the Draft EA's availability for comment on November 20, 2007, prior to finalizing the EA and signing the BLM FONSI and DR on December 18, 2007. BLM notified the State of Nevada and the interested public of the availability of the Final EA, FONSI, and DR on December 21, 2007.

DETERMINATION: On the basis of the Final EA and the additional analysis in this FONSI, DOE has determined that providing a Federal loan guarantee to Nevada Geothermal Power, Inc. for construction and startup of the Blue Mountain Geothermal Development Project located in Humboldt and Pershing Counties, Nevada, will not have a significant impact on the human environment. The preparation of an environmental impact statement is therefore not required, and DOE is issuing this FONSI.

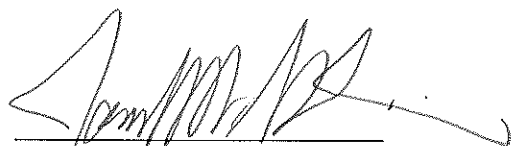
Copies of the Final EA are available at the DOE Loan Guarantee Program Office website at <http://www.lgprogram.energy.gov/NEPA-1.html> or from

Lynn Alexander
NEPA Document Manager
U.S. Department of Energy
1000 Independence Ave, SW
Suite 4B-196 CF-1.3
Washington, DC 20585
Lynn.Alexander@hq.doe.gov

Additional information on the DOE NEPA process is available from

Office of NEPA Policy and Compliance
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585
202-586-4600 or 1-800-472-2756

Issued in Washington, DC on the 26th day of April in the year 2010.


Jonathan Silver
Executive Director, Loan Programs