Resource Contingency Program—Oregon

Final Environmental Impact Statement Hermiston Power Project

Introduction

The Bonneville Power Administration (BPA) has statutory responsibilities to supply electrical power to its utility, industrial, and other customers in the Pacific Northwest. In 1990, to cover the outer range of potential load growth with new resources, BPA embarked upon the Resource Contingency Program (RCP). Instead of buying or building generating plants now, BPA has purchased options to acquire power later, if and when it is needed.

The decision to acquire any of these option energy projects to fulfill statutory supply obligations will be influenced by Federal system load growth, the outcome of BPA's Business Plan, required operational changes in Columbia-Snake River Hydroelectric facilities, and the loss of major generating resources.

In September 1993, three option development agreements were signed with three proposed natural gas-fired, combined cycle combustion turbine CT projects near Chehalis and Satsop, Washington, and near Hermiston, Oregon. Together these three projects could supply BPA with 1,090 average megawatts (aMW) of power. Under these agreements, sponsors are obtaining permits and conducting project design work, and BPA is completing this EIS process.

In September 1993, BPA published a Notice of Intent to prepare an environmental impact statement (EIS) on these three proposed gas-fired combustion turbine projects and held public scoping meetings in October 1993 at each site. In February 1994, BPA released an Implementation Plan on the proposed scope of the EIS. A draft EIS on the three proposed projects was published in February 1995.

BPA has concluded that publication of the RCP final EIS should be separated into two documents. The impacts of the Chehalis and Satsop projects located in Washington State will be covered in one EIS document, while the impacts of the Hermiston project located in Oregon are covered in this final EIS document. This change was made to better accommodate the scheduling requirements for the Energy Facility Siting Council (EFSC) and Energy Facility Site Evaluation Council (EFSEC) processes that are underway in Oregon and Washington, respectively, and to reduce costs for publication of the final EIS.

This decision does not alter in any way BPA's proposal and alternative actions as described in the draft EIS. It is BPA's intent to continue to base the analysis of impacts on the assumption that all three projects may be constructed at some point in the future.

Separation of the final EIS into two documents provides the following benefits:

- Environmental impacts of the Satsop and Chehalis projects, including regional and Chehalis basin issues raised in the public comments, will be covered in a single document.
- Washington EFSEC will be able to review and adopt for compliance with the State Environmental Policy Act (SEPA) a final EIS document that has as its focus the impacts of the Chehalis and Satsop projects located in Washington.
- Oregon EFSC is able to review a final EIS document as part of its process that has as its focus only the Oregon project.
- Printing and distribution costs are reduced, as persons on the RCP mailing list are primarily interested in reading an EIS for projects under their jurisdiction or located in their state.

BPA will, on completion of both the Oregon and Washington EIS processes, prepare a record (or records) of decision on which, if any, of the projects to hold for potential future acquisition.

This EIS addresses three proposed alternatives: the proposed action, no action, and other actions. The proposed action is the acquisition of power from both units optioned at the Hermiston Power Project Plant site (only if there is a need for power at a future date), or wheeling of power by BPA if another party acquires the output. This EIS addresses the environmental effects of constructing and operating both units under option for power delivery to BPA.

Alternatives to the RCP itself are examined in BPA's 1990 and 1992 Resource Programs and the final environmental impact statement prepared on those programs. BPA issued a Record of Decision on the Resource program EIS in April 1993 (DOE/EIS-0612). That EIS is based on the resource needs identified in the 1990 and 1992 Resource Programs. The present EIS is tiered on that earlier environmental review in order to eliminate repetitive discussions of the same issues and to focus on the issues ripe for decision here. Copies of the earlier EIS and Record of Decision are available from BPA.

Project Description

The Hermiston Power Project (HPP) would be located 4.8 km (3 miles) south of Hermiston, Oregon, in an industrial area adjacent to the J.R. Simplot potato processing plant (Figure S-2). The project site is surrounded by agricultural land, agricultural businesses, and railroad yards.

The cogeneration project consists of up to two gas-fired combined cycle combustion turbines that could supply BPA up to 430 aMW of firm power. In emergency situations when natural gas is not available, the project could burn fuel oil for up to 15 days per year. The project would require two natural gas pipelines to connect to both Pacific Gas Transmission (PGT) and Northwest Pipeline (NWP). The gas pipelines are 6.4 km (4 miles) and 13 km (8 miles) long, respectively. The project would store 7.6 million liters (2 million gallons) of fuel oil in aboveground storage tanks.

The cogeneration facility's process wastewater, including cooling tower blowdown, would be collected and routed to the existing Simplot potato plant land application system for use in crop irrigation. Sanitary wastes would be disposed of by routing to the J.R. Simplot Company sanitary sewer system.

In addition to the production of electricity for BPA, excess steam from waste heat in the power plant would be used by the J.R. Simplot potato plant for processing operations. The existing boilers at the plant could be shut down and placed in a stand-by condition.

Water for the cogeneration facility would be purchased from the Port of Umatilla regional water system, which draws water from the Columbia River under an existing water right. The HPP would require an average of 6,000 liters per minute (lpm) (1,944 gallons per minute [gpm]) of process water. The water supply for the project would originate at the Port of Umatilla treatment facility and be transported to the cogeneration facility site by a 2.1-km (1.3-mile) pipeline that would parallel State Route (SR) 207 to the project site. Potable water would be obtained from the J.R. Simplot Potato Processing Plant adjacent to the proposed cogeneration facility site.

There are two transmission alternatives to connect the project into BPA's McNary Substation: the Western 230-kV Alternative and the Eastern 500-kV Alternative.

<u>Western 230-kV Alternative</u>

The Western 230-kV Alternative involves using, for the most part, an existing Umatilla Electric Cooperative Association (UECA) 115-kV transmission line corridor that generally runs parallel to the eastern boundary of the Umatilla Ordnance Depot from the Westland Substation at the Lamb-Western potato plant north to the city of Umatilla, then east and north to the McNary Substation. The UECA 115-kV line is planned for upgrading to two 230-kV circuits to accommodate both the existing 115-kV UECA line and a 230-kV line required by the planned Hermiston Generating project (HGP) at the Lamb-Weston potato plant site 3.2 km (2 miles) west of the proposed HPP. This upgrading will take place prior and independent to the HPP being developed. The 230-kV conductor dedicated to UECA will be taken over by the HPP, and UECA will construct a new 115-kV distribution line along Power Line Road.

The project would be connected to the UECA line at the Westland Substation by construction of approximately 2.4 km (1.5 miles) of new 230-kV line from the cogeneration facility site west and then north to Feedville Road, and then continuing approximately 3.2 km (2 miles) west along Feedville Road to the Westland Substation at the Lamb-Weston plant. The portion of the proposed 230-kV line along Feedville Road would be constructed on the same poles supporting an existing UECA 115-kV line from Westland Substation to the Feedville Substation.

Eastern 500-kV Alternative

This alternative consists mainly of a new 500-kV single-circuit line constructed within a 13.7-km (8.5-mile) portion of the existing 76.2-m (250-foot) wide BPA McNary-Roundup Corridor between Feedville Road and the McNary Substation. The new 500-kV line would be constructed on steel poles or towers on the eastern side of the existing 230-kV McNary-Roundup Line No. I.

From the McNary Substation south for a distance of approximately 1.4 km (0.9 mile), the HPP would use the existing BPA 500-kV McNary-Lower Monumental transmission line's poles and conductors. At the southern end of that line segment, the HPP 500-kV line would depart from the McNary-Lower Monumental corridor and continue south and slightly west along a new route for a distance of approximately 0.6 km (0.4 mile), to the point where the line reaches the BPA 230-kV McNary-Roundup corridor.

A new section of McNary-Lower Monumental 500-kV line would need to be constructed to replace that portion taken over by the project. This section, which is approximately 1.6 km (1 mile) in length, would be located about 0.2 km (0.1 mile) west of its present location.

The connection from the cogeneration facility to the McNary-Roundup Corridor (approximately 8.7 km [5.4 miles]) would consist of a new 500-kV line on steel poles along the proposed NWP Gas Line Alternative route, most of which is along the south side of Feedville Road.

Affected Environmental and Environmental Impacts

Table S-2 provides a summary of potential impacts from the HPP to the physical and social environment, and mitigation measures. The resource areas evaluated in the EIS are briefly described below.

Geology, Soils, and Floodplains

Geology in the project vicinity is typical of the Columbia Plateau, with low seismicity and stable terrain. Soils, too, are typical of a broad region of the Columbia Plateau, with deep, sandy soils derived from alluvium and wind-blown deposits. The 100-year floodplain of the Umatilla River lies within 0.8 km (0.5 mile) of the project.

There are no unique geologic sites associated with the project components. There are no active faults in the project vicinity and seismicity in the area is of moderate intensity. Soil erosion during project construction may cause minor and temporary increases in sedimentation to water courses. The Western 230-kV Alternative has two crossings of the Umatilla River, but the transmission line will be located on existing poles and there will be no construction within the river. Soil compaction during construction may inhibit revegetation efforts resulting in additional erosion. Up to 2 hectares (ha) (5 acres) of prime farmland will be permanently lost at the cogeneration facility. With soil erosion control mitigation, constructing the facility to meet earthquake standards for the area, and the project's minor amount of permanent loss of prime farmland, the project is considered to have low impacts to geology, soils, and floodplains.

Water Resources

The water supply source for the proposed project is the Port of Umatilla's water project which will pump water from the Columbia River for municipal and industrial use. Columbia River water availability is good, as is its quality. Groundwater quality near the proposed cogeneration facility does not currently meet Federal drinking water standards for nitrates and total dissolved solids. The Columbia River indirectly and the local groundwater directly would receive the project's wastewater effluent through an agricultural land application process.

The project will require 7,135 lpm (1,855 gpm) from the Umatilla water project which is approximately 2.8 percent of the Port's supply. Approximately 6,000 lpm (1,944 gpm) of wastewater effluent would be reused through the adjacent J.R. Simplot land application facility as a local irrigation supplement. The proposed cogeneration facility's 38.6 lpm (146 gpm) effluent would be combined with Simplot process water, then land applied to irrigated cropland under Simplot's existing discharge permit. Because the project uses only a small fraction of the regionally available water supply, and process effluent from the project will be managed through an existing land application, the project is considered to have low impacts to water resources.

Air Quality

In Umatilla County ambient concentrations of regulated air pollutants currently meet national standards. The proposed project would annually emit 341 metric tons (376 tons) of NO_x, 86 metric tons (94 tons) of particulates, 816 metric tons (899 tons) of CO, 36 metric tons (39 tons) of SO_2, and 42 metric tons (46 tons) of VOCs. Because the predicted levels of NO_x and CO are greater than 100 tons per year, the project would be considered a major new stationary source of air emissions for these pollutants, and subject to strict state and Federal control requirements. The project would also emit 140.0 metric tons (154 tons) of ammonia per year, 1.5 metric tons (1.7 tons) of benzene, and 2.8 metric tons (3.1 tons) of formaldehyde, all of which are greater than Oregon Significant Emission Rates for Toxic Air Pollutants (TAPs).

Ambient concentrations of air pollutants resulting from emissions from the cogeneration project, determined from dispersion modeling, would be less than the Oregon Source Impact Levels. Emissions of NO_x would be mitigated with low NO_x burners, and Selective Catalytic Reduction (SCR).

Plume lengths from the cooling tower are predicted to be less than 1,300 m (4,265 feet) 90 percent of the time. Fogging will not affect any major highways. Only a few hours within a 5-year period of fogging (and road icing) are predicted for the Simplot access roads (nearest affected roadways) as a result of the cooling towers plumes.

When the project is in operation, the existing steam boilers at the potato processing plant could be shut off, and therefore, the project could reduce these air emissions. Based on the expected design control technology and mitigation measures, air quality impacts from the project are considered low.

Noise

The cogeneration facility site is located in an area surrounded by industrial and agricultural uses. Construction noise would be typical of noise from similar projects and is exempt from Oregon State regulations. Operational noise modeling including attenuation predicted that the noise from the cogeneration facility would be less than the state 50 dB(A) nighttime residential standard. Because of the industrial use of the area and the proposed noise attenuation measures, overall noise impacts are considered low.

Vegetation and Wetlands

The project lies within Oregon's Columbia Plateau physiographic province. Much of the natural vegetation in the vicinity of the project has been disturbed or eliminated by agricultural and rural development. Several emergent, scrub-shrub, and forested wetland habitats are found in the project vicinity. Riparian habitats are located along the Umatilla River and several irrigation ditches.

Site-specific surveys of the project vicinity have been conducted for rare plants and wetlands. No rare plants were located during the surveys.

Approximately 6.9 ha (17 acres) of cropland would be permanently converted to industrial use at the cogeneration facility site. Less than 0.4 ha (1 acre) of wetlands would be permanently filled for construction of the gas and electrical transmission lines.

Western 230-kV Alternative. A total of 4.49 ha (11.1 acres) of vegetation and wetlands would be impacted if the

Western 230-kV Alternative is chosen. Approximately 4.25 ha (10.5 acres) would be temporarily disturbed and 0.04 ha (0.1 acre) would be permanently disturbed.

Eastern 500-kV Alternative. A total of 4.53 ha (11.2 acres) of vegetation and wetlands would be impacted if the Eastern 500-kV Alternative is chosen. Approximately 4.45 ha (11.0 acres) would be temporarily disturbed and 0.06 ha (0.16 acre) would be permanently disturbed.

Construction of the water supply and natural gas pipelines would affect areas of shrub-steppe and grass/forb vegetation, wetlands, and cropland. However, only about 0.4 ha (1 acre) of these areas would be permanently affected.

Impacts from the project on vegetation and wetlands are considered low, because the majority of the impacts are temporary in nature, disturbed areas will be reseeded with native plant species, protection will be taken to minimize soil erosion, and the disturbed area will be returned to its original contours.

Wildlife and Fishery Resources

The project vicinity supports a variety of wildlife including species that are typical of arid grassland and shrub-steppe habitats, riparian habitats, and wetlands. Because riparian and wetland habitats are relatively rare in the region, these habitats are especially important for local wildlife populations. The Umatilla River provides most of the riparian habitat, while wetlands are associated with the Umatilla River and the Power City Wildlife Area located along the Eastern 500-kV Alternative route. The Columbia River 15 km (9 miles) north of the cogeneration facility site contains important anadromous salmon and steelhead fish stocks.

The bald eagle as the only threatened or endangered species that may occur within a 8-km (5-mile) radius of the project. All of the bald eagle observations were along the Umatilla River or in other habitats to the south of the river during winter surveys. There is no designated critical habitat for any Federally listed species in the project vicinity.

Western 230-kV Alternative. Impacts of construction and operation of the HPP on wildlife include: (1) temporary disturbance of 4.25 ha (10.5 acres) of wildlife habitat; (2) permanent conversion of 0.04 ha (0.1 acre) of wildlife habitat; (3) displacement and increased disturbance of wildlife from noise of construction and operation; and (4) increased risk of avian collisions and electrocution caused by new transmission lines. The Western 230-kV Alternative maximizes the use of existing transmission ROW and poles and therefore the degree of impact is less for this alternative than the Eastern 500-kV Alternative. Impacts to wildlife resources for this alternative are considered low.

Eastern 500-kV Alternative. Impacts of construction and operation of the HPP on wildlife include: (1) temporary disturbance of 4.45 ha (11.0 acres) of wildlife habitat; (2) permanent conversion of 0.06 ha (0.16 acre) of wildlife habitat; and (3) displacement and increased disturbance of wildlife from noise of construction and operation. Impacts to wildlife resources for this alternative are considered low. Overall impacts to wildlife and fishery resources are considered low.

Construction of the PGT gas line would result in the permanent loss of less 0.1 ha (0.1 acre) and temporary disturbance of approximately 8 ha (20 acres) of mostly shrub-steppe habitat.

Construction of the NWP gas line would temporarily affect about 16 ha (40 acres) and permanently affect less than 0.1 ha (0.1 acre) of mostly grassland habitat and cropland.

Construction of the water supply line would temporarily disturb about 2 ha (5 acres) of mostly cropland.

Land Use

The project would be located in the southwest portion of Umatilla County, Oregon. The cogeneration facility would be located approximately 4.8 km (3 miles) south of the city of Hermiston, and 6.4 km (4 miles) west of the city of Stanfield. Both transmission alternatives would be located primarily in unincorporated Umatilla County, but would also pass through several jurisdictions. Both of the gas pipelines would be primarily located in unincorporated Umatilla County, although the PGT route would enter into the Urban Growth Boundary of the city of Stanfield. The water supply pipeline would be located entirely in unincorporated Umatilla County.

All of the project facilities including both transmission alternatives would be compatible with the comprehensive plan or zoning land use designations assigned to the lands in which the facilities would be located. Some of the facilities would be allowed as a permitted use. The majority of facilities would be permitted as conditional uses by the governmental jurisdictions in which they would be sited. Because, the project components are consistent with county and local land use designations, but will require conditional use permits, the project is considered to have a low impact to land use.

Cultural Resources

An historic properties inventory of the project vicinity resulted in discovery of six historic area canals and three trash dumps. The canals are eligible for NRHP nomination as part of the Bureau of Reclamation's Umatilla Project.

The Eastern 500-kV Alternative crosses six canals, and the Western 230-kV Alternative one canal. Each of the two natural gas pipelines would cross one canal. However, the project's effects on elements of these historic properties would be minor because placement of the transmission line towers or poles could avoid the canals, the gas pipelines would be tunneled underneath the structure, or the canals would be restored to their original condition. The project, therefore, is considered to have a low impact on cultural resources.

Socioeconomics

The predominantly rural Umatilla County had a 1992 population of 61,100. Accordingly, the agricultural business and employment sector plays a significant role in the economy in the county. In addition, a large secondary sector provides services to the agricultural industry. Impacts to employment would be most pronounced during the 2-year construction phase when up to 300 people would be employed on a monthly basis. During operation, the project would create 24 jobs. After 3 years of operation, the county would benefit by increased property taxes worth approximately $5 million annually. Other taxes such as business and natural gas taxes would also be collected. Increases in housing demand and traffic patterns would be minor and could be mitigated. The project would provide a relatively inexpensive source of steam to the potato processing plant and help that facility keep a competitive advantage. Overall, the project is considered to have a low, beneficial socioeconomic impact.

Recreational Resources

There are no recreational facilities that would be affected by project facilities nor in the project vicinity, and therefore there will be no impact to recreational resources.

Public Health and Safety

Natural gas and fuel oil would be used or stored on site, both of which are flammable and can be explosive under certain circumstances. Lubricating oils, hydraulic fluids, cleaning solvents, paint, paint thinners, wastewater from cooling tower collection sumps, and other materials and process wastes would be found on site, and could pose a risk to public health and safety if not used and disposed of properly. Some materials are classified as hazardous and would need careful handling and disposal to protect human health.

Visual Quality

The cogeneration facility site is located in an industrial area south of the city of Hermiston. Surrounding lands in the project vicinity are primarily agricultural. The industrial area and nearby agricultural areas contain industrial, warehouse, and agricultural buildings and facilities. The industrial area and cogeneration facility site can be viewed by travelers on I-82, I-84, and SR 207.

A number of existing transmission lines occur in the project vicinity connecting with the McNary Substation. These are located adjacent to local roads, and/or pass through agricultural and open lands.

The cogeneration facility would intensify the industrial character of the area where it would be sited. Because the facility would be similar in appearance to existing nearby industrial and agricultural facilities, it would be visually compatible with the existing visual character of the area. The gas transmission lines would create only a temporary and minor visual disturbance through primarily grass and agricultural lands. The visual impacts of the cogeneration facility and the gas pipelines, therefore, would be considered low. The potential visual impacts of the two transmission line alternatives are compared below.

Western 230-kV Alternative. This alternative would minimize the need for new transmission poles by using existing UECA poles. Although the UECA would have to rebuild a new section of 115-kV line, this transmission line would not be viewed by large numbers of people, and would generally follow existing transmission corridors. The visual impacts of this alternative are, therefore, considered low.

Eastern 500-kV Alternative. This alternative involves constructing a new transmission line with steel towers or poles, mainly using a vacant ROW adjacent to the existing McNary-Roundup 230-kV transmission line. However, this new 500-kV transmission line would likely be quite noticeable to travelers on Highway 395 and many rural residences east of Hermiston, even though the main portion of it would be within existing ROW. Therefore, the visual impacts of this alternative are considered moderate.

Figure S-1 Project Vicinity Map

Table S-1 Summary of Potential Impacts and Mitigation Hermiston Power Project

1.0 INTRODUCTION

1.1 Purpose and Need

1.1.1 Need

The Bonneville Power Administration (BPA) has statutory responsibilities to supply electrical power to its utility, industrial, and other customers in the Pacific Northwest region as defined by the Northwest Power Planning and Conservation Act. In 1990, to ensure that new resources would be available to meet the highest potential load growth, BPA embarked upon the Resource Contingency Program (RCP). Instead of buying or building generating plants now, the RCP allows BPA to purchase options to acquire power later, if and when it is needed.

The environmental consequences of acquiring all of the options under the RCP include construction and operation impacts that would occur if and when a decision were to be made between the years 1996 and 2005 to acquire their output. The decision to acquire any or all of these option energy projects to fulfill statutory supply obligations is influenced by the following variables:

- Federal System Load Growth
  Because load growth cannot be predicted with certainty, BPA and the Northwest Power Planning Council (Council) have developed a series of forecast scenarios that encompass plausible variations in the factors that determine loads. The 1991 BPA and Council Joint Forecast shows that Federal System loads will most likely increase between 0.5 percent (medium-low case) and 1.2 percent (medium-high case). Higher load growth makes it more likely the optioned resources would need to be acquired.
- BPA Business Plan 1995
  In 1993, BPA embarked on a major effort to reassess its role and need for resources. That process is still very much in a development stage; however, it has provided preliminary indications that BPA's load growth may not be as high as was predicted in the 1990 and 1992 resource programs, and that BPA's customers may develop more resources to serve their own loads than was previously anticipated. The more resources that BPA customers develop on their own, the less likely it is that the optioned resources would need to be acquired. As documented in BPA's June 1994 Draft Strategic Business Plan, BPA plans to primarily rely on purchased power and nonfirm energy to meet load growth during the next 3 to 5 years, but will also maintain resource options from the RCP in case they are needed. Furthermore, as a result of the Strategic Business Plan, BPA may acquire the output of the resource to meet loads or provide energy management services (e.g., fuel management, wheeling, energy backup etc.) for these specific resources when acquired by a customer for their power needs.
- Columbia-Snake River Hydroelectric Facilities Operational Changes
  Operation changes in the hydro system to benefit listed fish stocks under the Endangered Species Act (ESA) or to implement the Council's Fish and Wildlife Program are occurring and are still very much in the development stage. Future actions by regulatory agencies could reduce firm output of the hydro system further, perhaps by hundreds of average megawatts (aMW) thereby increasing the need for new energy resources. The need for acquiring the optioned resources will increase as production from the hydro system decreases.
- Canadian Entitlement
  In February 1994, BPA prepared a draft EIS (DOE/EIS-0197) on the Delivery of the Canadian Entitlement from the three storage dams constructed in Canada on the Columbia River as a result of the 1964 Columbia River Treaty with Canada. That EIS evaluates the environmental effects of various options for disposition of the Canadian Entitlement. Alternatives include various purchase, generation, and transmission development components. Disposition of the Canadian Entitlement must begin in 1998 concurrent with the expiration in steps

of the past sale of Canadian Entitlement within the United States. These option projects could be used to generate power for the disposition of entitlement benefits to Canada.

- Loss of generating resources
  In 1992, Portland General Electric (PGE) decided to permanently close the Trojan Nuclear Power Plant. Through a net billing contract with the Eugene Water and Electric Board, Trojan provided BPA 214 aMW of energy. It is possible that other power plants may shut down in the Pacific Northwest in the near future for re-licensing, technical, or economic reasons. If other plants close or reduce their output, the need for optioned resources will increase.

1.1.2 Purpose

The purposes underlying the potential acquisition of these optioned resources include the following:

- reduce resource lead time necessary to bring a needed resource to commercial operation.
- meet contractual obligations to supply requested cost-effective electrical power to BPA customers while minimizing adverse environmental impacts;
- ensure consistency with BPA's statutory responsibilities, including the Pacific Northwest Electric Power Planning and Conservation Act, while taking into account the Council's Conservation and Electric Power Plan and Fish and Wildlife Program, the National Energy Policy Act, and the ESA as amended;
- restore and enhance environmental quality, and avoid or minimize potential adverse environmental effects; and

1.1.3 Background

In 1990, BPA embarked on a multifaceted resource acquisition program to fulfill the most likely range of need by acquiring: all cost effective conservation; cost-effective unsolicited renewable and thermally matched cogeneration projects; various energy projects through the billing credits and competitive acquisition solicitations, and wind and geothermal demonstration projects. At that time, to cover the outer range of need (lower probability of need) BPA embarked upon the RCP to purchase energy options.

In May 1992, BPA issued a RCP solicitation. In response to BPA's request for energy options, 64 proposals were submitted from 47 developers totaling 7,842 aMW of energy. The proposed projects where evaluated against the RCP goals of project viability, cost-effectiveness, and minimal environmental impacts. BPA selected three projects that best met these goals. The Resource Contingency Program followed a multi-step evaluation process in order to select the three finalists for negotiating Energy Option Agreements. The first step in the evaluation process involved a preliminary screening and pre-qualification process to identify sponsors who demonstrated a high level of experience and capability. In June 1992, BPA announced a list of 25 most highly qualified proposals for further evaluation. These proposals are identified on Table 1-1.

Table 1-1. List of 25 Qualified Proposals for RCP

Sponsor	Location	Type of Project	Min. aMW
Basin Electric	Beula, ND	Coal	80.0
CA Energy	Sparks, NV	Geothermal	29.8
Chehalis Power	Chehalis, WA	Cogeneration	223.0

Coburg Power	Coburg, OR	Cogeneration	118.4
Community Energy	Twin Falls, ID	Cogeneration	42.8
Energy Initiatives	Portland, OR	Cogeneration	221.0
Enserch	Kalama, WA	Cogeneration	209.0
Enserch	Tacoma, WA	Cogeneration	209.0
Hanford Generating	Hanford, WA	Cogeneration	213.0
Ida-West Energy	Hermiston, OR	Cogeneration	141.0
Ida-West Energy	Heyburn, ID	Cogeneration	41.4
PacifiCorp	N/A	System Sale	Neg.
SDS Lumber	Bingen, WA	Cogeneration	31.0
SEI	Bremerton, WA	Cogeneration	111.0
Sithe Energies	Tacoma, WA	Cogeneration	100.0
Supply System	Satsop, WA	CT	160.0
Tenaska Power	Malin, OR	CT	200.0
U.S. Generating	Post Falls, ID	CT	46.5
U.S. Generating	Hermiston, OR	Cogeneration	46.5
U.S. Windpower	Cut Bank, MT	Wind	30.0
U.S. Generating	Tacoma, WA	Cogeneration	46.5
United Cogeneration	Seatac, WA	Cogeneration	41.1
Unocal	Hope, B.C. (Canada)	CT	100.0
Willpenn Power	Tacoma, WA	Cogeneration	144.0
Willpenn Power	Pasco, WA	CT	199.5
Total aMW:			2784.78

In July 1992, these 25 developers were invited to submit detailed project proposals. Each of these short-listed resource proposals were evaluated to determine (1) the system cost of the resource, (2) the viability of the resource, and (3) the non-price environmental impediments of the resource.

The system cost of the resource was assessed based on the life-cycle costs. These costs included an evaluation of fuel costs, construction costs, financing costs, and operating and maintenance costs.

The viability review evaluated the ability of the sponsor to: obtain financing; interconnect the project into the federal power system; obtain competitive fuel supply contracts; obtain permits and licenses; and evaluate the thermal host for cogeneration projects. The non-price environmental impediments review evaluated the (1) potential for the project site to be located on a significant hazardous waste site; (2) potential for the project to have significant non-price environmental impediments; and (3) potential for projects to increase ozone precursor gases (NO_x or VOC) in nonattainment areas pursuant to the 1990 Clean Air Act Amendments.

At least one proposal was removed from further consideration for being located on what BPA considered to be significant hazardous waste site. BPA made this determination based upon responses to 21 questions BPA outlined in the response package that addressed the extent of contamination, the contaminants, and the ability of the sponsor to address and mitigate and/or clean up the hazardous waste.

Projects were also rejected for having what BPA considered to be significant non-price environmental impediments. This determination was based upon responses to approximately 30 questions BPA outlined in the response package in addition to responses to questions regarding impacts on 41 identified protected sites and unique habitats.

Projects that increased emissions of ozone pre-cursor gases in ozone non-attainment airsheds (e.g., Snohomish, King and Pierce Counties, and the Vancouver metro area in Washington and the Portland metro area in Portland) were also not considered for the final negotiation group.

BPA's non-price environmental impediments evaluation received equal weighting with the price and viability evaluation in the resource option selection process. Price, viability, and environmental impediment evaluations were developed to coincide with the Northwest Power Planning Council's goal of ensuring that the Pacific Northwest has an adequate, efficient, economical, and reliable electricity supply. Each proposal selected, after applying these criteria, was then compared with the 1991 Power Plan recommendations and BPA's resource needs. In December 1992, BPA identified ten sponsors for initial negotiation that best met these needs (see Table 1-2).

Table 1-2. Negotiation Group

Sponsor	Location	Type of Project	aMW
Chehalis Power	Chehalis, WA	Cogeneration	420
Coburg Power	Coburg, OR	Cogeneration	120
Hanford Generating	Hanford, WA	Cogeneration	214
Ida-West Energy	Hermiston, OR	Cogeneration	435
PacifiCorp System	N/A	Sale	26
SEI	Bremerton, WA	Cogeneration	223
Supply System	Satsop, WA	CT	160
Tenaska	Brooks, OR	Cogeneration	240
U.S. Generation	Hermiston, OR	Cogeneration	217
Willpenn	Pasco, WA	CT	209

After further discussions with these 10 developers in the winter of 1993, each of these finalist sponsors were invited to submit best and final proposals. These proposals were evaluated to determine (1) the system cost of the proposed power purchase; (2) the viability of the project; and (3) the potential for environmental impediments resulting from the development and operation of the project. All three evaluations were given equal weighting in the selection process. As part of the non-price environmental impediments review, BPA identified environmental issues for all ten proposed project sites.

Topical outlines of all potential environmental impacts were prepared after site visits by environmental specialists and Federal and state agency consultation on potential environmental issues. Issues addressed include:

- environmental policy;
- threatened and endangered species;
- fish and wildlife conservation;
- heritage conservation;
- state, area-wide, and local plan and program consistency;
- coastal management;
- floodplains;
- wetlands;
- prime and unique farmlands;
- recreation resources;
- global warming;
- hazardous waste contamination; and
- air and water pollution control and abatement.

Following this evaluation of alternatives, in April 1994 BPA selected three proposals to participate in the option program.

In September 1993, three option develop agreements were signed that could supply BPA with 1,090 aMW of power. All three proposed projects are natural gas-fired, combined-cycle combustion turbines (Table 1-3). Under these agreements developers are conducting environmental studies and project design work, obtaining permits, and BPA is completing this EIS process. These three natural-gas-fired power plants are being designed and permitted in order to be ready for construction should resource demand or supply constraints materialize. The costs of optioning energy resources is low in comparison to building power plants ahead of need. In addition, unnecessary environmental impacts to air, water, and land resources can be avoided.

Table 1-3. RCP Projects

Project	Developer	Location	# of Units	aMW	Option
Chehalis Power	CRSS Capital	Chehalis, WA	2	230	1995-2005
Hermiston Power	Hermiston Power Partnership	Hermiston, OR	2	215	1995-2000
Satsop Unit 1	Washington Public Power Supply System (Supply System)	Satsop, WA	1	245	1995-2005

In September 1993, BPA published a Notice of Intent to prepare an environmental impact statement (EIS) on these three proposed gas-fired combustion turbine projects and held public scoping meetings in October 1993 at each site. In

February 1994, BPA released an Implementation Plan on the proposed scope of the EIS. A draft EIS on the three proposed projects was published in February 1995. This EIS is "tiered" to the 1993 Resource Program's EIS, and analyzes in more detail the environmental impacts of the option program. The EIS analyzes the "worst case" scenario for each project. While the three projects are not technically considered alternatives by BPA (because all three could be implemented), BPA retains the option to order that any number of the three projects be built.

BPA has concluded that publication of the RCP final EIS should be separated into two documents. The impacts of the Chehalis and Satsop projects located in Washington State will be covered in one EIS document, while the impacts of the Hermiston project located in Oregon are covered in this final EIS document. This change was made to better accommodate the scheduling requirements for the Energy Facility Siting Council (EFSC) processes that are underway in Oregon and similarly, the Energy Facility Site Evaluation Council (EFSEC) in Washington and to reduce costs for publication of the final EIS.

This decision does not alter in any way BPA's proposal and alternative actions as described in the draft EIS. It is BPA's intent to continue to base the analysis of impacts on the assumption that all three projects may be constructed at some point in the future.

Separation of the final EIS into two documents provides the following benefits:

- Environmental impacts of the Satsop and Chehalis projects, including regional and Chehalis basin issues raised in the public comments, will be covered in a single document.
- Washington will be able to review and adopt for compliance with the State Environmental Policy Act (SEPA) a final EIS document that has as its focus the impacts of the Chehalis and Satsop projects located in Washington.
- Oregon EFSC is able to review a final EIS document as part of its process that has as its focus only the Oregon project.
- Printing and distribution costs are reduced, as persons on the RCP mailing list are primarily interested in reading an EIS for projects under their jurisdiction or located in their state.

BPA will, on completion of both the Oregon and Washington EIS processes, prepare a record (or records) of decision on which, if any, of the projects to hold for potential future acquisition.

1.2 Alternatives

1.2.1 No Action

Under the no action alternative, BPA would not acquire the energy output associated with the Hermiston Power Project, thereby foregoing the opportunity in the future to reduce a potential energy deficit with this project. In that event, this project would not be constructed without a commitment from another party to acquire the energy output. If the project was not constructed, the environmental impacts associated with it would not occur.

1.2.2 Proposed Action

The proposed action is the acquisition of power from both units optioned at the Hermiston Power Project Plant site (only if there is a need for power at a future date), or wheeling of power by BPA if another party acquires the energy output. The decision to purchase the output from the project will be made only: (1) during a 5-year holding period following this EIS process; (2) if it is determined that there is a need to purchase a block of power; and (3) if BPA has determined that one or more units under the RCP are cost-effective relative to other available resources.

This EIS addresses the environmental effects under the scenario that the Hermiston Power Project is constructed and operated for power delivery to BPA. However, during the time period of this optioned resource (1995 to 2000), BPA's need for power may be equal to or greater than the energy available from all three projects. Therefore, the five units of the three optioned projects (Hermiston, Satsop, and Chehalis) are not considered alternatives to one another.

Alternatives to the RCP itself are examined in BPA's 1990 and 1992 Resource Programs and the final environmental impact statement prepared on those programs. BPA issued a Record of Decision on the Resource program EIS in April 1993 (DOE/EIS-0612). That EIS is based on the resource needs identified in the 1990 and 1992 Resource Programs. The present EIS is tiered on that earlier environmental review in order to eliminate repetitive discussions of the same issues and to focus on the issues ripe for decision here. Copies of the earlier EIS and Record of Decision are available from BPA.

1.2.3 Other Actions

Since the proposed action may satisfy only part of BPA's power needs, other resources will be considered independent of the proposed action, including acquisition of all cost effective conservation. Furthermore, once the need for power determination has been made, BPA will compare these optioned resources against other resources, and BPA may pursue other resources independent of the optioned projects. Other resource types potentially available to meet future loads include the following:

- Conservation (commercial, residential, and industrial)
- Renewables (hydropower, geothermal, wind, and solar)
- Cogeneration
- Combustion Turbines
- Nuclear Power
- Coal and Clean Coal
- Imports

These alternatives and their environmental impacts are examined in BPA's 1990 and 1992 Resources Programs and accompanying environmental review. In BPA's April 1993 Record of Decision on the Resource Program Environmental Impact Statement (DOE/EIS-0162) which is based upon resource needs identified in the 1990 and 1992 Resource Programs, BPA identified a management strategy for matching power supply with demand over the next two decades. The strategy is referred to as the "emphasize conservation alternative." This strategy is one of thirteen alternative strategies that BPA developed to meet a projected power deficit of 2,000 to 2,500 aMW in the year 2000.

Under the "emphasize conservation alternative," BPA is committed to acquiring all cost-effective conservation and system efficiency improvements. This action is expected to save BPA 477 average megawatts (aMW) and 134 aMW respectively. The next resource priorities of this preferred alternative are renewables and cogeneration resources which BPA expects to acquire 105 aMW and 260 aMW respectively. As part of this strategy, BPA will also rely on gas-fired combustion turbines for up to 1,040 aMW.

Every two years, BPA develops a resource program that explains how BPA proposes to meet its expected load obligations. In developing the resource program, BPA prepares load forecasts jointly with the Council. A range of forecasts is prepared to reflect uncertainties about the future load growth. Next, a range of load resource balances is prepared by comparing the capability of the existing Federal system resources to the range of projected Federal system loads over the next 20 years. Concurrent with the process, BPA and the Council develop new resource supply forecasts to plan acquisitions of cost effective resources as they are needed to meet load growth. Under this approach, resources other than the proposed action will be examined and evaluated in the future for their eligibility and ability to satisfy BPA's future needs.

2.0 PROJECT DESCRIPTION —HERMISTON

2.1 Site Location

The proposed Hermiston Power Project would be located 4.8 kilometers (km) (3 miles) south of Hermiston, Oregon, in an industrial area adjacent to the currently operating J.R. Simplot Potato Processing Plant (see Figure 2-1). The legal description of the site is the southeast quarter of the southeast quarter of Section 28, Township 4 North, Range 28 East of the Willamette Meridian in Umatilla County, Oregon. The proposed location for the cogeneration facility is a 6.9-hectare (ha) (17-acre) site in an area currently used for alfalfa production; historical uses were also agricultural. The property is currently owned by the J.R. Simplot Company, and the Hermiston Power Partnership (consisting of wholly owned subsidiaries of Ida-West Energy Company, J.R. Simplot Company, and TransCanada Pipelines, Limited) has an option to lease the site. Most of the cogeneration facility site is surrounded by agricultural land, much of which is owned by Simplot. The site is approximately 0.8 km (0.5 mile) from the nearest residence.

In addition to producing electricity from natural gas combustion and steam generation, the facility would provide steam from waste heat for the J.R. Simplot potato plant for processing operations. The existing Simplot plant boilers would normally be shut down and placed on stand-by when the cogeneration facility was operating.

2.2 Project Components

Major project components would include:

- two identical side-by-side combustion turbine generators/two heat recovery steam generators (HRSGs)/two steam turbine generators, capable of producing an average of 430 megawatts (MW).
- Natural gas supply pipeline interconnections with nearby Northwest Pipeline Corporation (NWP) (30-centimeter [cm] [12-inch] diameter; 4.8-km [3-mile] length) and Pacific Gas Transmission (PGT) (30-cm [12-inch] diameter; 7-km [4.25-mile] length) laterals.
- A back-up fuel supply of No. 2 fuel oil stored in two 3.8 million liter (l) (1 million gallon) on-site fuel tanks.
- A process water supply line (25- or 30-cm [10- or 12-inch] diameter; 2.01 km [1.25-mile] length) connecting to the Port of Umatilla-City of Hermiston regional water system at the planned treatment plant north of the Feedville Road.
- A wastewater treatment line (15.2-cm [6-inch] diameter; 914.4-meter (m) [3,000-foot] length) connecting to the existing J.R. Simplot land disposal system adjacent to the proposed facility site.
- Cooling system.
- Electrical interconnection to the existing Bonneville Power Administration (BPA) McNary Substation and substation modifications. The distance to the substation is approximately 14.5 km (9 miles).

The proposed cogeneration facility layout is depicted in Figure 2-2, with project components summarized below.

2.2.1 Cogeneration Facility

The project developers, the Hermiston Power Partnership, are proposing a combined-cycle combustion turbine cogeneration facility containing (1) two natural gas-fired combustion turbines, each coupled on a single shaft with a steam turbine and a common generator; (2) two HRSGs; (3) two steam surface condensers; and (4) two condenser cooling systems. The hot exhaust from each combustion turbine would flow directly to an HRSG, where the heat would be captured to create output steam to power a steam turbine generator. Combining the electrical outputs of the gas-fired combustion turbines and the steam turbines, the facility would generate 430 average megawatts (aMW) (enough electricity to supply 250,000 homes in the Pacific Northwest). Additional low-level heat is recovered in the plant (as compared to a stand-alone power plant) by providing steam (up to 54,530 kilograms [kg]/hour [120,000 pounds/hour]) to the J.R. Simplot potato processing plant. A conceptual diagram illustrating the cogeneration process is presented in Figure 2-3.

The majority of the facility's equipment, including the turbine generators, would be located in a steel building covering approximately 5,575 square m (60,000 square feet). Separate rooms in the building would contain the electrical switches and plant controls. Equipment located outside the building would be two 59.4-m (195-foot) exhaust stacks, cooling towers, HRSGs, electrical substation, and storage tanks for water, back-up fuel oil, and chemicals.

2.2.2 Fuel Supply

The cogeneration facility's primary fuel would be natural gas. Current plans are to have gas supplied from both NWP and PGT (Figure 2-1). The connection to the NWP lateral approximately 13 km (8 miles) to the east, would require a new 30-cm (12-inch) pipeline. The NWP route would share ROW with the Eastern 500-kV Alternative between the cogeneration facility and Canal Road to the east. The route would then continue eastward along the south side of Feedville Road to a point a short distance to the east of South Edward Road. At this point the route would turn toward the northeast and continue along an old dirt road for approximately 4.8 km (3 miles) connecting to the existing NWP lateral (Figure 2-1).

The connection to the PGT line, also to the east, would require 6.4 km (4 miles) of new 30-cm (12-inch) pipeline. The route would run north from the cogeneration facility for approximately 0.4 km (0.25 mile) to the south side of the Union Pacific Railroad Hinkle Yard. The route then would turn to the east and run along the south side of the railroad tracks; paralleling a paved and dirt railroad access road for approximately 5 km (3 miles). The route would then turn to the southeast for approximately 1.6 km (1 mile) and connect with the PGT lateral (Figure 2-1).

In the event of a disruption in the natural gas supply, the project would be designed to burn No. 2 fuel oil. Two 3.8 million l (1 million gallon) fuel tanks, enclosed by a containment system in case of a spill, would be constructed for the project. The containment system would be designed to handle the contents of the one tank plus precipitation from the largest storm recorded for the area as required by regulations. The tanks would supply enough fuel for approximately 4 days of operation. Replacement fuel oil would be brought in by rail car using the potato plant's existing siding.

2.2.3 Electrical Interconnection and Substation Modifications

Electricity generated by the Hermiston Power Project would be transmitted to BPA's McNary Substation, approximately 14.5 km (9 miles) north of the proposed cogeneration facility site.

Two alternatives are being considered for conveying electrical power to the McNary Substation: the Western 230-kilovolt (kV) Alternative and the Eastern 500-kV Alternative. The routes are depicted in Figure 2-1. These alternative routes are described below, together with the modifications required at the McNary Substation to accommodate the new power source.

Western 230-kV Alternative

This alternative involves using, for the most part, an existing Umatilla Electric Cooperative Association (UECA) 115-kV transmission line corridor between the Westland and the McNary substations. The right-of-way (ROW) generally runs parallel to the eastern boundary of the Umatilla Ordnance Depot from the Westland Substation at the Lamb-Weston potato plant north to the city of Umatilla, then east and north to the McNary Substation (Figure 2-1).

This section of ROW was permitted by the Hermiston Generating Project for construction as steel pole double circuit 230/230-kV transmission line to be completed by the end of 1995. The construction includes demolition of the existing UECA structures and transfer of the existing 115-kV UECA conductors to the new structure. The line, although permitted as a 230-kV/230-kV and constructed to provide this capability, will be operated at 230-kV/115-kV until the proposed project is constructed.

If the Western 230-kV Alternative is chosen for the proposed project, the UECA 115-kV line would be relocated to a new wood pole transmission line (UECA 115-kV relocation) to be constructed along the county ROW. The required 230-kV conductor and insulators would then take the UECA position on the 230/230-kV transmission line, along with the Hermiston Generating Project, between the Westland and McNary substations.

The proposed cogeneration facility would be connected to the 230/230-kV transmission at the Westland Substation by constructing approximately 2.4 km (1.5 miles) of new 230-kV line from the cogeneration facility west to State Highway 207 and then north to Feedville Road. The remaining portion would involve the construction of additional 230-kV conductor and insulators on an existing UECA 115-kV line from the intersection of State Highway 207 and Feedville Road to the Westland Substation at the Lamb-Weston potato plant. This section would involve a crossing of the Umatilla River (Figure 2-1).

Typical pole/conductor configurations for the different portions of the proposed transmission lines are shown in Figures 2-4, 2-5, 2-6, and 2-7.

Eastern 500-kV Alternative

If this alternative is chosen, a new 500-kV transmission line (to be owned and operated by BPA) would be constructed between the cogeneration facility site and the McNary Substation. From the McNary Substation south for a distance of approximately 1.4 km (0.9 miles), the project would use the existing BPA 500-kV McNary-Lower Monumental transmission line's structures. This would require that the existing BPA 500-kV McNary-Lower Monumental circuit, through this section only, be relocated to the county road ROW. The relocated BPA line would be approximately 1.6 km (1 mile) in length and would occupy new steel poles or towers along County Road 1231, approximately 200 m (656 feet) east of its present position. The required Hermiston Power Project conductors and insulators would then take the present position of the BPA McNary-Lower Monumental circuit on the existing transmission line structures. At the southern end of this line segment, a new 500-kV line would depart from the McNary-Lower Monumental corridor and continue south and slightly west along a new route for a distance of approximately 0.4 km (0.2 mile), at which point the line would join the existing BPA 230-kV McNary-Roundup corridor.

From its entrance to the BPA McNary-Roundup corridor, the Hermiston Power Project 500-KV transmission line would require construction of a 12.2 km (7.6 mile) section of line to be located within the existing 76.2-m (250-foot) wide BPA McNary-Roundup corridor. The new 500-kV transmission line would occupy the corridor with BPA's 230-kV McNary-Roundup Line No. 1 and would consist of steel towers or poles constructed at 304.8- or 365.8-m (1,000- or 1,200-foot) intervals along the eastern one-half of the ROW. This section continues until the intersection of the BPA McNary-Roundup corridor with Canal Road.

At Canal Road, the Hermiston Power Project 500-kV line would continue south along Canal Road on single-shaft steel poles approximately 1.4 km (0.9 mile) to the intersection with Feedville Road. Pole placement will be along county road ROW. At Feedville Road the line continues west approximately 5.1 km (3.2 miles) along the south side of Feedville Road. Approximately 0.2 m (0.1 mile) west of the intersection of Feedville and Hermiston-Hinkel roads, the line would continue south and slightly west to the cogeneration facility. The 500-kV transmission line would parallel and use a common ROW corridor with the proposed NWP gas line route between the cogeneration facility and Canal Road (Figure 2-1).

Typical pole/conductor and tower/conductor configurations for the proposed 500-kV transmission line are shown in Figures 2-8 and 2-9.

McNary Substation Modifications

Modifications within the existing substation would be designed and constructed by BPA to accommodate the new power source. These would likely include either new 230-kV or 500-kV ring buses, breakers, meters, protective relays, and disconnect switches.

2.2.4 Water Supply and Wastewater Systems

Process and boiler make-up water for the cogeneration facility would be purchased from the Port of Umatilla-City of Hermiston (Port) regional water system, which would draw water from the Columbia River under its existing water permit 49497, with a priority date of January 19, 1979. The permit allows the Port to withdraw up to 4.4 cubic meters per second (cms) (155 cubic feet per second [cfs]) (263,328 liters per minute [lpm] [69,564 gallons per minute {gpm}]) of water from the Columbia River. The Port's initial withdrawal of 1.8 cms (62 cfs) (105,333 lpm [27,826 gpm]) at this station would constitute approximately 0.036 percent of the Columbia River volume. The Port began construction of the water supply facilities in November 1994. The Port's facilities are being constructed independently of the proposed project, and would supply water to a number of municipal and industrial users including the city of Hermiston.

The proposed project would require an average of 7,359 lpm (1,885 gpm) of process water. The project will connect to the Port's raw water supply system near the Port's water treatment plant, at the intersection of Feedville Road and State Highway 207 using a 25- or 30-cm (10- or 12-inch) diameter, 2.01-km (1.25-mile) long underground feeder pipeline. The pipeline would parallel State Highway 207 (Figure 2-1). All necessary water treatment will occur on the cogeneration facility site. The project's potable water would be obtained from the J.R. Simplot Company potato processing plant adjacent to the cogeneration facility site.

Stormwater from the cogeneration facility site would be collected by a system of drainage ditches and transported to a detention basin located in the northwest corner of the site. A segregated drain system will be provided for the turbines, HRSGs, water treatment and service areas to allow any chemicals or oils containing wastewater to be processed separately.

The cogeneration facility will produce an average of 553 lpm (146 gpm) of process wastewater, including cooling tower blowdown. This wastewater would be collected and routed 914.4 m (3,000 feet) through a 15.2-cm (6-inch) diameter pipe to the Simplot potato plant land application system. Under an existing Oregon Department of Environmental Quality (ODEQ) Water Pollution Control Facilities (WCPF) permit, Simplot currently recycles its process water on farm land in the vicinity of their plant site. This permit will be amended to allow the proposed project's process wastewater to be land applied with the land of the potato plant.

Sanitary wastewater from the cogeneration plant is proposed to discharge to the J.R. Simplot existing sanitary wastewater treatment system. Simplot's existing sanitary system consists of a two-cell faculative lagoon/evaporation unit, chlorinator, and agricultural irrigation system. An amendment to the existing Simplot WPCF permit is also being sought to allow cogeneration sanitary wastewater to be added to Simplot's existing system.

2.3 Operating Schedule

The cogeneration facility would operate as directed by the BPA dispatcher. The facility would be designed to be taken off line or run at reduced rates as needed to support BPA electrical load requirements. To minimize BPA generation costs, the plant could be shut down when adequate lower cost hydroelectric power is available. The plant could be operated at between 60 to 100 percent of rated output to allow BPA to firm its hydroelectric system and match capacity loads. The plant's operating schedule would change seasonally and daily depending largely on the availability of water for hydroelectric generation and changes in hydroelectric system operations made to enhance fish passage. For purposes of this environmental impact statement (EIS), environmental impacts from the proposed project are evaluated on the basis of operating scenarios that produce worst-case air emissions and effluent water quality.

2.4 Construction Schedule

Construction of the project could begin between 1995 and 2000, depending on BPA's need for electricity. Once BPA gives the approval for facility construction, the project could be completed in approximately 2 years. Site preparation would require conventional construction equipment, including bulldozers, front-end loaders, trucks, tractor-scrapers, and graders. After site preparation, the combustion turbines, generators, electrical and other equipment, and support facilities of the cogeneration facility would be installed. Once these facilities are in place, the site landscaping would be initiated. Pipeline construction would take approximately 12 months (within the overall 24-month period).

For the Western 230-kV Alternative, the construction period required would be 12 months for the 230-kV construction between the cogeneration facility site and McNary Substation. Approximately 6 months of construction would be required for the relocation of the UECA 115-kV circuit to the county road ROW. These two construction periods would run concurrently.

The Eastern 500-kV Alternative, for the most part, would be routed along county road ROWs to a point where the line would join the BPA McNary-Roundup 230-kV transmission corridor to the McNary Substation. The line would require 10 to 12 months for construction.

All transmission line construction periods described above would occur during the overall project 24-month construction period.

2.5 Decommissioning

The Hermiston Power Project would have a life expectancy of 30 to 40 years. If the proposed power plant were to reach the end of its useful life, it would be renovated or decommissioned. If the power plant were decommissioned, all structures and equipment at the power plant site would be dismantled and sold. Transmission interconnection lines and structures would be deeded to the impacted utilities to continue to serve the area. The McNary Substation would most likely not be decommissioned at the same time and would continue to serve the area. Gas and water line connections would be capped and abandoned or removed.

3.0 AFFECTED ENVIRONMENT —HERMISTON

3.1 Geology, Soils, and Floodplains

3.1.1 Regional Geology

The proposed project is in the central portion of the Columbia Plateau physiographic province that extends across northeastern Oregon, southwestern Washington, and western Idaho. The geology of the Hermiston area is shown in Figure 3.1-1. The Columbia Plateau is composed of a thick sequence of flood basalts, named the Columbia River Basalt Group (CRBG), that erupted from 17 to 6 million years before present (m.y.BP). These flood basalts cover an area of approximately 163,170 square km (63,000 square miles) and are up to 3,657.6 m (12,000 feet) thick in the central portion of the plateau. The CRBG consists of hundreds of individual basalt flows that have been segregated, based on chemical composition, age, and aerial extent, into three major groups: the Saddle Mountains Basalt, the Wanapum Basalt, and the Grande Ronde Basalt (Galster and Coombs 1989). In the project vicinity, the Saddle Mountains Basalt is exposed in nearby hills and buttes. Further subdivisions within the Saddle Mountains Basalt include, from oldest to youngest, the Umatilla Member, the Pomona Member, and the Elephant Mountain Member, all of which appear in the vicinity of the cogeneration facility site. The basalts erupted from feeder dikes injected into north-northwest trending linear fracture zones.

The Columbia Plateau contains a complex system of folds, faults, and basins (Figure 3.1-2). Based on the predominant structural fabric, the Columbia Plateau has been subdivided into three informal structural subprovinces: Palouse Slope, Blue Mountains, and Yakima Fold Belt. The proposed project is situated within the Yakima Fold Belt of the Columbia Plateau, characterized by narrow, asymmetrical anticlines spaced between 4.8 to 48.3 km (3 to 30 miles) apart, separated by broad, low valleys. The anticlines include the Service anticline, 1.6 km (1 mile) east of the cogeneration facility site; The Dalles-Umatilla syncline, 12.9 km (8 miles) northeast of the site; and the Columbia Hills anticline, 17.7 km (11 miles) north of the site. The Rattlesnake-Wallula alignment, located 48.3 km (30 miles) northeast of the cogeneration facility site, is a broadly defined zone of faulting and tectonic deformation. It is a segment of the larger Olympic-Wallowa Lineament (OWL) that extends from northwestern Washington to southwestern Idaho.

The Columbia Plateau includes a number of identified tectonic basins, one of which is the Umatilla Basin, where the project is located. These basins are subsidence features that developed during emplacement of the CRBG. They are associated with dramatic thickening of the basalt and with an infilling of sedimentary deposits. The Umatilla Basin is similar to other basins in the region. These basins appear to have continued to subside since basaltic volcanism stopped about 6 m.y.BP (Reidel et al. 1989)

3.1.2 Project Vicinity Geology

The project is situated in the Umatilla Lowlands, an area characterized by relatively flat to gently rolling terrain that gradually descends from the Blue Mountains to the Columbia River. The surface topography generally mimics the buried surface of the CRBG. The area is drained by the Umatilla River and its tributaries. Elevation within the project vicinity ranges from approximately 219 m (720 feet) above mean sea level (msl) along the proposed NWP Gas Line route to about 91.4 m (300 feet) msl at the McNary Substation.

The nearly horizontal basalt flows (CRBG) in this area are blanketed by up to 61 m (200 feet) of unconsolidated to poorly consolidated, Pleistocene (0.01 to 2 m.y.BP), glacial outwash, and catastrophic flood deposits (map symbol Qs [Figure 3.1-1]; Hogenson 1964, Swanson et al. 1981). These deposits accumulated during glaciation, when major tributaries of the Columbia River were dammed by ice, forming large lakes. These ice dams eventually breached, sending catastrophic floods across the Columbia Plateau through the gorge to the Pacific Ocean. Geologic mapping of these deposits indicates that lake levels and flood crest rose to a maximum elevation of approximately 350.5 m (1,150 feet) msl in the Umatilla Lowlands area. The floods completely stripped any existing overburden material and scoured the surface of the CRBG, forming a scabland topography (elevated, flat-lying basalt flows, with a thin soil cover, sparse vegetation, and deep, dry channels). The flood and outwash deposits accumulated on the CRBG are crudely stratified clean sand and gravel with occasional boulders and silt lenses. The flood deposits are covered by wind-deposited silt (loess). The silt is loose and typically several feet thick.

Cogeneration Facility Site

At the cogeneration facility site, four distinct subsurface materials are present (Squier Associates 1994). The upper 2.4 to 3 m (8 to 10 feet) consists of loose fine sand with some silt, and silty fine sand (Figure 3.1-3). This deposit is interpreted as loess, a wind-blown deposit. Underlying the loess is 16.8 to 18.2 m (55 to 60 feet) of more dense sand with some silt, grading to very dense gravel. The silt content generally decreases with depth. This unit is interpreted as a set of flood deposits, which is consistent with published information about subsurface geologic conditions in the area (Hogenson 1964, Swanson et al. 1981). The gravel layer extends to approximately 61 m (200 feet), where it is underlain by basalt. Nearby wells have encountered basalt of the CRBG at 44.2, 36.6 and 39.6 m (145, 120 and 130 feet), indicating that the surface of the basalt is gently undulating. Geotechnical explorations at the cogeneration facility site have not extended to the depth of anticipated groundwater. Groundwater monitoring wells and water production wells in the area of the cogeneration facility allow interpretation of the groundwater conditions beneath the site (Figure 3.1-3). The static water level was measured at 35.1 m (115 feet). The lower aquifer is in the basalt and is confined.

Water Supply, Gas, and Electrical Transmission Lines

Subsurface geology of the water supply line, gas pipeline, and electrical transmission line routes is believed to be similar, with a sheet of loess being at the surface in most areas. In some areas, flood deposits are at the surface, and the CRBG crops out in scattered locations along the Service anticline and at the Columbia River.

3.1.3 Geologic Hazards

Landslides

Landslides or other forms of mass wasting are unlikely to occur near project components or along the ROWs. The proposed cogeneration facility is on gentle topography with slopes less than 5 percent. The site is located on a terrace north of and 18.2 m (60 feet) above the Umatilla River. The slope between the terrace and the river is gentle (about 10 percent) and presents virtually no hazard of slumping or earthflow. In addition, the water table is about 35.4 m (115 feet) below the surface. Under these circumstances, the initiation of landslides is extremely unlikely. The gas pipeline routes are also very gentle and pose no threat of landslide initiation.

No landslides or other evidence of instability occur along the electrical transmission line routes, except in the vicinity of active rock quarries near Umatilla. The gas pipeline route crosses areas of low risk instability. No landslides are present within or near the proposed gas pipeline or transmission line routes.

Volcanic Activity

The project vicinity is a volcanically quiescent area. The last of the flood basalts that comprise the CRBG erupted 6 million years ago. There are no Quaternary age flows or cinder cones within the project vicinity, although 160.9 km (100 miles) to the west lies the High Cascade Range, a chain of stratovolcanoes active during the Pleistocene and

Holocene.

Erosion

The Umatilla River, in the vicinity of the project, has active meanders. A small section of one of these meanders (about 91 m [300 feet]) was observed to be actively eroding during a site visit in October 1993.

Earthquakes

The project lies within the seismically active Columbia Plateau. As illustrated on the earthquake epicenter map (Figure 3.1-4), numerous earthquakes have occurred within the region. The strongest historical earthquake known to have occurred within the Columbia Plateau occurred on July 16, 1936 in the Milton-Freewater area, at a Richter magnitude of 5.8 (Jacobson 1986). The event had a Modified Mercalli Intensity (MMI) of VII-VIII. This earthquake caused surface rupture and possibly liquefaction.

An earthquake centered near Umatilla on March 3, 1893 had a MMI of VII (estimated Richter magnitude of 5.7; Jacobson 1986). However, the Umatilla earthquake was likely a relatively small earthquake on the order of Richter magnitude 4.5 that occurred at a very shallow depth (less than 3.2 km [2 miles]) (letter to Patrick Plumley of Riverside Technology, seismologist, Boise State University, from Zollweg, November 20, 1992). This is supported by the fact that the Umatilla earthquake was felt over a very small area. During the summer of 1992, a 3.7 Richter magnitude earthquake was recorded in the Hermiston-Umatilla area and a 4.2 magnitude earthquake occurred in the Milton-Freewater area (letter to P. Plumley, Riverside Technology Geologist, U.S. Geological Survey [USGS], from G. Mann, November 24, 1992).

Pertinent faults within a 100-km (62.1-mile) radius of the cogeneration facility site, and their estimated maximum credible earthquakes (MCE) and corresponding peak ground accelerations (PGAs) are summarized in Table 3.1-1. The values in Table 3.1-1 represent the most recent quantitative estimates of seismic risk for the region. The MCE for the site corresponds to a 5.5 Richter magnitude event occurring in the Umatilla Basin, conservatively estimated to occur at the cogeneration facility site. The estimated PGA for the site is 0.25 times gravity (g). A 5.5 Richter magnitude event at or near the site, or centered on the Service anticline 1.6 km (1 mile) east of the site, would produce an estimated PGA of 0.45 to 0.5 g.

Table 3.1-1. Estimated Maximum Credible Earthquakes and Peak Ground Accelerations for Significant Faults and Structures in the Region

Fault or Structure	Distance from Cogeneration Site (km	MCE	PGA (gravity) Corresponding to MCE	Recurrence Intervals
Service Anticline	1.6 (1)	5.5	0.45 to 0.5	N/A
Toppenish Ridge Fault	97 (60)	7.3	0.08 0.09	1,000s to 10,000s of years
Wallula-Rattlesnake Alignment	48 (30)	6.4 6.5	0.06 0.09	200 to 1,000 years
Gable Mountain	97 (60)	5.9 5.0	<0.05 <0.05	10,000 years
Umatilla Basin	10.0 (6)	5.5	0.15	N/A

Source:
Riverside Technology, Inc. 1993
Squier Associates 1994 (Exhibit G)

Groundwater levels are important in evaluating potential seismic hazard because shallow groundwater in unconsolidated, sandy material can contribute to liquefaction potential. No groundwater was encountered in the upper 30 m (100 feet) at the site (Squier Associates 1994), and nearby wells indicate a depth to groundwater of about 185.1 m (607 feet).

3.1.4 Soils

Eleven soil types occur along the water supply line, transmission line routes, gas line routes, and at the cogeneration facility site. Table 3.1-2 lists the acreages and relevant characteristics of each soil type for project components. Of particular note is the Adkins fine sandy loam, which at 0 to 5 percent slopes is considered prime farmland (SCS 1988). The cogeneration facility site is partially underlain by this soil. More detailed descriptions of the soil types can be found in the Umatilla County Soil Survey. In addition, parts of both transmission line route alternatives, the waterline route and the NWP gas transmission line route are underlain by this soil.

3.1.5 Floodplains

The proposed cogeneration facility site lies on a terrace at least 24 vertical m (80 vertical feet) above the banks of the Umatilla River. As shown in Figure 3.1-5, the facility site lies outside the 100-year floodplain determined by the Federal Emergency Management Agency (FEMA). There are no other significant drainages nearby. Although the NWP gas line would not cross any designated floodplains, the PGT gas line would cross the Umatilla River floodplain.

The Western 230-Kv Alternative crosses the floodplain of the Umatilla River in two locations. One crossing is where the proposed 230-kV conductor would be added to the existing UECA 115-kV line from Feedville Road, across the river to the Westland Substation. The other crossing occurs where the proposed relocated UECA 115-kV line crosses the river just west of I-82 (Figure 3.1-5). Each of these crossings would involve 0.19 ha (0.46 acre) of floodplain based on an assumed 15.24-m (50-foot) ROW. All alternative routes for these actions required for the Western 230-kV Alternative would also involve similar crossings of the Umatilla River floodplain.

A maximum of 28.65 ha (70.8 acres) and a minimum of 60.1 ha (15.0 acres) would be affected by the project, depending on which route alternatives are selected.

3.2 Water Resources

3.2.1 Water Availability

Surface Water

Surface water resources in the project vicinity include the Columbia and Umatilla rivers. The site of the proposed cogeneration facility lies within the Umatilla Plateau hydrologic sub-basin of the Umatilla River, on an escarpment 24 m (80 feet) above and 400 m (0.25 mile) north of the river. The Umatilla River meets the Columbia River at the city of Umatilla, about 14.5 km (9 miles) north of the facility site.

The project vicinity is in the rain shadow of the Cascade Mountains and therefore is arid, with slightly less than 23 cm (9 inches) of precipitation annually. Most precipitation in the region falls between October and April. Because no creeks run through the cogeneration facility site, any runoff would drain overland toward the northwest, then west and eventually south to the Umatilla River along State Highway 207. Because of the permeable nature of the soils, runoff from the site would be rare.

The Umatilla River Basin Plan (State of Oregon 1988), which regulates and guides future water development in the basin, prohibits further withdrawal of water from the Umatilla River and its tributaries in the Umatilla Plateau sub-basin from June 1 through October 31 (Oregon Administrative Record [OAR] Chapter 690, Division 507). Under the Umatilla River Basin Plan, the Umatilla River in the project vicinity is designated for numerous uses excluding large-scale irrigation and power production.

The Columbia River is the region's dominant surface water feature. The Columbia River has an average regulated discharge of approximately 4,808 cms (169,800 cfs) (288,490,384 lpm [76,211,334 gpm]) at McNary Dam, which is about 14.5 km (9 miles) north of the cogeneration facility site. Discharges at McNary Dam vary from about 6,796 to 7,929 cms (240,000 to 280,000 cfs) (407,760,260 to 475,720,303 lpm [107,719,200 to 125,672,400 gpm]) in the high flow period (April through June) to about 3,030 to 3,228 cms (107,000 to 114,000 cfs) (181,793,116 to 193,686,123 lpm [48,024,810 to 51,166,620 gpm]) during the low flow months (August through November). Annual variations also occur, depending on precipitation and snowmelt in the drainage basin. Extreme flows on the Columbia River are moderated by the numerous dams and reservoirs on the river.

The Columbia River provides water for many uses, including irrigation, navigation, hydropower, flood control, recreation, municipal and industrial water supply, and fish and wildlife use. Three Federal agencies, including BPA, the U.S. Army Corps of Engineers (Corps), and the Bureau of Reclamation, are currently undertaking a major review of the river and its management in an attempt to reconcile all of the competing uses. Additionally, although existing water rights are being honored, Oregon and Washington each has a current moratorium on granting new water rights on the Columbia River except under certain limited conditions (OAR Chapter 690, Division 519; Washington Administrative Code [WAC] 173-563-015[2]).

<u>Groundwater</u>

The project vicinity is underlain by two groundwater aquifers; a deep aquifer and a shallow aquifer. In general, groundwater elevations indicate that groundwater flow is from south to north, toward the Columbia River.

The shallow aquifer in the project vicinity is located in the unconsolidated and unconfined sand and gravel deposits that overlie the basalt bedrock in the region. Permeable gravel interbeds supply water to several high-yielding wells. The aquifer is 30.5 to 38.1 m (100 to 125 feet) thick, with a saturated zone averaging 7.6 m (25 feet) and ranging from 4.6 to 38.1 m (15 to 125 feet) thick. Water levels in this aquifer were 16.8 m (55 feet) below the ground surface in 1975, and have been dropping by about 0.5 m (1.6 feet) per year since the mid-1960s.

The proposed cogeneration facility site is located in the Stage Gulch Ground Water Control Area (GWCA), as designated by the Umatilla Basin Plan. This area abuts the Butter Creek GWCA. Local and regional groundwater aquifers in this area are frequently used to supplement surface water supplies for irrigation. This has led to overdrafting of groundwater aquifers. Irrigators are now attempting to recharge shallow aquifers and increase soil moisture with surface water diverted during the winter.

The deep aquifer in the project vicinity is located in the basalt flows that lie beneath sedimentary deposits in the region. Groundwater recharge of this aquifer occurs in the Blue Mountains to the south, while natural groundwater discharge is to the Columbia River and its tributaries. Recharge in the project vicinity is limited by the Willow Creek monocline, a geologic feature south of the Madison Ranches that acts as a barrier to groundwater flow from the south. Groundwater resources in the basalt aquifer in both the Stage Gulch Critical Groundwater Area and the Butter Creek Critical Groundwater Area are closed to further appropriation.

3.2.2 Water Quality

Surface Water

Except for the Columbia River, surface water quality in the lower Umatilla River Basin often does not meet standards for contact recreation and aquatic life, with non-point source pollution being the major contributor to lower water quality.

The water quality of the Columbia River, however, is generally considered good. The state of Washington classifies this reach of the Columbia River as Class A (Excellent), which is the second highest rating for surface water (WAC 173-201A), and includes water quality suitable for potable supply.

Groundwater

Table 3.2-1 presents a summary of worst-case water quality observed at five vicinity wells from January 1989 to April 1993 for water level, nitrate, conductivity, and total dissolved solids (TDS).

Table 3.2-1. Worst-Case Groundwater Quality

Well	Water Level		NO3 - N		Electrical Conductivity		TDS	
	Min.1	Date	Max.2	Date	Max3	Date	Max4	Date
MW-11S	499.65	10/5/92	18.0	4/4/91	630	4/26/90	518	4/14/93
MW-11D	479.33	10/5/92	1.0	7/26/89 1/10/90?	280	10/11/89	230	2/7/93
MW-13S	499.21	4/4/91	31.0	1/13/92	1,000	7/10/91	792	7/10/93
MW-18	538.02	10/6/92	18.6	7/3/91	1,440	1/8/90	1,034	7/3/93
MW-19	537.44	7/6/92	0.7	7/9/91	400	7/9/91	264	10/6/92
MW-20	537.93	10/6/92	43.3	9/7/90	2,730	7/27/89	1,130	7/9/91

Source: EMCON 1992 as cited in CES 1994
1 Static water level, feet msl.
2 Nitrates in milligrams per liter (mg/l) units.
3 Electrical Conductivity in mmhos/cm units.
4 TDSs in mg/l units.

TDS levels in the groundwater approach or exceed the state's drinking water maximum contaminant levels (MCLs). High nitrate levels measured in the shallow wells near the cogeneration facility site exceed U.S. Environmental Protection Agency (EPA) drinking water standards. Maximum nitrate levels were observed during the winter, spring, and summer.

3.3 Air Quality

3.3.1 Existing Air Emission Sources

Emissions from existing sources largely determine the air quality of the project vicinity. Within 50 km (31 miles) of the cogeneration facility site there are only a few major sources of emissions, mostly in the Umatilla and Pendleton areas. The ODEQ provides estimates of total annual emissions for regulated pollutants by county. Annual air emissions for Umatilla County are provided in Table 3.3-1. In Umatilla County, the major sources of air emission are vehicles and area sources such as agricultural activities. Point sources include the existing Pacific Gas and Electric (PGE) Boardman coal-fired plant.

Table 3.3-1. Air Emissions in Umatilla County

Pollutant	Air Emissions MTY (TPY)[1]		
	Area and Mobile Sources	**Point Sources**	**All Sources**
PM_{10}	13,023 (14,355)	86 (95)	13,109 (14,450)
SO_x	1,276 (1,406)	104 (115)	1,379 (1,521)
NO_x	5,296 (5,838)	372 (410)	5,668 (6,248)
CO	26,354 (29,050)	138 (152)	26,491 (29,202)
VOC	5,616 (6,191)	119 (197)	5,795 (6,388)

Source: ODEQ 1993a
[1] MTY = Metric tons per year (TPY = Tons per year)

Table 3.3-2.Monthly Total Precipitation and Average Temperature Monitored at Hermiston, Oregon

Month	Total Precipitation cm (inch)	Average Temperature °C (°F)
January	3.4 (1.35)	0.0 (32.0)
February	2.1 (0.82)	3.8 (38.9)
March	1.8 (0.71)	7.1 (44.7)
April	1.6 (0.62)	10.9 (51.6)
May	1.7 (0.68)	15.4 (59.8)
June	1.2 (0.48)	19.7 (67.4)

July	0.5 (0.19)	23.2 (73.8)
August	1.0 (0.39)	22.2 (71.9)
September	1.09 (0.39)	17.6 (63.7)
October	1.8 (0.71)	11.2 (52.1)
November	3.0 (1.19)	4.8 (40.6)
December	3.4 (1.34)	1.7 (35.0)
Annual	22.5 (8.87)	11.5 (52.7)

Source: National Oceanic and Atmospheric Administration (NOAA) 1990

3.3.2 Meteorology and Climate

Dispersion of emitted air pollutants is governed by wind direction, wind speed, temperature (which contributes to plume rise), and the turbulence of the lower atmosphere. The climate of the project vicinity is dominated by the presence of the Cascade and Blue Mountains and the flow of air from the Pacific Ocean.

The normal flow of air is from the Pacific Ocean, across the Cascades or through the Columbia Gorge, and into the Hermiston area. The Cascade Mountains reduce the amount of precipitation reaching the Columbia Basin. A gradual rise in elevation from the Columbia River to the foothills of the Blue Mountains results in sufficient moisture for agriculture. Lighter summer precipitation totals are augmented by thunderstorms that move into the area from the south or southwest. When the flow of air from the west is impeded by high pressure systems over the continental interior, hot, dry conditions develop. The coldest winter temperatures occur during outbreaks of cold high pressure systems from central Canada.

During November through January, the average daily maximum and minimum temperatures are 6.4·C (43.5·F) and -1.3·C (29.7·F), respectively. Monthly precipitation totals reach their maximum during November through January, at a little over 2.5 cm (1 inch) per month (Table 3.3-2). Daily precipitation totals of at least 0.025 cm (0.01 inch) can be expected on about 12 days per month during this period. Heavy fog, with visibilities less than 0.4 km (0.25 mile), occur frequently during this period.

The average daily maximum and minimum temperatures during June through August are 29.3·C (84.8·F) and 13.5·C (56.3·F), respectively. Monthly precipitation totals reach their minimum during this period, averaging about 0.9 cm (0.35 inch) per month. Most of this precipitation originates from thunderstorms. Thunderstorms can be expected on about 2 days per month during June through August.

3.3.3 Existing Air Quality

The air quality in the Umatilla region achieves all local, state, and national ambient air quality standards (AAQS). Direct information comes from several air pollution monitoring stations operated within 50 km (31 miles) of the cogeneration facility site (Table 3.3-3). The AAQS presented in Table 3.3-3 are the most restrictive of the local, state, or national standards. Some pollutants (sulfur dioxide [SO_2], nitrogen oxide (NO_x), and ozone [O_3]) are not monitored because of the low level of industrialization in the region.

Table 3.3-3. Regional Ambient Air Pollution Concentrations

Pollutant	Averaging Period	Monitoring Station	Concentration[1] (mg/m^3)	Ambient Air Quality Standard (mg/m^3)
PM_{10}	24-hour	Pendleton, OR McKay Creek, OR Walla Walla, WA	57 103 63	150
	Annual	Pendleton, OR McKay Creek, OR Walla Walla, WA	30 34 28	50

Source: Ecology 1993, ODEQ 1993a
[1] Data are from more industrialized areas and probably exceed concentrations in the immediate vicinity of the cogeneration facility site.

Monitoring data in the Hermiston region indicate that ambient air pollution concentrations are less than the AAQS. Umatilla County is in attainment for all criteria air pollutants. The monitoring stations are located near sources of air emissions (Pendleton and Walla Walla) and are, therefore, not representative of air quality at the cogeneration facility site. The air quality in the area surrounding the cogeneration facility site is probably much better than indicated by monitoring data.

Locations where pollutant concentrations are greater than the AAQS are referred to as nonattainment areas. There are no nonattainment areas within 80 km (50 miles) of the cogeneration facility site. However, ODEQ suspects that the Hermiston area may be nonattainment for total suspended particulate matter (TSP) and for particulate matter with aerodynamic diameter of less than 10 microns (PM_{10}). Also the southern portion of Benton and Walla Walla counties in Washington are suspected particulate matter nonattainment areas. ODEQ and the Washington Department of Ecology (Ecology) are studying the nature of the particulate matter in these areas.

3.4 Noise

3.4.1 Noise Measurement and Terminology

Noise is defined as unwanted sound that interferes with the normal activities of humans and natural environment. The Oregon Department of Energy regulates noise levels through the Site Certification process. The noise generated by the project, when added to existing background noise, should not exceed the permissible environmental noise levels (see Section 3.16.4).

Noise is measured in decibels (dB), a logarithmic ratio between pressure caused by a given sound and the standard sound pressure. The human ear is not equally sensitive to all frequencies in the sound spectrum. Thus, it is standard to represent sound levels using the A-weighted scale (dB[A]) corresponding to the range and characteristics most consistent with the way humans perceive sounds. The dB(A) scale is logarithmic; small fluctuations (less than 3 dB[A]) do not always result in direct increases in loudness.

Sound levels at an average residence typically range from 45 to 55 dB(A). Sounds associated with nearby freeway and highway traffic are louder, ranging from 65 to 80 dB(A). Because sounds vary (depending on the type of monitoring equipment and the duration of use), the equivalent average sound level (Leq) is used to represent the acoustical energy equivalent of the fluctuating sound over a specified period of time. Table 3.4-1 presents a sample of common sources of sound and their noise levels.

For time varying noise sources, the statistical sound levels describe how often a given sound level is exceeded during the measurement period. For example, L10 is the noise level exceeded 10 percent of the time. The L90 noise level would be exceeded 90 percent of the time and would represent the background noise level or the lowest ambient noise levels of the noise environment. Identifiable noise sources would be added to the background noise, forming the total noise environment. The Leq is the sound level of a steady non-varying noise which is equivalent in total acoustic energy to the noise level of time varying noise. The Leq represents an average acoustic energy for the measurement.

3.4.2 Ambient Noise Levels

The ambient noise environment was defined by measuring noise levels in the vicinity of the cogeneration facility site. Noise measurements were made using a Bruel and Kjaer 2231 meter, and include an integrating module for statistical calculation of sound levels over the monitoring period. Monitoring was conducted at identified noise sensitive location. Measurements were conducted at the west end of Hinkle Yard, along Feedville Road north of the J.R. Simplot Company property, and at the nearest residence, located on the north side of Umatilla Meadows Road.

Ambient measurements were conducted during a 3-day period in November 1993. The Hinkle Yard L50 and L10 noise levels were 51 and 53 dB(A), respectively. The Feedville Road L50 and L10 noise levels were 56 and 58 dB(A), respectively, which included noise from refrigerated rail cars parked about 152 m (500 feet) from the measuring location. The probable minimum noise levels, L90, were also measured. The minimum daytime and nighttime ±L90 were 41 and 42 dB(A). The ambient nighttime Leq of 55 dB(A) was exceeded twice during the 3-day measurement period. On one occasion, two trucks were passing in sequence on Interstate 84 (I-84). The other condition occurred when wind was blowing through large willow trees.

Ambient sound levels were measured at the nearest residence, located about 730 m (2,400 feet) south of the cogeneration facility site along Umatilla Meadows Road. Table 3.4-2 presents the occurrence of maximum and minimum noise levels at the residence.

Table 3.4-1. Typical Sound Levels

Sound Source	Distance from Source (m [feet])	dB(A)
Soft whisper	5 (16.4)	30
Library	0	40
Normal conversation	1 (3.3)	60
Busy traffic	0	70
Heavy truck	15 (49)	90
Construction noise	3 (10)	110
Jet takeoff	60 (197)	120

Source: Lipscomb and Taylor 1978

3.5 Vegetation and Wetlands

3.5.1 Vegetation

The project lies within the Columbia Plateau physiographic province of Oregon (Orr et al. 1992), within the Pacific Northwest's shrub-steppe vegetation zone (Franklin and Dyrness 1973). This zone is generally characterized by dry, hot summers and cool, moist winters. Natural vegetation consists of shrub-steppe and grassland communities. Much of the project area, however, has been grazed or developed agriculturally since the mid-1800s. Intensive cultivation, overgrazing, and fire suppression have substantially altered the native vegetation, allowing introduced weeds to infest portions of this region (Oetting 1993). Much of the ground is currently being crop-farmed, and now supports alfalfa, potatoes, onions, carrots, melons, and corn (Oetting 1993). Figure 3.5-1 depicts the location of 21 wetlands potentially impacted by the project. Additional information on wetlands associated with the project can be found in Exhibit H of the Hermiston Power Partnership's Application for Site Certificate dated November 30, 1994, and in the Wetland Delineation Report for the project completed by Northwest Wildlife Surveys dated March 15, 1995. Plant communities potentially affected by the project are discussed below in relation to the project components that would affect them.

Table 3.4-2. Occurrence of Maximum and Minimum Noise Levels at the Nearest Residential Receptor

Sound Level Parameter	Time	dB(A)
L_{90} Maximum Minimum	7:00 am 12:00 pm	62.3 40.3
L_{50} Maximum Minimum	7:00 am 1:00 pm	64.8 44.3
L_{10} Maximum Minimum	8:00 am 2:00 am	70.8 46.3
L_{eq} Maximum Minimum	8:00 am 4:00 am	66.3 44.1

Source: CH2M HILL 1994

Cogeneration Facility Site

The proposed site of the cogeneration facility is a cultivated field currently used to produce alfalfa hay.

Gas Pipeline Routes

Construction of both gas pipelines will potentially affect six different vegetated and open-water habitats. These are briefly discussed below.

Shrub-steppe Vegetation. Shrub-steppe vegetation is a shrub- and grass-dominated, drought-tolerant plant association. Common shrub associates include big sagebrush (*Artemesia tridentata*), green rabbitbrush (*Chrysothamnus viscidiflorus*), bitterbrush (*Purshia tridentata*), and gray rabbitbrush (*Chrysothamnus nauseosus*). The grass/forb component consists primarily of weedy species including cheatgrass (*Bromus tectorum*) and Russian thistle (*Salsola kali*).

Grass/Forb Habitats. This vegetation type includes grass-dominated areas that contain primarily non-native plant species of limited wildlife value. This type also includes plantings of non-native crested wheatgrass (*Agropyron cristatum*), cultivated rye, and other palatable forage grasses.

Riparian/Deciduous Shrub Habitats. These plant associations are associated with the Umatilla River and several irrigation ditches and typically consist of non-native Russian-olive (*Elaeagnus angustifolia*), native willows (*Salix* spp.), and golden currant (*Ribes aureum*).

Wetland Habitats. This habitat includes emergent/scrub-shrub wetlands dominated by cat-tail (*Typha latifolia*), spike-rushes (*Eleocharis* spp.), Russian-olive, and other wetland plant species. As shown in Figure 3.5-1, there are four wetlands (#'s 1, 2, 3, and 4) in the vicinity of the proposed PGT Gas Line route. There are no wetlands associated with the proposed NWP pipeline route.

Open Water Habitats. Areas of open water include holding ponds for agricultural and industrial purposes, as well as areas of the Umatilla River.

Cropland. Croplands are irrigated and non-irrigated fields purposely cultivated for a specific crop (usually corn, alfalfa, or potatoes), and their immediately adjacent areas.

Electrical Transmission Line

The two alternative routes of the electrical transmission line may affect shrub-steppe, grass/forb, riparian, wetland, open water, pasture, and cropland habitats. Pasture habitats include both non-irrigated and irrigated areas used for livestock grazing. As shown in Figure 3.5-1, there are ten wetlands (#'s 5, 6, 7, 8, 9, 10, 11, 12, 20, and 21) associated with the Western 230-kV Alternative (including the UECA 115-kV Relocation) route. There are seven wetlands (#'s 13, 14, 15, 16, 17, 18, and 19) associated with the Eastern 500-kV Alternative (including the McNary-Lower Monumental Relocation) route.

Water Supply Pipeline

The water supply pipeline traverses shrub-steppe and cropland habitats. There are no wetlands associated with this pipeline route.

3.5.2 Threatened, Endangered, and Sensitive Plant Species

The Oregon Natural Heritage Program (ONHP) and the Washington Natural Heritage Program (WNHP) were contacted to determine recorded locations of all known Federally listed and state-listed rare plants and other plant species of concern tracked by the ONHP within a 80.6-km (50-mile) radius of the cogeneration facility site. These queries indicated that 16 such plant species had been documented from within this search area, none of which are Federal or state listed as threatened or endangered. During pre-field reviews, potential habitat was thought to exist within the project area for seven of these species. Field investigations were made in mid-April, mid-May, and late June 1994 to locate these target species within the project area. No state or Federally listed, proposed, or candidate plant species were located during any of the surveys.

3.6 Wildlife and Fisheries Resources

3.6.1 Wildlife Habitat

Ten habitat types were identified within a 2,513-ha (6,209-acre) mapped project study area, consisting of the area within a 152-m (500-foot) buffer around the cogeneration facility site, the Eastern 500-kV Alternative line (including the 500-kV McNary-Lower Monumental realignment), the Western 230-kV Alternative line (including the UECA 115-kV Relocation route), the PGT and NWP gas lines, and the water supply line. These types include: grass/forb, sagebrush (*Artemesia tridentata*) dominated shrub-steppe, bitterbrush (*Purshia tridentata*) dominated shrub-steppe, rabbitbrush (*Chrysothamnus* spp.) dominated shrub-steppe, cropland, pastureland, riparian/deciduous shrub, open water, wetlands, and non-vegetated land (Northwest Wildlife Surveys [NWS] 1994a). Each of these types provide habitat for a variety of species, although some habitats may be used on only a seasonal basis or provide the habitat needed for only one life requisite (e.g., forage but not cover). Most of the wildlife species found in the project vicinity are common throughout the Columbia Basin in Oregon and Washington. Field surveys indicate that wide-ranging wildlife species such as the coyote (*Canis latrans*), badger (*Taxidea taxus*), northern harrier (*Circus cyaneus*), and black-billed magpie (*Pica pica*) range throughout all or nearly all of the 10 vegetation types in the mapped area. The amount of each habitat type, habitat characteristics, and wildlife species associated with each habitat type are described below and summarized by project component in Table 3.6-1.

Croplands and Pasture

Croplands consisting mostly of irrigated potatoes, corn, or alfalfa, along with associated weedy areas between irrigated areas, are the predominant wildlife habitat in the mapped study area, covering 1,111 ha (2,745 acres), or 44 percent of the total project vicinity (Table 3.6-1). The entire 6.9-ha (17-acre) cogeneration facility site is composed of cropland. Approximately 475 ha (1,174 acres) of cropland occurs along the Western 230-kV Alternative route (parts of which also include segments of the existing UECA 115-kV corridor). Croplands do not provide year-round habitat for wildlife, but several species use them during the spring, notably long-billed curlews and ring-necked pheasants (Woodward-Clyde Consultants 1993). Irrigated croplands provide important foraging and possibly nesting habitat for curlews (NWS 1994a, 1994b; Pampush and Anthony 1993; Allen 1980). Pheasants typically use corn fields in the fall for forage and cover. Other species noted to use croplands include western meadowlarks and western kingbirds. Croplands and pastures both support small mammals that are prey for raptors but tall, dense crops such as corn make capture difficult (Postovit and Postovit 1987).

Irrigated pastures often contain standing water and are frequently used by shorebirds, songbirds, and waterfowl. Species observed in pastures in the project vicinity include long-billed curlews, American avocets (*Recurvirostra americana*), mallards (*Anas platyrhynchos*), green-winged teal (*Anas crecca*), red-winged blackbirds (*Agelaius phoeniceus*), Brewer's blackbirds (*Euphagus cyanocephalus*), and killdeer (*Charadrius vociferus*) (Woodward-Clyde Consultants 1993).

Shrub-Steppe Communities

Sagebrush, rabbitbrush, and bitterbrush dominated shrub-steppe communities are the second most common types of wildlife habitat in the mapped study area, covering a total of 597 ha (1,476 acres) (Table 3.6-1). Elimination of the native shrub-steppe community throughout much of the area over the last half century has resulted in a decline or loss of wildlife species that depend on this habitat. In addition, habitat fragmentation and proximity to development tends to favor generalist species that can use a variety of relatively disturbed habitats and are tolerant of human activity. Most of these habitats are degraded due to grazing and past cultivation, although native grasses such as needle-and-thread grass (*Stipa comata*) occur as less than 0.4-ha (1-acre) inclusions, mostly along the PGT route. Patches of all three types of shrub-steppe habitats occur along the Eastern 500-kV Alternative route and the Western 230-kV Alternative route, while sagebrush and rabbitbrush-dominated shrub-steppe also occurs along the NWP Gas Line Route and the water supply line route. The water supply line route and the PGT Gas Line route support only sagebrush habitat. Sagebrush habitat occupies a total of 251 ha (621 acres), or 10 percent of the mapped area, while rabbitbrush and bitterbrush occupy 214 and 130 ha (533 and 322 acres), respectively, or about 5 and 8 percent, respectively. Bitterbrush-dominated habitat is limited to the Umatilla Ordnance Depot and a few other small areas along the Eastern 500-kV and Western 230-kV Alternative routes, where disturbance is less severe.

Species most commonly observed in this habitat were ground-nesting birds, including the western meadowlark (*Sturnella neglecta*), long-billed curlew, ring-necked pheasant (*Phasianus colchicus*), and northern pocket gopher (*Thomomys talpoides*) (NWS 1994a, Woodward-Clyde Consultants 1993). Black-billed magpies also nest in the sagebrush. Shrub-steppe typically supports higher densities of small mammals, as do grasslands dominated by cheatgrass (Gano and Rickard 1982). Consequently, the shrub-steppe in the project vicinity is likely used for foraging by raptors and other carnivores.

Grass/Forb Communities

Grasslands make up approximately 366 ha (904 acres), or 15 percent of the mapped study area, including: (1) degraded bunchgrass habitat that is now dominated by cheatgrass and tarweed; and (2) plantings of crested wheatgrass, cultivated rye, and other high forage value grasses. The former type is disturbed and probably provides relatively low-quality habitat for wildlife. Species observed in the grasslands include the western meadowlark, long-billed curlew, ring-necked pheasant, grasshopper sparrows (*Ammodramus savannarum*), savannah sparrows (*Passerculus sandwichensis*), and horned lark (*Eremophila alpestris*) (NWS 1994b, Woodward-Clyde Consultants 1993). All of these species breed on the ground in grasslands (Cody 1985, Schroeder and Sousa 1982, Allen 1980) and it is likely that these habitats are used for nesting as well as foraging. Field surveys indicate that the 4.8-km (3-mile) NWP Gas Line route along the boundary of the SCS's Conservation Reserve Program (CRP) supports nesting habitat for grasshopper and savannah sparrows and foraging habitat for long-billed curlews. Nesting curlews were documented off the proposed ROW to the south and north of Feedville Road in a fallow area.

Riparian/Deciduous Shrub Communities

Riparian/deciduous shrub wildlife habitat occupies approximately 57 ha (141 acres) or 2 percent of the mapped study area (Table 3.6-1). These Russian olive (*Elaeagnus angustifolia*), willow (*Salix* spp.), and cottonwood (*Populus trichocarpa*) dominated areas are found where the combined UECA 115-kV and Western 230-kV Alternative crosses the Umatilla River, as well as at several irrigation ditches and in the Power City Wildlife Area south of McNary Substation along the Eastern 500-kV Alternative route. There are 30 ha (75 acres) of this habitat along the Eastern 500-kV Alternative route, 15 ha (36 acres) along the Western 230-kV Alternative route (including 3 ha [8 acres] along the joint 230-kV/UECA 115-kV ROW), and 9.3 ha (23 acres) along the PGT Gas Line Alternative route.

Wildlife species that use these habitats include raccoons (*Procyon lotor*), beaver (*Castor canadensis*), red-tailed hawk, Swainson's hawk, California quail (*Callipepla californica*), house wren (*Troglodytes aedon*), bewick's wren (*Thryomanes bewickii*), mourning dove (*Zenaida macroura*), and lazuli bunting (*Passerina amoena*).

Wetlands

Emergent wetlands comprise approximately 40 ha (98 acres), or 2 percent of the mapped study area within 21 individual wetlands (see Figure 3.5-1). Scrub-shrub wetlands were included in the riparian category and described above (Table 3.6-1). Most of this acreage is located in the Power City area along the Eastern 500-kV Alternative route. There are also several small wetlands along the Umatilla River near the crossing of the 230-kV/UECA route. Wildlife species observed in wetland habitats along the Umatilla River include Canada geese (*Branta canadensis*), Forster's terns (*Sterna forsteri*), and mallards (Woodward-Clyde Consultants 1993). Other species observed in the emergent and scrub-shrub wetlands include red-winged blackbirds, Brewer's blackbird, great blue herons (*Ardea herodias*), green-winged teal (*Anas crecca*), American avocets, black-necked stilts (*Himantopus mexicanus*), killdeers (*Charidrius vociferus*), marsh wrens (*Cistothorus palustris*), song sparrows (*Melospiza melodia*), California quail, brown-headed cowbirds (*Molothrus ater*), painted turtles, treefrogs, (*Pseudacris regilla*), and bullfrogs (*Rana catesbeiana*) (NWS 1994b, Woodward-Clyde Consultants 1993). It is possible that the scrub-shrub component of this habitat provides nesting habitat for several species of song birds such as lazuli bunting and song sparrows.

Open Water

Two ha (5 acres) of open water habitat in the mapped study area occur in the Umatilla River and agricultural/industrial sites. Mallards, common merganser (*Mergus merganser*), wood duck, belted kingfisher (*Cercyle alcyon*), bank swallows, and great blue heron were observed in this habitat (NWS 1994b).

Pastureland

A total of 90 ha (223 acres) of pasture land in the mapped study area, dominated by non-native grasses, supports foraging long-billed curlew, California quail, ring-necked pheasant, and other species (NWS 1994b).

3.6.2 Sensitive Wildlife Species

Currently only two of the sensitive wildlife species potentially occurring in the project vicinity are Federally listed as endangered or threatened; 17 species are candidates for Federal listing (14 Category C2, two Category 3C, and one Category 3B species) (NWS 1994b, letters from R. Peterson, Field Supervisor, U.S. Fish and Wildlife Service [USFWS], Portland, Oregon, April 12, 1994 and June 27, 1995). In addition, 15 species are designated by the Oregon Department of Fish and Wildlife (ODFW) and/or ONHP as threatened, critical or vulnerable (ODFW 1992, ONHP 1993) (Table 3.6-2).

Federally Listed or Proposed Wildlife Species

The bald eagle is the only Federally listed species observed during surveys of the project and there is no critical habitat for any Federally listed species in the project vicinity (NWS 1994c). Surveys and consultation with local wildlife biologists indicate that wintering bald eagles, listed as threatened by the USFWS and ODFW, winter along the Columbia River and use habitats along and near the Umatilla River. Consultation also indicated that peregrine falcons (*Falco peregrinus*), a Federally endangered species, only rarely occur in the area during spring and fall migration, with the only documented observations occurring several miles from the project vicinity (NWS 1994c).

During 1993 to 1994 winter surveys, a small number of bald eagles were observed using habitats along the Umatilla River within 3.1 km (5 miles) of the cogeneration facility site and within 1.6 km (1 mile) of the PGT Gas Line route. Local residents and businessmen reported occasionally seeing a bald eagle in previous winters within 1.6 km (1 mile) of the cogeneration facility site. The section of the Umatilla River near the PGT route has the highest quality foraging and roosting habitat in the vicinity of the project (NWS 1994c). Although providing some potentially suitable roosting and foraging habit, the Power City Wildlife Area near the McNary Round-up corridor (Eastern 500-kV Alternative) is not used because the ponds readily freeze eliminating use by waterfowl, a primary prey of eagles (NWS 1994c). Potential wintering by bald eagles in the project vicinity is most likely limited by the lack of cottonwoods or other large trees and perch sites. Well outside the project vicinity, the Cold Springs and Umatilla National Wildlife Refuges provide regularly used bald eagle habitat; open water in the winter provides habitat for waterfowl. Spawned-out coho salmon in the lower Umatilla River may also provide a source of food from November through January (NWS 1994c).

A Biological Assessment for the one Federally listed species is included in Chapter VI, Appendix B.

Federal Candidate Species

No Federal candidate species (Category C2) were observed in the project study area during field surveys, and habitat for most of these species is limited or non-existent (NWS 1994a, 1994b, 1994c). A Category C2 species, the loggerhead shrike, was observed in the project vicinity. Information on the 14 Federal candidate (Category C2) species potentially occurring in the project vicinity, their habitat requirements, and distribution is provided below. Federal candidate (Category C3) species are addressed in the state-listed species section.

Spotted frog. The spotted frog occurs in cold streams, ponds, and marshes throughout the Cascade Mountains and areas of eastern and central Oregon. In the shrub-steppe zone, it is found in cold permanent marshes, ponds, and small lakes. It is unlikely that this species occurs in the project vicinity.

Northwestern pond turtle. The northwestern pond turtle requires sluggish or quiet water with abundant vegetation and basking sites (National Audubon Society 1979). This species is not likely to occur in the project vicinity.

Northern sagebrush lizard. The northern sagebrush lizard inhabits primarily shurb-steppe habitat characterized by gravelly soils or fine-sand dunes (Behler and King 1979). This species requires shelter such as stony piles, crevices, and animal burrows (Behler and King 1979). Habitat for the northern sagebrush lizard is present in the project vicinity, although this species is not documented to occur there (letter from C. Levesque, Data Handler, Oregon Natural Heritage Program, Portland, Oregon, June 7, 1995).

Tri-colored blackbird. Tri-colored blackbirds are found primarily in California (National Geographic Society 1987), but there are a few records in Oregon, including a small number (less than 40) observed infrequently at Mann's Pond, 1.6 km (1 mile) southeast of the cogeneration facility site during the 1989-1992 breeding seasons (NWS 1994a, 1994b). This species nests in large marshes and feeds in adjacent agricultural areas (Ehrlich et al. 1988). Wetlands in the project vicinity are too small to provide optimal habitat. Power City Wildlife Area and Mann's Pond are considered marginally suitable habitat.

Ferruginous hawk. The ferruginous hawk has been documented in Umatilla and Morrow counties (ONHP 1993) and is known to nest 12.8 km (8 miles) east of Hermiston (NWS 1994b). This species typically nests on the ground on the sides or summits of low hills, in juniper trees (Janes 1985), or on rock pinnacles (Ramakka and Woyewodzic 1993). They also use transmission towers and abandoned windmill platforms. Ferruginous hawks prefer shrublands and native grasslands and avoid croplands and areas with high density of perches (Janes 1985). Because of the high proportion of cropland and disturbed grassland, suitable habitat for this species is not available in the project vicinity.

Mountain quail. There are no records of mountain quail in Umatilla or Morrow counties, although it is known to occur in the Blue Mountains (ONHP 1993). This species is typically associated with brushy sites, such as old clearcuts or burned areas that are surrounded by forests or woodlands (Ehrlich et al. 1988). The project vicinity does not contain habitats suitable for mountain quail; therefore, they are not likely present.

Loggerhead shrike. The loggerhead shrike has been documented in Umatilla and Morrow counties (ONHP 1993). This species is typically observed in open woodlands and shrublands (Ehrlich et al. 1988). Suitable habitat for this species is found in the project vicinity, especially areas dominated by sagebrush shrub-steppe. A few individuals were observed in the Umatilla Ordnance Depot west of the project in 1994 (NWS 1994b).

Pygmy rabbit. Pygmy rabbits are most common in southeastern Oregon (Washington Department of Wildlife [WDW] 1993), and none have been documented in Umatilla or Morrow counties (ONHP 1993). This species is dependent upon sagebrush, which composes 99 percent of its diet (WDW 1993). The project vicinity has only sagebrush habitat that has been severely degraded by grazing and other activities and, therefore, is not likely to be suitable for this species.

Long-eared myotis. The limiting factor in the distribution of the long-eared myotis is the availability of undisturbed conifer forest providing loose tree bark and caves for roosting and nesting (Maser et al. 1984). This species is unlikely to occur in the project area due to the lack of suitable habitat, and is not documented to occur there (letter from C. Levesque, Data Handler, Oregon Natural Heritage Program, Portland, Oregon, June 7, 1995).

Long-legged myotis. The limiting factor in the distribution of the long-legged myotis is the availability of undisturbed conifer forest providing loose tree bark and caves for roosting and nesting (Maser et al. 1984). This species is unlikely to occur in the project area due to the lack of suitable habitat, and is not documented to occur there (letter from C. Levesque, Data Handler, Oregon Natural Heritage Program, Portland, Oregon, June 7, 1995).

Yuma myotis. The Yuma myotis is closely associated with water such as rivers and lakes, and uses buildings, mines, caves, and bridges away from human disturbance for nurseries and roosting (Maser et al. 1984). Habitat for the Yuma myotis is present in the project vicinity, although this species is not documented to occur there (letter from C. Levesque, Data Handler, Oregon Natural Heritage Program, Portland, Oregon, June 7, 1995).

Pacific western big-eared bat. The Pacific western big-eared bat has been documented in Umatilla County (ONHP 1993) and forages in a wide variety of habitats, including grasslands and shrublands (Thomas 1979). They are dependent upon caves and cave-like structures such as mines, tunnels, and the underside of bridges for roosting (Thomas 1979). Foraging and roosting habitat is present in the project vicinity.

<u>State-listed Wildlife Species</u>

Nine state sensitive species the long-billed curlew, great egret (*Casmeroduis albus*), Swainson's hawk, grasshopper sparrow (*Ammodramus savannarum*), black-throated sparrow (*Amphispiza bilineata*), burrowing owl (*Athene cunicularia*), bank swallow, American white pelican (*Pelecanus erythrorhynchos*), and painted turtle (*Chrysemys picta*) were recorded in the project vicinity during field surveys in 1992 through 1994 (NWS 1994a, 1994b; Woodward-Clyde Consultants 1993). Seven of these species were documented in the study area 320- to 381-m (1,050- to 1,250-foot) corridors.

Long-billed curlew. Field surveys indicate that the long-billed curlew, an ONHP Species of Concern and Federal Category C3 candidate species, is fairly common in the project vicinity, and both nesting and foraging habitats have been documented. In Oregon, this species typically nests in cheatgrass (Pampush and Anthony 1993). A dense grassland managed as a CRP by the SCS adjacent to a section of the combined route of the NWP Gas Line and the Eastern 500-kV Alternative provide foraging habitat. An area just to the south and north in this location appears to have suitable curlew nesting habitat (NWS 1994a). Nesting has been documented very close to the Eastern 500-kV Alternative route, NWP gas line, and many areas south of the Umatilla River (NWS 1994a). A main nesting area in the region is on the Umatilla Ordnance Depot west of the Western 230-kV Alternative route. In eastern Oregon, curlews typically nest in grasslands, particularly those dominated by cheatgrass (as long as grass cover is not too high), and forage on invertebrates in nearby irrigated croplands (Pampush and Anthony 1993).

Grasshopper sparrow. During field surveys of the project vicinity, grasshopper sparrows, an ODFW Sensitive species, and ONHP 3 species, both classifications meaning that additional information is needed to assess vulnerability, were observed near I-84 and on the Umatilla Ordnance Depot along the Western 230-kV Alternative route (NWS 1994b). There is also nesting near Feedville Road north of the PGT Gas Line route, as well as on the NWP Gas Line route (NWS 1994a, 1994b). It is highly likely that this species nests within the project vicinity. Habitats for the grasshopper sparrow include grasslands, pastures, and cultivated fields (Ehrlich et al. 1988).

Swainson's hawk. Swainson's hawks, an ODFW state vulnerable and ONHP 3 species, were observed just south of the Westland Substation during field surveys in 1992 and 1993 (Woodward Clyde Consultants 1993). The 1993 observations indicated that this species may have nested in trees growing in the riparian corridor along the Umatilla River (Woodward Clyde Consultants 1993). Several nests have been documented in the project vicinity, including two very near the Eastern 500-kV Alternative route. One is near the Power City Wildlife Area and one is near the route south-southeast of Hermiston (NWS 1994b). Swainson's hawks nest almost exclusively in trees (Janes 1985), which, in eastern Washington and Oregon, are generally limited to riparian areas and abandoned farms. Forage habitat includes grasslands, shrub-grasslands, and croplands.

Burrowing owl. The burrowing owl nests in burrows in shrub-steppe, grasslands, pastures, and roadsides throughout eastern Oregon. Burrowing owls are known to occur on the Umatilla Ordnance Depot to the west of the Western 230-kV Alternative route, and several other areas within the project vicinity. However, no sites are near proposed project components.

Bank swallow. Field surveys located a bank swallow colony along a portion of the 230-kV route to be shared with Hermiston Generating Project. This colony occurred in a sandy bank created by past quarry operations (Woodward Clyde Consultants 1993). There are several nesting colonies along the Umatilla River near the PGT Gas Line route (NWS 1994b). The bank swallow typically nests in burrows near water and forages on insects (Ehrlich et al. 1988). This species is designed by ODFW as state sensitive, undetermined status and is on the ONHP's List 3.

American white pelican. Nonbreeding individuals of this species, listed as sensitive by ODFW and Category 2 by ONHP, commonly occur along the Columbia River and other relatively large ponds and lakes in the area during the summer (NWS 1994c). None of the observations of American white pelicans made during field surveys were within the mapped study area. The nearest nesting takes place 48 km (30 miles) up the Columbia River from Umatilla (NWS 1994b).

Painted turtle. The painted turtle, an ODFW State Critical species, occurs at Power City Wildlife Area and other sites along the Eastern 500-kV Alternative route, and in Mann's Pond, approximately 1.6 km (1 mile) southeast of the cogeneration facility site. This species requires ponds or other slow moving water with muddy bottoms.

None of the other eight state-listed species have been documented in or adjacent to the project study area. These species include: blotched tiger salamander (*Ambystoma tigrinum marmorata*), northern leopard frog (*Rana pipilens*), western toad (*Bufo boreas*), Franklin's gull (*Larus pipixcan*), yellow-billed cuckoo (*Coccyzus americanus*), pallid bat (*Antrozous pallidus pacificus*), fringed myotis (*Myotis thysanodes*), and Washington ground squirrel (*Spermophilus washingtoni*).

The Washington ground squirrel, listed by the ODFW as critical, was recorded in the vicinity of the project in 1990 (Betts 1990). However, this site is now irrigated cropland and no Washington ground squirrels were observed during field surveys in 1992, 1993, and 1994 (Woodward Clyde Consultants 1993, NWS 1994b). A nearby colony, south of the Umatilla River appeared to be abandoned in 1993 (Woodward Clyde Consultants 1993) 1.6 km (1 mile) from its eastern terminus.

Habitat for the other sensitive species potentially occurring in the project vicinity is limited to non-existent at the cogeneration facility site or along the ROWs (NWS 1994a).

3.6.3 Fisheries

There are two fisheries resources within the vicinity of the project the Columbia and Umatilla rivers. Major stocks present in the Columbia River include spring, summer, and fall chinook salmon (*Oncorhynchus tshawytscha)*; coho salmon (*O. kisutch*); sockeye salmon (*O. nerka*); and summer steelhead (*O. mykiss*). Approximately 0.5 to 1 million adult salmon and steelhead pass this region annually on their upstream migration (WDF and ODFW 1992). Additionally, tens of millions of juvenile salmon and steelhead smolts migrate downstream past this region in the spring, summer, and fall. This region of the Columbia River is currently listed as part of the "critical habitat" for the Federally listed endangered Snake River sockeye salmon, and the Federally listed threatened spring/summer and fall chinook that pass through this region during annual migration (Federal Register, Vol. 55, No. 232, 2 December 1992).

The Umatilla River has many of these same anadromous stocks, including spring and fall chinook and coho salmon, with summer steelhead the only remaining wild stock. Currently, millions of smolts are released annually into the Umatilla system (Fish Passage Center 1994).

Diversion of water and lack of fish passage facilities in the past on the Umatilla River have resulted in difficulty in juvenile smolts successfully leaving the system in the spring and adults returning in the summer and fall. Currently, passage facilities are being operated on the Umatilla to reduce loss of smolts and returning adults (Knapp 1994). Restoration and enhancement projects efforts are occurring for all anadromous stocks within the basin (Bailey and Laws 1994). The Umatilla River also contains resident game fish species (such as resident rainbow trout and some warm water fish such as smallmouth bass), as well as non-game fish (such as chubs and suckers).

The Columbia and/or Umatilla River are also potentially inhabited by two Federal-candidate species of fish, the margined sculpin and the Pacific lamprey. The margined sculpin ranges from the Walla Walla River in Washington south to the Umatilla River (Wydoski and Whitney 1979). This species is most frequently associated with moderate to rapid current on a bottom of rubble or gravel (Wydoski and Whitney). Spawning adult (during June and July) and larvae Pacific lamprey inhabit fine silt deposits in backwaters and quiet eddies of coastal streams and large inland rivers, and may occur in the project vicinity (Wydoski and Whitney 1979; letter from R. Peterson, Field Supervisor, U.S. Fish and Wildlife Service, Portland, Oregon, June 27, 1995).

3.7 Land Use

3.7.1 Land Use Characteristics

Cogeneration Facility Site

The cogeneration facility would be located on a 6.9-ha (17-acre) parcel of land in an industrial area of unincorporated Umatilla County. The site is currently used by the J.R. Simplot Company for alfalfa production and is adjacent to (west of) the J.R. Simplot potato processing plant. To the south, the site is bounded by the J.R. Simplot access road, and to the west lies an agricultural field operated by the J.R Simplot Company. A Union Pacific Railroad transportation facility is located to the north of the site.

Land uses near the cogeneration facility site include the following:

- The J.R. Simplot Potato Processing Plant and associated facilities immediately east and north of the cogeneration facility site;
- An agricultural field (owned by the J.R. Simplot Company) immediately adjacent to the site to the west and northwest;
- An agricultural field approximately 487.7 m (1,600 feet) north of the site, and agricultural fields west of the site;
- Agribusiness approximately 670.6 m (2,200 feet) northwest of the site;
- The Union Pacific Railroad Hinkle rail yards and Amtrak passenger station approximately 231.4 m (700 feet) north of the CT facility site;
- A residence approximately 0.8 km (0.5 mile) south of the site located on land designated for agricultural use; and
- The Umatilla River and riparian areas approximately 213.4 m (700 feet) south of the site.

Transmission Line Routes

Eastern 500-kV Alternative. This route would be composed of two sections, beginning at the cogeneration facility. The first section of line would be 8.6 km (5.4 miles) long and would be routed primarily along an existing Pacific Power and Light Corridor. The new transmission line would run from the cogeneration facility to the McNary-Roundup Corridor and would consist of new single circuit, single pole transmission line with poles spaced between 152 and 244 m (500 to 800 feet) apart (Figure 1-1).

Land uses within 0.8 km (0.5 mile) of the new first section of transmission line include: industrial, commercial, aggregate resource, agribusiness, agricultural, and residential. There is currently one residence within 152 km (500 feet) of this reach of the proposed route of the Eastern 500-kV Alternative.

The second 13.7-km (8.5-mile) section would begin at the intersection of Canal Road and the McNary-Roundup corridor. The transmission line would be located adjacent to and east of existing lines within the existing 76 m (250 foot) wide McNary-Roundup ROW proceeding in a northwesterly direction to a point 1.4 km (0.9 mile) south of the McNary Substation. Land uses adjacent to the McNary-Roundup corridor include: agriculture, industrial, and residential. There are 115 residences located within 152 m (500 feet) of this section of the proposed Eastern 500-kV Alternative route.

The Hermiston Power Project 500-KV line would leave the McNary-Roundup corridor 1.4 km (0.9 mile) south of the McNary Substation, and follow the existing McNary-Lower Monumental transmission line route and would use its poles and conductors. The McNary-Lower Monumental 500-kV line would be rerouted approximately 200 m (656 feet) east of its present location. Land uses that occur along the new McNary-Lower Monumental route include agriculture, transportation (Highway 395), and industrial.

Along the McNary Corridor and relocated McNary-Lower Monumental portions, conductors would be supported by either steel towers or poles, spaced at 304.8 m and 365.8 m (1,000 and 1,200 feet, respectively).

Western 230-kV Alternative. This route would be primarily located in unincorporated Umatilla County. The route would also pass through the city of Umatilla, and the city of Umatilla urban growth boundary.

The Western 230-kV Alternative would use for the most part an existing 16-km (10-mile) transmission line route (the combined UCEA/Herimiston Generating Project 230-kV Corridor). Current land uses in and adjacent to the UCEA corridor include: agriculture; agribusiness; transportation; the Umatilla Ordnance Depot; and urban uses such as commercial, industrial, and residential. Three residences are located within 152 m (500 feet) of the route.

A new line would be required from the cogeneration facility site 3.5 km (2.2 mile) north and west to the Westland Substation. Current land uses in and adjacent to the corridor include: industrial, agribusiness, aggregate resource extraction, residential, and commercial. There are 13 residences within 152 m (500 feet) of this section of the route.

This alternative also requires relocation of a UECA 115-kV line from McNary Substation along Power Line Road. Most of the 13-km (8-mile) long route will be located in unincorporated Umatilla County. Approximately 3.2 km (2.0 miles) of the north end of the route will pass through the city of Umatilla. The routes will be located adjacent to other transmission lines, county roads, or both. The section of the line that will cross the Umatilla River and I-82 will use existing 115-kV structures. Land uses along the route include agriculture, light industrial, and residential. There are 36 residences located within 152 m (500 feet) of the proposed route.

Gas Line

There are two gas pipeline routes that will be used to supply natural gas to the site. One route would connect to a NWP lateral and the other to a PGT lateral. Each of these routes would require construction of new pipeline. Existing land uses within 0.8 km (0.5 mile) of the 13.6 km (8.5 mile) NWP route include industrial, agricultural, residential, and agribusiness. Land uses within 0.8 km (0.5 mile) of the 6.4 km (4 mile) long PGT route include industrial, agricultural, residential, school, and agribusiness.

Water Supply and Wastewater Lines

The 2-km (1.25-mile) water supply pipeline route would be located between the cogeneration facility and the Port of Umatilla water treatment facility north of Feedville Road. Land uses within 0.8-km (0.5-mile) of the water line corridor include industrial, agricultural, transportation, agribusiness, and residential. The wastewater pipeline route would connect the cogeneration facility with the Simplot facility and pass entirely through industrial lands.

3.7.2 Comprehensive Plans and Policies

Project components would be located within two local jurisdictions: Umatilla County and the city of Umatilla. In addition, transmission routes cross the urban growth boundaries of the cities of Umatilla and Stanfield. Two adopted local comprehensive plans regulate land use in the project vicinity: the Umatilla Comprehensive Plan (Umatilla County

1987), and the City of Umatilla Comprehensive Plan (Umatilla City 1977).

Land uses outside of the cities' boundaries, but within the urban growth boundaries, are under county jurisdiction. However, under the Urban Growth Area Joint Management Agreement between the county and the city of Umatilla, the county has agreed to incorporate into the Umatilla County Comprehensive Plan that portion of the City of Umatilla Comprehensive Plan that addresses the urban growth area. Thus in urban growth areas, county zoning designations apply, while the city's comprehensive plan designations apply.

Figures 3.7-1a through 3.7-1c depict the land use designations that the project cogeneration facility, transmission line options, natural gas lines, and water lines routes would pass through.

Table 3.7-1 lists the jurisdictions in which the project components would be located, including the land use and zoning designations each project facility would be located in or pass through. The cogeneration facility site and the water supply pipeline are located entirely within Umatilla County's planning jurisdiction. The Western 230-kV Alternative route is located primarily within the county's jurisdiction, although a small portion of the UECA 115-kV Corridor relocation passes through the Urban Growth Area of the city of Umatilla.

The Eastern 500-kV Alternative route, while located mainly within Umatilla County, passes through the Urban Growth Areas of the city of Umatilla, the cities of Hermiston, Stanfield, and Umatilla.

The PGT gas line connection would be located primarily within Umatilla County's planning jurisdiction, with a small portion passing in the Urban Growth Area of the city of Stanfield. The NWP gas line connection would also be located primarily within the county's jurisdiction, although a small portion passes through the Urban Growth Area of the city of Stanfield.

3.8 Cultural Resources

The historic properties inventory undertaken for the proposed project components covered approximately 394 ha (973 acres), including 51.5 km (32 miles) of linear features (Oetting 1993). The facilities surveyed were the: (1) cogeneration facility site, (2) Eastern 500-kV Alternative route (including the BPA 500-kV Lower Monumental Relocation), (3) Western 230-kV Alternative route (including the UECA 115-kV Relocation), (4) NWP and PGT natural gas lines, (5) water supply line from the Port of Umatilla Project treatment plant, and (6) wastewater effluent line connecting the proposed cogeneration facility with the J.R. Simplot Land application system.

The inventory resulted in discovery of nine cultural resources, including three historic era trash dumps and six canals. The surveyors determined the trash dumps to be ineligible for nomination to the National Register of Historic Places (NRHP). The canals that project components would cross are part of the Bureau of Reclamation's Umatilla Project. The Oregon State Historic Preservation Officer has determined portions of the Umatilla Project eligible for NRHP nomination.

Oral histories conducted by the Confederated Tribes of the Umatilla Indian Reservation (letter from G.F. Moura, Cultural Services Archaeologist, Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon, May 9, 1994) concluded that prehistoric and historic era Native Americans used the project vicinity, particularly the Umatilla River, for hunting, fishing, and gathering of medicinal and food plants. This investigation also identified an ethnographically known Umatilla fishing and campsite located where the Western 230-kV Alternative would cross the Umatilla River. The Indian names for the site are Miss-kha-low and Wanath-pa. It was used for salmon and eel fishing, and for salmon preparation.

HPP-H-1 is a small trash dump located along the existing McNary-Roundup Corridor (Eastern 500-kV Alternative). It consists of a concentration of refuse approximately 3 m (10 feet) in diameter and a thin scatter of refuse outside of the corridor. The refuse includes rusty cans, miscellaneous metal pieces, wide-mouthed milk bottles, and glass fragments. The cans include condensed milk, baking powder, soup, coffee, syrup, paint, and beer cans.

HPP-H-2 is a small trash dump located within the combined Eastern 500-kV Alternative/NWP Gas Line route. It consists of a concentration of refuse approximately 2.4 by 4.6 m (8 by 15 feet) in dimension. The refuse includes rusty cans, an automobile fender, automobile body sheet metal, bedsprings, barbed wire, mesh fencing, an enameled bowl, ceramic fragments, an aluminum lawn chair, and pieces of fiberglass. Some of these artifacts may date to the 1930s; others are recent (such as the aluminum chair and fiberglass).

HPP-H-3 consists of two small concentrations of historic trash with a thin scatter of trash between them located along the NWP Gas Line route. The site, as a whole, covers about 39.6 by 39.6 m (130 feet by 130 feet). The small concentrations are each about 1.5 by 3 m (5 by 10 feet) in size. The refuse includes rusty cans, ceramics, glass, enameled pots and pans, bed springs, stove parts, kitchen and farm utensils, auto maintenance supplies, toys, and leather goods. One license plate, dated 1933, appears to date the earliest use of the dump. Some of the trash dates to the 1940s, and some appears recent. This trash dump also appears to have been moved from elsewhere, since older and recent trash are randomly mixed and the surrounding vegetation appears recently disturbed.

All three trash dumps are similar in that each contains material dating no earlier than the 1930s and each also contains recent material. Each appears to be the result of incremental dumping activity with no apparent connection to a nearby farm, residence, or other specific source. These dumps therefore do not contain information significant in local, regional, or national history and are not eligible for NRHP nomination.

The gas line routes and Eastern 500-kV Alternative route would cross six canals that are part of the Umatilla Project at a total of nine canal crossings. Section 3.8 lists the canal crossings and the project components they cross. Beginning in 1906, the Bureau of Reclamation constructed the Umatilla Project, consisting of the Cold Springs Reservoir, several smaller diversion dams, and a network of delivery canals, some earthen, and some concrete-lined. Construction of these facilities sparked a boom in settlement and agricultural activity in the Hermiston-Umatilla area. The Oregon State Historic Preservation Office (SHPO) has determined that the Cold Springs Dam and associated canals are eligible for nomination to the NRHP since it is a well-preserved example of early 20th century irrigation engineering (letter from S.J. Brawley, U.S. Bureau of Reclamation, Pacific Northwest Region, Boise, Idaho, August 2, 1991; letter from J.M. Hamrick, Oregon SHPO, Salem, Oregon, September 25, 1992. The Umatilla Project is one of the few projects of its kind still in operation, mostly unaltered since construction. All elements of the Umatilla Project are potentially eligible for NRHP nomination.

3.9 Socioeconomics and Public Services

3.9.1 Population and Housing

Population characteristics of Umatilla county and communities in the project vicinity between 1980 and 1992 are presented in Table 3.9-1. A breakdown of minority population from the 1990 Census of population and housing is presented in Table 3.9-2.

Table 3.9-1. Population Characteristics

Characteristics	State of Oregon	Umatilla County	Hermiston	Stanfield	Umatilla
Population 1980 1990	2,633,156	58,861	9,408	1,568	3,194

	2,842,321	59,249	10,075	1,570	3,050
Percent change 1980-1990	7.9	0.7	7.1	0.1	-4.7

Source: Center for Population Research 1993

Table 3.9-2. Minority Group Breakdown

Race and Hispanic Origin	**State of Oregon**	**Umatilla County**
White Black **Percent of total population** American Indian, Eskimo, or Aleut **Percent of total population** Asian or Pacific Islander **Percent of total population** Other race Hispanic origin (of any race) **Percent of total population**	 2,636,787 46,178 **1.6** 38,496 **1.4** 69,269 **2.4** 51,591 112,707 **4.0**	 52,743 371 **0.6** 1,850 **3.1** 533 **0.9** 3,752 5,307 **9.0**

Source: U.S. Bureau of Census 1990

The permanent housing supply in the project vicinity is limited. Housing demand currently exceeds supply, resulting in low vacancy rates and long waiting lists for persons looking for housing. Current vacancy rates are less than 0.5 percent (BPA EIS 1994a). Rental housing, when it becomes available, is rented immediately. New housing construction within the area is limited because the average income levels, generally, cannot support the costs associated with constructing new housing for owner occupants (BPA 1994b).

In Hermiston, about 20 or 30 new multi-family housing units may be constructed within 1 to 2 years. If demand is high, an additional 60 or 80 units may be constructed (BPA 1994b).

Transient housing accommodations are provided by hotels, motels, some bed and breakfast establishments, and recreational vehicle (RV) parks. The total number of hotel, motel, and bed and breakfast rooms in the immediate project vicinity is approximately 874 units. Of this total, 149 units are available in Hermiston, 181 units are available in Umatilla, and 111 units are available in Boardman (Hermiston Chamber of Commerce 1994). An additional 433 units are available in Pendleton (BPA 1994b). The Tri-Cities of Pasco, Kennewick, and Richland have approximately 2,500 similar rooms available, according to the Tri-City Visitor and Convention Bureau.

RV and mobile home accommodations in the project vicinity are limited in Echo and Pendleton have a total of 39 spaces. Seven spaces are located in Echo, and 32 spaces are in Pendleton (BPA 1994b). A new RV park with between 50 and 100 spaces is proposed for the Hermiston area (BPA 1994a). At present, the four RV parks listed by the Tri-Cities Convention and Visitors' Bureau have in excess of 250 spaces. Vacancy rates are generally very low. In January 1994, there were approximately ten vacancies among the three RV parks (BPA 1994b).

3.9.2 Employment and Income

Employment during the 1970s expanded rapidly in Umatilla County. Then in the 1980s, the available labor force expanded at a rate faster than employment, resulting in a fairly high unemployment rate. Total 1992 employment in Umatilla County was 30,630 jobs with an available labor force of 33,860. This includes jobs that are not covered by unemployment insurance, which typically are in the agricultural sector and are seasonal in nature. The stability of employment in the project vicinity is primarily dependent on the stability of the agricultural industry.

Employment in Umatilla County covered by unemployment insurance from the 1990 Census is shown on Table 3.9-3.

Table 3.9-3. Umatilla County Employment by Industry

Type of Work	Number of Jobs
Industry[1]	
Agriculture, forestry, and fisheries	3,362
Mining	55
Construction	1,066
Manufacturing, nondurable goods	2,678
Manufacturing, durable goods	1,718
Transportation	1,262
Communications and other public utilities	523
Wholesale trade	859
Retail trade	4,437
Finance, insurance, and real estate	988
Business and repair services	660
Personal services	773
Entertainment and recreation services	251
Health services	2,078
Educational services	1,887
Other professional and related services	1,305
Class of Worker	
Employed person 16 years and over	25,612
Public administration	1,680
Private wage and salary workers	18,259
Government workers	4,549
Self-employed worker	2,575
Unpaid family worker	229

[1] Includes both government and private sectors
Source: U.S. Bureau of Census 1990

Table 3.9-4 summarizes per capita personal incomes in Umatilla County from 1982 through 1991. Both counties are below the state average for both per capita personal income and median household income.

Table 3.9-4. Per Capita Personal Income Morrow County and Umatilla County 1982 - 1991

	Per Capita Income ($)			1982 to 1991 % Change	1982 to 1991 Annual Average Change (%)
	1982	1986	1991		
State of Oregon	10,651	13,541	17,024	+59.8	+5.3
Umatilla County	9,393	11,728	14,266	+51.9	+4.7

Source: U.S. Bureau of Economic Analysis

3.9.3 Fiscal Budgets

The current Umatilla County tax base is approximately $1.2 billion, while the Hermiston School District tax base is approximately $500 million (Brookshier 1994). The 1993 revenues collected by Umatilla County amounts to $33 million. (Information is from the Umatilla County Tax Department.)

3.9.4 Law Enforcement

The cogeneration facility site is within the jurisdiction of the Umatilla County Sheriff's Department. Police protection would be provided by the department's West County Station, which has a total of four deputies patrolling a service area of about 389 square km (150 square miles) (pers. comm., D. Age, Umatilla County Sheriff's Department, December 1, 1993; ENSR Consulting and Engineering 1994a). The Oregon State Police (OSP) has an office in the McNary District of the City of Umatilla. Twenty officers are currently stationed there. The OSP, along with the Sheriff's Department, provide police services for the project vicinity.

The Hermiston Police Department provides police protection services within the city limits. The department maintains a staff of 15 police officers and 7 dispatchers. The Hermiston Police Department would provide second response capabilities for the energy facility site through its mutual aid agreement with the Sheriff's Department. The department coordinates 911 emergency response through the Hermiston Safety Center (pers. comm., G. Asher, Chief, Hermiston Police Department, December 7, 1993)

Police protection services in the city of Umatilla are provided by the Umatilla Police Department, which has a staff of seven police officers. Emergency 911 response is dispatched through the Hermiston Safety Center. The Police Department maintains mutual aid agreements with nearby police departments, the Umatilla County Sheriff's Department, and the State Police (pers. comm., B. Roxbury, Office Manager, Umatilla Police Department, December 1, 1993; ENSR Consulting and Engineering 1994a).

The Stanfield Police Department has a staff of 3 police officers. Emergency 911 response is provided by the Hermiston Safety Center (pers. comm., T. Wainwright, Secretary, City of Stanfield, December 1, 1993; ENSR Consulting and Engineering 1994a).

3.9.5 Fire Protection

Fire protection in the project vicinity is provided through the local communities and rural fire protection districts. The proposed project is within the Hermiston Rural Fire Protection District, and fire protection services would be provided by the Hermiston Fire Department. The department has a total of 10 full-time firefighters and 30 volunteer firefighters.

The department is equipped to handle fire and medical emergencies and is in the process of mobilizing a hazardous materials vehicle (pers. comm., R. Larson, Hermiston Fire Department, December 2, 1993; ENSR Consulting and Engineering 1994a).

The fire departments in the project vicinity rely on mutual aid agreements. These agreements, common to fire departments, allow equipment and personnel to respond to large or unique fires outside of this district. In doing so, other fire departments provide coverage for departments that have their equipment and personnel committed to an emergency.

The Umatilla Fire Department has a paid fire chief and a volunteer department with 35 volunteers. The department operates two pumper trucks and two 4-wheel brush fire trucks. The department maintains mutual aid agreements with other fire departments, including Hermiston (pers. comm., D. Drayton, Umatilla Fire Department, February 2, 1994; ENSR Consulting and Engineering 1994a).

Fire protection services are provided by the Stanfield Fire Department. The staff is made up of 18 volunteer firefighters, with are no full-time firefighters. The Stanfield Fire Department maintains formal written mutual aid agreements with Echo, Hermiston, and Umatilla Fire Departments (pers. comm., J. Whelan, Stanfield Fire Department, December 2, 1993; ENSR Consulting and Engineering 1994a).

3.9.6 Medical Services

Emergency Medical Services (EMS) are provided by some of the police and fire departments that service the project vicinity.There are two large hospitals in the area, the Good Shepherd Community Hospital in Hermiston and St. Anthony Hospital in Pendleton. The 49-bed Good Shepherd Community Hospital would be the primary facility for the project (pers. comm., K. Loveland, Public Relations Director, Good Shepherd Community Hospital, December 7, 1993; ENSR Consulting and Engineering 1994a).

3.9.7 Transportation

The main transportation linkage to the cogeneration facility is from Interstate 84 (I-84) at the Exit 182 interchange, approximately 1.6 km (1 mile) south of the site via State Route (SR) 207. All of these highways are in good condition. SR 207 is a two-lane highway (each lane 3.6 m [12 feet] wide with 0.9-m (3-foot) shoulders) and was repaved between Umatilla to south of Hermiston within the past 10 to 12 years. I-84 is a four-lane divided typical interstate and was repaved within the past 10 years. Highway 395 was expanded to 5 lanes within the past 5 years (pers. comm., D. Brice, Traffic Engineer, Oregon Department of Transportation (ODOT), Pendleton, Oregon, December 16, 1993; ENSR Consulting and Engineering 1994a).

According to the ODOT, 1991 average daily traffic (ADT) for all vehicles at SR 207 and the Umatilla River Bridge was 2,650. At SR 207 and just north of I-84, the 1991 ADT was 3,350 (ODOT 1993). The 1991 ADT along I-84, recorded approximately 0.4 km (0.3 mile) east of the I-84/SR 207 Interchange, was 5,200 (ENSR Consulting and Engineering 1994a).

Access to the cogeneration facility site would be from the existing access roads to the J.R. Simplot Potato Processing Plant. Currently, the J.R. Simplot facility generates approximately 800 daily employee vehicle trips (divided into three work shifts), and about 50 to 60 truck trips (ENSR Consulting and Engineering 1994a).

Access to J.R. Simplot is from two access roads intersecting SR 207. The main access is via an unsignalized intersection of Simplot's private road with SR 207 at the southerly end of their property. The intersection is channelized with a southbound to eastbound left turn bay that enables safe access for both Simplot employees and the 50 to 60 semi-trailer trucks that enter and exit the processing plant daily during peak operations. Secondary access is via a county road approximately 0.4 km (0.25 mile) to the north. A short north-south Umatilla County road links the northerly county road with Simplot's private road on the west side of the existing potato processing plant (ENSR Consulting and Engineering 1994a).

Additional transportation access is via the Union Pacific Railroad whose tracks run east-west along the north boundary of the potato processing plant, with a spur into the plant site. Simplot currently owns about 140 rail cars for shipment of potato products and is a key customer for Union Pacific. As the cogeneration facility construction would involve the transportation of large pieces of equipment, the proximity of the rail and Simplot's rail spur would facilitate movement of these components to the site by rail, reducing the need to transport large components by truck on I-84 and SR 207 (ENSR Consulting and Engineering 1994a).

3.10 Recreation Resources

3.10.1 Recreational Facilities

The regional setting includes a number of recreation areas that contribute to existing recreational opportunity, including Hat Rock State Park, located approximately 16 km (10 miles) northeast of the cogeneration facility; McNary Dam, approximately 16 km (10 miles) north of the cogeneration facility site; McNary Wildlife Nature Area, approximately 15.2 km (9.5 miles) north of the cogeneration facility site; and Umatilla National Wildlife Refuge and Hunting Area, approximately 25.7 km (16 miles) northwest of the cogeneration facility site (Figure 3.10-1).

Recreational opportunities within the project vicinity are limited. Informal recreational opportunities are available along the Umatilla River, which runs south of the proposed cogeneration facility site and would be crossed twice by the electrical transmission Western 230-kV Alternative. The river provides opportunities for fishing, hiking, and wildlife viewing but no hiking trails or other developed recreational facilities. However, the river does not provide unique recreational opportunities or outstanding or unusual qualities. Recreational facilities along the Columbia River are more developed than those along the Umatilla River.

Recreational facilities in the city of Hermiston include the Umatilla County Fairground, a community recreational center, and ten city parks with a total of 30.8 ha (76 acres).

The city of Stanfield operates three city parks. Total park acreage developed and undeveloped is approximately 4.1 ha (10 acres) (ENSR Consulting and Engineering 1994b).

There are no existing or planned Federal, state, or county recreation areas or facilities within the project vicinity. There are no existing or planned recreation areas or facilities traversed by the gas pipeline or transmission line routes (ENSR Consulting and Engineering 1994b).

3.11 Public Health and Safety

3.11.1 Project Materials

The proposed project would involve the use of some products and processes during construction and operation that could affect public health and safety if improperly handled. For example, both natural gas and fuel oil would be used or stored on site, both of which are flammable and can be explosive under certain circumstances. They can also be environmental pollutants if released in an uncontrolled manner. Lubricating oils, hydraulic fluids, cleaning solvents, paint, paint thinners, wastewaters from cooling tower collection sumps, and other materials and process wastes would be found on site, and could pose a risk to public health and safety if not used and disposed of properly. Some materials are classified as hazardous and would need careful handling and disposal to protect human health. Specific materials that could be used during project construction and operation are discussed in Section 3.11.

A Phase I Environmental Site Assessment study was conducted in October 1993 to assess the possibility that hazardous materials exist in the soil or underlying groundwater at the proposed cogeneration facility site as a result of prior use, or migration of pollutants from an adjacent site (Squier Associates 1993). The study found no evidence of contamination at the site and concluded that the potential for environmental impairment was very low and that further investigations were not warranted at this time.

3.11.2 Electric and Magnetic Fields

Power lines, like all electrical devices and equipment, produce electric and magnetic fields (EMF). Voltage (the force that drives the current) is the source of the electric field. Current (movement of electrons in a wire) produces the magnetic field. The strength of these fields also depends on the design of the line and on distance from the line. Field strength decreases rapidly with distance.

Electric and magnetic fields are found around any electrical wiring, including household wiring and electrical appliances and equipment. Throughout a home, the electric field strength from wiring and appliances is typically less than 0.01 kilovolts per meter (kV/m). However, fields of 0.1 kV/m and higher can be found very close to electrical appliances. Typical electric and magnetic field strengths for some common electrical appliances are given in Table 3.11-1.

Table 3.11-1. Typical Electric and Magnetic Field Strengths0.3 m (1-foot) from Common Appliances

Appliance	Electric Field (kV/m)	Magnetic Field (mG)[1]
Coffee Maker	.030	1 - 1.5
Electric Range	.004	4 - 40
Hair Dryer	.040	0.1 - 70
Television	.030	0.4 - 20
Vacuum cleaner	.016	20 - 200
Electric Blanket[2]	.01 - 1.0	15 - 100

[1] By 1 to 1.5 m (3 to 5 feet), the magnetic field from appliances is usually decreased to less than 1 mG.
[2] Values are for distances from a blanket in normal use, not 0.3 m (1 foot) away.
Source: Miller 1974, Gauger 1985

The average background magnetic field level measured in the center of rooms in 992 homes throughout the United States was 0.9 milliguass (mG) (Zafanella 1994). In 15 percent of the homes, the magnetic field level was greater than

2.1 mG. Fields very close to electrical appliances are much stronger than these levels, but appliance fields decrease in strength with distance very rapidly. Unlike electric fields, magnetic fields from outside power lines are not reduced in strength by trees and building material. Therefore, power lines can be a major source of magnetic field exposure throughout a home located close to the line. Typical electric and magnetic field strengths for some BPA transmission lines are given in Table 3.11-2.

Table 3.11-2. Typical Electric and Magnetic Field Strengthsfrom BPA Transmission Lines

Transmission Lines	Electric Fields	Magnetic Field	
		Maximum[1]	Average[2]
115-kV			
Maximum on ROW	1.0	63	30
Edge of ROW	0.5	14	7
60 m (200 feet) from Center	0.01	1	0.4
230-kV			
Maximum on ROW	2.0	118	58
Edge of ROW	1.5	40	20
60 m (200 feet) from Center	0.05	4	2
500-kV			
Maximum on ROW	7.0	183	87
Edge of ROW	3.0	62	30
60 m (200 feet) from Center	0.3	7	3

[1] Under annual peak load conditions (occurs less than 1 percent of the time)
[2] Under annual average loading conditions
Note: Above information obtained from BPA study to characterize nearly 400 transmission lines located in the Pacific Northwest.

There are no national standards for electric or magnetic fields. Some states have established EMF standards. The state of Oregon has a standard of 9 kV/m maximum on the edge of the ROW.

3.12 Visual Quality

The project vicinity consist largely of open agricultural lands, but also include industrial, commercial, and residential. More intense industrial development is concentrated north of I-84 and Highway 395, in the area of the cogeneration facility site. South of I-84, the area is characterized predominantly by agricultural lands used for grazing and crops. Development is very limited and consists primarily of rural residences and farm buildings. I-84, Interstate 82 (I-82), and Highway 395 are the major roadways traversing the 8-km (5-mile) radius. These highways offer the primary vantage points from which the public would have views of the proposed cogeneration facility.

Existing transmission lines and towers in the project vicinity are generally visible from a distance of 1.6 km (1 mile), but beyond this distance the lines and towers tend to fade into the background. Transmission lines and towers are currently a dominant feature in the northern portion of the project vicinity due to their convergence near the McNary

Dam and McNary Substation.

The Umatilla County Comprehensive Plan identifies a number of sites and vistas that are considered key scenic areas in the project vicinity. Among the key scenic areas are: Lake Umatilla, Lake Wallula, Hat Rock State Park, Cold Springs Reservoir, Wallula Gap, McKay Reservoir, McNary Lock and Dam, and Umatilla County Scenic-Historic Road. None of the key scenic areas are in the viewshed of the proposed cogeneration facility.

The Umatilla County Scenic-Historic Road, consisting of a collection of county roads, city streets, and state highways, follows the general course of early wagon roads between Umatilla and the Blue Mountains. In the Umatilla/Hermiston area, the road traverses south from U.S. Route 730 along the Umatilla River Road into downtown Hermiston. There the road travels south along the Hermiston/Hinkle Road for approximately 3.2 km (2 miles) to the intersection with Feedville Road. The road turns east along Feedville Road (which the proposed Eastern 500-kV Alternative would parallel for approximately 3.9 km [2.4 miles]) to Highway 395 and then follows this highway into Stanfield. There are currently no signs or markers indicating the location of this historical resource within the project vicinity.

The proposed cogeneration facility site is located on a 6.9-ha (17-acre) parcel of land in an industrial area of unincorporated Umatilla County. The parcel is currently used for agricultural production and is adjacent to the J.R. Simplot potato processing plant. Other industrial facilities and agricultural fields are near by.

The dominant existing visual elements of the landscape within an 8-km (5-mile) radius of the proposed cogeneration facility include the J.R. Simplot and Lamb-Weston food processing facilities, and two industrial stacks from other businesses. The J.R. Simplot and Lamb-Weston complexes each consists of a series of buildings and storage yards. The J.R. Simplot plant is located approximately 0.96 km (0.6 mile) east of SR 207, adjacent to the proposed cogeneration facility site. The Simplot plant and its steam plume are visible from portions of SR 207, and the plume is visible from Highway 395 and I-84. The Lamb-Weston facility is visible from I-84 and I-82, and its plume can be seen from SR 207. Two other industrial stacks are located east of Highway 395 near Stanfield and are visible from I-84 and Highway 395. Steam plumes rising from these stacks are highly visible.

Other existing strong vertical elements in the vicinity of the cogeneration facility include grain silos, grain elevators, and other structures used for agricultural purposes; electrical transmission and distribution lines; water towers; and stands of trees interspersed throughout the area, particularly along the Umatilla River and other water drainages.

The proposed transmission line alternatives would be located in land that is generally agricultural, commercial, or industrial. On lands near the routes are structures and facilities that give the lands agricultural, commercial, and industrial character. Vegetation is sparse along the routes and consists largely of agricultural fields, grasslands, and undeveloped lands. The proposed lines would generally follow or be located near some of the numerous existing transmission line routes that feed into the McNary Substation.

The proposed water supply line and gas lines would be primarily located in agricultural and industrial lands. Undeveloped open spaces around and between industrial and agricultural facilities, grasslands, and agricultural fields characterize the landscape the water supply and gas pipelines would pass through.

4.0 ENVIRONMENTAL EFFECTS— —HERMISTON

4.1 Geology, Soils and Floodplains

4.1.1 Geologic Impacts

Landslides

The proposed cogeneration facility site is stable as are the two alternative electrical transmission line routes and gas pipeline routes. The one possible exception is a short segment of the relocated UECA 115-kV line (Western 230-kV Alternative) near the town of Umatilla, where there are some steep slopes of loose materials in and around a gravel pit. There is a remote chance that placing electrical transmission line poles near the cut slopes could promote slope failure or the poles could be damaged if the slopes fail. However, proper engineering and careful siting of transmission poles to avoid areas of steep slopes or areas prone to slope instability will reduce or eliminate the risk of damage to transmission poles.

Erosion

It is possible that during the 30- to 40-year lifespan of the project, the meanders of the Umatilla River will continue to migrate through lateral erosion. The extent of this migration is difficult to predict without detailed monitoring, field work, or modeling. However, the PGT natural gas line route passes close enough to the Umatilla River that significant bank erosion could eventually expose the pipeline. Routine periodic monitoring of bank erosion in the vicinity of the pipeline route would allow sufficient time to relocate the pipe, if necessary, and avoid any adverse impact from erosion.

Volcanic Activity

Eruptions from the Cascade volcanoes may produce ash, lava flows, mudflows, and pyroclastic flows. However, the sources of these eruptions are sufficiently distant from the site that they pose no threat to project facilities, with the exception of major ashfall. During a moderate eruption, the total ashfall at the cogeneration facility site would be less than 5 cm (2 inches) (Waldron 1988). The effect of an ashfall at this distance from the source would be mostly a nuisance, and would not cause any structural damage to the project, although filters for industrial and car engines or other devices could get clogged.

Earthquakes

Earthquakes can affect project facilities through four mechanisms: liquefaction, groundshaking, differential settlement, and surface rupture.

Liquefaction is highly unlikely in the project vicinity. However, Holocene alluvium occurs where the electrical transmission line (Western 230-kV Alternative) crosses the Umatilla River. This alluvium is restricted to a narrow ribbon that follows the river channel and adjacent floodplain. These young river deposits are saturated and are probably susceptible to liquefaction.

The project vicinity is subject to periodic groundshaking from earthquakes. The intensity of the shaking at a particular site depends mostly on three factors: the distance between the epicenter and the site the magnitude of the earthquake and the site response characteristics of the soils and bedrock beneath the site. In general, sites underlain by loose man-made fill on unconsolidated sediments tend to suffer the greatest damage, while sites underlain at shallow depth by bedrock suffer considerably less damage.

The several feet of loose silt to fine-grained sand that blanket the cogeneration facility site and portions of the gas pipeline and electrical transmission line ROWs may be subject to differential settlement caused by earthquake-induced soil compaction.

Surface rupture is a possibility in the vicinity of the project. Final design for all project components will include seismic design and performance criteria to minimize the potential for seismic impact. Near its northern terminus, the 500-kV electrical transmission line crosses the axis of the Service anticline. Evidence of Holocene faulting has been reported on the north side of the Columbia River on the northern continuation of this anticline (Kienle 1980); therefore, there is some poorly defined risk of surface rupture in this area. The return period for surface rupture along this structure is unknown. The southern extension of the Service anticline comes within 0.8 km (0.5 mile) of the cogeneration facility site, and both gas line routes cross it. There are no apparent surface displacements in the vicinity of the site, and the anticline is concealed by flood deposits, indicating a minimum rupture age of about 13,000 years before present (BP).

4.1.2 Soils Impacts

The Quaternary sediments at the proposed cogeneration facility site and along proposed gas and electrical transmission line routes are up to 61 m (200 feet) thick. The soil profile within the sediments at the facility site is up to 2.1 m (7 feet) thick. The soil profile and the upper 0.6 to 0.9 m (2 to 3 feet) of Quaternary sediments could be subject to compaction during construction. Compaction causes a loss of fertility due to decreased aeration, infiltration, and water holding capacity. Disturbance of soils also impairs soil fertility. This occurs when a fertile topsoil layer is mixed with the relatively undeveloped subsoil. It is more difficult for native or ornamental plants to re-establish in compacted and disturbed areas.

Between 47.4 and 64.8 ha (117 and 160 acres) of soil could be affected by construction along the gas pipeline and electrical transmission line options, depending on the routes chosen. Table 4.1-1 shows the amount of soil disturbance, temporary and permanent, along with wind erosion potential, for the two gas routes and two electrical transmission line alternatives. Most disturbance would be temporary, assuming all topsoil is stockpiled and replaced after construction, and land along the proposed ROWs would not be taken out of production. Permanent disturbance along the proposed ROWs would be almost negligible (0.01 ha [0.03 acre]). Approximately 7 ha (17 acres) of soil would be permanently disturbed (taken out of potential agricultural production) at the proposed cogeneration facility site. A total of 2 ha (5 acres) of the soils is Adkins fine sandy loam (0 to 5 percent), which is considered prime farmland (SCS 1988). However, Adkins fine sandy loam is common in the region, and 2 ha (5 acres) is a relatively small area. Therefore, this does not represent a significant loss of prime farmland.

Table 4.1-1 Soils Impacts by Project Component

Project Component/ Alternative	Affected Soil Area (ha [acres])		Erosion Potential (ha [acres])		Prime Farmland (ha [acres])	
	Temporary disturbance	Permanent disturbance	Water[1]	Wind[1]	Temporary Disturbance	Permanent Disturbance
Cogeneration facility site	4.1 (17.0)	4.1 (17.0)	0.0	4.1 (10.0)	2.0 (5.0)	2.0 (5.0)

Waterline route	4.0 (9.8)	0.0	0.0	3.8 (9.3)	0.8 (1.9)	0.0
Western 230-kV Alternative[2]	43.3 (135.4)	0.0	2.4 (5.9)	37.8 (93.4)	3.0 (7.48)	0.0
			2.4 (5.9)	14.6 (36.1)	0.0	0.0
Eastern 500-kV Alternative[3]	33.8 (83.5)	0.0	1.1 (2.6)	33.8 (83.5)	16.0 (39.4)	0.0
NWP connection	21.4 (52.8)	0.0	0.0	21.1 (52.0)	9.72 (24.0)	0.0
PGT connection	9.7 (23.9)	0.0	2.3 (5.7)	9.7 (23.9)	0.0	0.0

[1] Includes soils with moderate and high erosion potential
[2] Includes UECA 115-kV Relocation
[3] Included BPA 500-kV Lower Monumental Relocation
Source: SCS 1988

4.1.3 Floodplain Impacts

Impacts to flood plains would be limited to the temporary effects of constructing the transmission lines of the Western 230-kV Alternative. These effects would be minor ground disturbance during the stringing of the wires to the poles. No practical alternative exists to siting this transmission ROW across the floodplain. Since the poles would not be located in the floodplain (see below), no modification of the floodplain would occur. Table 4.1-2 shows the total area of floodplain affected by each of the project components for each alternative. The overall impact to the floodplains, due to the temporary and limited nature of construction within the floodplains, is negligible.

Table 4.1-2. Floodplain Area Affected

Project Component	**Floodplain area affected(ha [acres])[1]**
Cogeneration facility site	0.0
Waterline route	0.0
Western 230-kV Alternative[2]	0.19 (0.46)
Eastern 500-kV Alternative[3]	0.0
NWP connection	0.0
PGT connection	0.0

[1] Note: All effects to the floodplain would be temporary, as the floodplain configuration would not be changed; assumes a 15.2-m (50-foot) construction ROW for electrical transmission lines
[2] Including UECA 115-kV line Relocation
[3] Including BPA 500-kV Lower Monumental Relocation

4.1.4 Mitigation

Many of the potential impacts associated with geological hazards and soils will be mitigated using current construction and design techniques. Specific mitigation measures include the following:

Geologic Impacts

- To avoid the risk of slope failure associated with the quarry east of the Umatilla River along a portion of the relocated UECA 115-kV route (Western 230-kV Alternative), placement of electrical transmission poles will include setbacks from cut slopes.
- Electrical transmission poles will be placed to avoid, to the greatest extent possible, the narrow strip of alluvium along the Umatilla River that may be subject to liquefaction. If this strip cannot be avoided, the transmission poles would be constructed so as to otherwise mitigate the risk of liquefaction.

Soils Impacts

- An Erosion and Sediment Control Plan (ESCP) has been developed that addresses all soils mitigation measures associated with construction of the project. This plan covers timing and sequencing of construction, placement of sediment barriers and runoff control features, and revegetation. Implementation of the ESCP will make the amount of sediment leaving construction sites negligible.
- To offset potential impacts from soil compaction, compacted areas that are left after construction will be scarified and aerated. After backfilling of the gas pipeline trench, the top 0.3 m (1 foot) of fill will not be compacted.
- Because of susceptibility of soils in the project vicinity to wind erosion, precautions will be taken during construction to minimize erosion. This will include watering all temporary and dirt/gravel access roads or covering with gravel. Also, a minimum working area will be established along the electrical transmission line and gas pipeline ROWs during construction to minimize soil exposure to wind. This will minimize the total exposed soil at any one time. Areas disturbed by construction that are not permanently occupied by plant equipment or are used for plant operation and maintenance will be revegetated upon completion of construction. Revegetation will emphasize the use of native species.
- In areas with prime farmland, topsoils and subsoils will be segregated during construction of the pipeline to minimize impacts on soil fertility. The segregated topsoils and subsoils will be replaced in the proper sequence and location to preserve soil fertility.

Floodplain Impacts

- Transmission poles will be placed to avoid the 100-year floodplain.

4.1.5 Unavoidable Adverse Impacts

Unavoidable impacts include the loss of approximately 6.9 ha (17 acres) of farmland soil to the cogeneration facility. Some of this farmland (2 ha [5 acres] in Adkins fine sandy loam) is considered prime when slopes are less than 5 percent. However, the cogeneration facility site is currently zoned for heavy industry use. In addition, some wind and/or water erosion of soils at the construction site will occur, although proper erosion control measures will reduce this impact to negligible levels. Along the 500-kV Alternative transmission line route, a maximum of 0.013 ha (0.033 acre) of farmland would be lost because of pole/tower placement. Overall, unavoidable impacts to geology and soils from the project are considered low.

4.1.6 Cumulative Impacts

Cumulative impacts on geology can result from development on unstable ground. However, the proposed cogeneration facility would be located on a nearly flat site and the pipelines and electrical transmission lines would be located on gentle slopes, with negligible chance of landslides occurring. Although the proposed project is expected to contribute to growth in the region, most sites for development in the Umatilla/Hermiston area are not subject to slope instability. Therefore, the project is considered to have a minor contribution to cumulative impacts on slope stability or other geologic resources.

Cumulative impacts to soils can result from displacement of agricultural lands or loss of soils due to erosion. The proposed cogeneration facility site would be located on land zoned for industrial use and its agricultural use would not likely be continued. The pipelines and electrical transmission lines would be located primarily in agricultural areas, but these project components would have insignificant permanent loss of land for agricultural use. Another cogeneration facility is planned to be located 4.8 km (3 miles) to the west. This facility will not eliminate significant amounts of prime farmland; however, continued development over the next several decades could decrease the total amount of available farmland or cause a shift to farming more marginal areas. However, large areas of arable land are found throughout the region, and significant displacement of agricultural lands over the project lifespan is unlikely. The proposed project would, therefore, have a low cumulative impact on soils in the region.

4.2 Water Resources

4.2.1 Water Quantity Impacts

The average water demand for the project of 7,359 lpm (1,885 gpm) represents 2.8 percent of the Port of Umatilla's allocation of 4.4 cms (155 cfs) (263,346 lpm [69,569 gpm]). Although the Port of Umatilla is not yet withdrawing water from the Columbia under its existing water allocation, the quantity of water required for the proposed project (0.12 cms [4.2 cfs]) (7,359 lpm [1,944 gpm]) is minuscule compared to the 4,808 cms (169,800 cfs) (288,490,384 lpm [76,211,334 gpm]) flow in the Columbia River at McNary. The project would increase impervious surfaces at the proposed cogeneration facility, potentially increasing runoff from the site. To control increases in stormwater runoff from the cogeneration facility site, a stormwater management system has been designed. Stormwater runoff from these areas would be conveyed into a detention basin designed to handle the 100-year, 24-hour storm event. This could result in a very small decrease in groundwater recharge, but would have a minor effect on groundwater quantity.

4.2.2 Water Quality Impacts

Land application of the 553 lpm (146 gpm) project wastewater effluent would be managed during the non-growing season to prevent nitrogen build-up because of lack of plant uptake of nutrients, and runoff of effluent over frozen ground. During the period of intermittent freezing of soil surfaces (November 16 to March 15), process water effluent incorporated into the Simplot land application system would be temporarily stored in an existing 644-million l (170-million gallon) storage pond, capable of storing the combined process water for a maximum of 113 days. The pond would store process water during the late fall and winter for reuse during the growing season.

A recent study (Cascade Earth Sciences Ltd. 1994) has shown that there is "no significant negative effect associated with the discharge of cogeneration plant wastewaters to Simplot's process water agricultural recycle system or sanitary wastewater treatment system." Furthermore regarding groundwater, "process water discharged from the cogeneration plant to Simplot's process water agricultural recycle system will result in a decline of 1.2 percent in total salt concentrations and 14 percent in total nitrogen concentrations." Based on the study data, Oregon Department of Environmental Quality (ODEQ) has approved discharge of cogeneration plant wastewaters to Simplot's system, and no adverse impacts are anticipated.

The boiler and steam turbine system present special requirements for water quality and demand special protection from corrosion and oxidation. A phosphate-polymer system would be used to control corrosion, an oxygen scavenger would be used to remove dissolved oxygen, and a neutralizing amine as morpholine would be used to control condensate pH.

For biological control an oxidizing biocide, sodium hypochlorite (NaOCl) would be used. It is a widely used commodity chemical popular for its efficiency and reasonable cost.

Caustic soda or sodium hydroxide (NaOH) is used as a corrosion inhibitor in the recirculating cooling system.

DEAE or diethylaminoethanol is widely used as a corrosion inhibitor in boilers to protect piping and metal surfaces in steam distribution systems. In this application, it is referred to as a "neutralizing amine" since it neutralizes carbonic acid which corrodes metal surfaces in steam and condensate systems.

Nitrite, Molybdate, Tolyltriazole, and Polycrylate polymer would be used as corrosion inhibiters in the closed cooling water system that would not be part of the discharge.

Sodium metasilicate, sodium hydroxide, and sodium tetraborate be used as corrosion inhibitors in the cooling water system. These chemicals are diluted and are consumed in small quantities, at low rates and will be FDA approved because some of the steam would be used in the J.R. Simplot potato plant.

The cogeneration wastewater would be mixed with the effluent from the J.R. Simplot potato processing plant and applied to existing acreage now being used for wastewater land application.

The J.R. Simplot Company applied for an amendment of its current Water Pollution Control Facilities (WPCF) permit (No. 100518) to the Oregon Department of Environmental Quality, Water Quality Division on November 18, 1994 to allow incorporation of HPP cogeneration effluent.

ODEQ determined that HPP demonstrated through application of appropriate process controls, that the HPP cogeneration facility would be capable of generating process wastewater, which for select wastewater parameters, would be substantively equivalent in characteristics to potato process wastewater currently treated and disposed by Simplot under the WPCF permit.

ODEQ approved the amendment of J.R. Simplot's WPCF permit to allow land application of wastewater from HPP's cogeneration facility on November 30, 1994.

No additional treatment of wastewater would be required.

The project would store and use a number of chemicals that, if spilled or otherwise accidentally released, could potentially contaminate local and regional surface waters and underlying aquifers. Mitigation measures included in project design and recommended in this EIS would protect surface and groundwater from spill contamination, as further discussed in Section 4.11 (Public Health and Safety).

Water quality in the Umatilla River at the two Western 230-kV Alternative river crossings could be adversely affected by erosion and sedimentation during construction. Mitigation measures and design features are further discussed in Section 4.1 (Geology, Soils, and Floodplains).

4.2.3 Mitigation

The following measures will be implemented to mitigate potential impacts to water quantity and quality:

- The project design will incorporate a number of water conservation measures including dry NO_x control, reduced cooling water drift, and effluent process water management.
- Effluent from the plant will be used for crop irrigation which will reduce the amount of water drawn from area aquifers for irrigation.
- A comprehensive construction stormwater management plan will be prepared to prevent erosion or sedimentation from potential construction runoff.
- The fuel oil, ammonia, and sulfuric acid tanks will have secondary containment using impermeable liners and surrounded by dikes. Additionally, The sulfuric acid storage area enclosed by the dike will be partially filled with coarse limestone to passively neutralize any leakage from the tank. Other chemicals stored outside in tanks will also have secondary containment to control any spills.
- In the event of a spill, all fluids in the containment area will be inspected to determine if they contain hazardous materials. If any hazardous materials are in the containment area, they will be removed and treated/disposed of in an appropriate manner according to applicable regulations.

4.2.4 Unavoidable Adverse Effects

The proposed project would require an average water withdrawal of 0.12 cms (4.2 cfs) (7,135 lpm [1,885 gpm]) from the Columbia River, already accounted for in the Port of Umatilla's water rights allocation. The average flow of the Columbia River at McNary is approximately 5,600 cms (200,000 cfs) (339,800,216 lpm [89,766,000 gpm]). Therefore, this withdrawal would have a minor impact on the quantity of water remaining in the river to support other uses. Properly managed land application of the project's wastewater (as planned) will likewise have a minor impact on surface or groundwater quality. Therefore, impacts to water resources are considered low.

4.2.5 Cumulative Impacts

The proposed project water use would contribute incrementally to local and regional cumulative impacts associated with water withdrawals from the Columbia River. Locally, two other power generation facilities are under construction: (1) the Coyote Springs Cogeneration Project in Morrow County near the town of Boardman, and (2) the Hermiston Generating Project 4.8 km (3 miles) east of the proposed project.

The Coyote Springs project would consume approximately 0.16 cms (5.6 cfs) (9,513 lpm [2,513 gpm]), supplied by either: (1) Port of Morrow groundwater wells, which the Oregon Department of Water Resources has determined are hydrologically connected to Columbia River flows (Energy Facility Site Council [EFSC] 1994); or (2) water from the Columbia River through water rights secured by the Port of Morrow and the city of Boardman. The Port of Morrow is currently petitioning for additional groundwater rights.

The Hermiston Generating Project would consume approximately 0.11 cms (3.8 cfs) (6,458 lpm [1,706 gpm], supplied from the Port of Umatilla's Columbia River allocation.

Permitted water rights in the vicinity of the three projects are not currently being used to the maximum extent. Actual water usage will increase if these plants come on line, and impacts to regional water resources beyond current conditions may result.

The Port of Umatilla holds a water right for withdrawing 4.4 cms (155 cfs) (263,346 lpm [69,569 gpm]) from the Columbia River. The cumulative impacts to the Port of Umatilla's supply from the Hermiston Generating Project and the proposed project's use of 0.229 cms (8 cfs) (13,593 lpm [3,591 gpm]) would be about 5 percent of the Port's allocation. This would be a low cumulative impact on the Port's water supply.

The withdrawal of an average 0.12 cms (4.2 cfs) (7,135 lpm [1,885 gpm]) for the proposed cogeneration facility could result in the potential loss of electrical energy generation at four downstream Columbia River Federal power projects McNary, John Day, The Dalles, and Bonneville particularly in the low flow months of August through January when all flow would normally be routed through the turbines at one or more of the projects. On average, the withdrawal would reduce generation by about 756 megawatt hours (MWh) annually, or about 0.0023 percent of the annual 32.8 million MWh output of the four projects. The generation foregone due to the withdrawal would need to be replaced by BPA through increased generation at other projects or increased power purchases. The revenue loss of the foregone generation would be about $20,000 annually. The effects on BPA rates in absorbing this revenue loss would be real, but imperceptible to the consumer. Similar effects would be attributable to the Hermiston Generating Project and Coyote Springs projects, and other water withdrawals. Each would very slightly reduce the quantity of water remaining in the river to support other uses.

4.3 Air Quality

4.3.1 Construction Impacts

The primary sources of air pollution during the construction phase of the project would be equipment exhaust from construction vehicles, and fugitive particulate matter emissions. Construction-related exhaust emissions would result from operation of heavy equipment and from construction workers' vehicles used to travel to and from the construction site. Fugitive emissions would be generated by bulldozing and grading vehicles traveling on disturbed ground, and wind erosion. Site excavation and grading activities would disturb on-site soils and would result in loose dirt and silt which could become airborne when subject to a moderate or strong wind and/or when moved during construction-related activities.

The amount of pollutants emitted from construction vehicles and equipment and construction worker commute traffic would be small compared to total vehicular emissions in the region. Short term emissions from construction sites are exempt from any air quality permitting requirements.

4.3.2 Criteria Pollutant Emissions

The proposed cogeneration facility would include two natural gas fired turbines operating in combined cycle mode, with two HRSGs and two steam turbines. The HRSG would be a duct fired, natural circulation, three pressure, reheat design. The cogeneration facility would employ Best Available Control Technology (BACT) for NO_x, volatile organic compounds (VOCs), carbon monoxide (CO), particulate matter, and toxic compounds to minimize air emissions from the gas turbines. The duct burners would occasionally be used to add heat to the HRSG when additional steam or electricity production is required. Exhaust gas from each turbine would pass through the HRSG and the Selective Catalytic Reduction (SCR) unit, and would be vented to the atmosphere. The stacks would meet Good Engineering Practice (GEP) height requirements to eliminate the potential for aerodynamic downwash of emissions caused by adjacent or nearby buildings. Cooling water for the condensers would be supplied from a cooling tower. Vendors for the cogeneration facility components have not yet been chosen.

The EPA and ODEQ require that all new sources of air emissions with the potential to emit significant quantities of air pollutants undergo a rigorous permitting process. Facilities classified as major new or modified sources (i.e., emitting more than 91 MTY [100 TPY] of any air pollutant) are subject to New Source Review (NSR). The ODEQ has regulatory authority responsible for review of Air Contaminant Discharge Permits and Prevention of Significant Deterioration (PSD) applications. The proposed project would emit NO_x in excess of 91 MTY (100 TPY) and is therefore subject to PSD review. The proposed project must demonstrate the employment of BACT through a control technology evaluation, demonstrate compliance with air quality standards and PSD increments, assess the project consequences on soils, vegetation, growth, and visibility in the PSD Class I areas, and perform a BACT and impact analysis for emissions of hazardous air pollutants.

The proposed project would generate air pollutants from the combustion of natural gas in each of two identical combustion turbines. The facility would at times be required to operate at less than full load. BPA has stipulated that the facility be able to operate at reduced load when the demand for electrical power drops. Reducing the load requires less fuel and reduces emissions of pollutants directly correlated with the quantity of fuel combusted (NO_x and particulate matter). However, at reduced load, emissions of pollutants related to efficiency (CO and VOCs) may increase.

In the event of natural gas curtailment, low sulfur No. 2 distillate oil would be used as a backup. Fuel oil would be used no more than 378 hours per year while operating both gas turbines at full load. Supplemental duct firing would not occur while fuel oil was being burned. During oil burning NO_x emissions would be controlled by the use of water injection and the SCR.

Best Available Control Technology

As a major new source of air emissions, the proposed project would be required to demonstrate that air emissions will be controlled to the extent which is economically and technologically feasible. The demonstration of this control is referred to as BACT. EPA recommends the "top down" evaluation process for BACT analyses. This approach ranks all available control technologies in descending order of control effectiveness. The most stringent or "top" alterative is examined first; this alternative is established as BACT unless the applicant demonstrates to the satisfaction of the permitting authority that technical, energy, environmental, or economic considerations justify a less stringent technology. If the most stringent technology is eliminated, then the process is repeated for the next most stringent alternative.

For the proposed project, BACT design information will be documented in the air permit application and reviewed by the ODEQ. The proposed controls for the project are summarized in Table 4.3-1.

Table 4.3-1. Proposed Control Technologies

Pollutant	Proposed BACT
NO_x Natural Gas Firing Fuel Oil Firing	 Low NO_x combustors with SCR Water injection and SCR
CO	Good combustion control
SO_2	Low sulfur bearing fuel
VOC	Good combustion control
PM_{10}	Good combustion control, use of fuel with low ash content
Toxics	Good combustion control, use of fuel with low ash content

Source: EMCON 1994a and 1994b

The use of low-NO_x burners followed by SCR for additional NO_x reduction are considered BACT for the project. For steady state operations at full load, NO_x emissions will be limited to 4.5 parts per million by volume (ppmv). For changing loads and partial load operations, NO_x emissions will be limited to 6 ppmv. The use of SCR requires the use of ammonia. Secondary emissions due to ammonia slip are guaranteed by the SCR manufacturer to be less than 10 parts per million by dry volume (ppmdv). Control of ammonia slip from the project will be accomplished with adequate mixing and proper combustion control. During oil combustion, water injection and SCR will be used to control NO_x emissions.

CO and VOC emissions will be minimized by controlling the parameters that affect formation of these pollutants, including the amount of excess oxygen, flame temperature, residence time, and combustion zone design. Good combustion control does not result in increased emissions of other pollutants and is considered BACT for the project. The use of natural gas as a fuel is considered BACT for particulate matter and sulfur dioxide (SO_2). Emissions of toxic air pollutants (TAPs) are related to particulate matter and VOC emissions and will be minimized by the same control techniques as these pollutants.

The proposed project will be operated with the control equipment in accordance with vendor recommendations and generally accepted practices to prevent excessive emissions and to minimize fuel consumption.

Modeling

Maximum air quality emission concentrations from the project were predicted using dispersion models that assumed, maximum emissions, and worst-case meteorology. (The project is currently gathering site-specific air quality and meteorological data which will be used in a permit application for backup fuel oil.) The COMPLEX1 and Industrial Source Complex Short Term (ISCST2) models were used in the analysis (EPA 1986, 1992). Dispersion is influenced by local terrain, short-term meteorological conditions, and the influence of buildings near the stack. The ISCST2 model was used to predict concentrations at receptors whose elevation is less than the height of the plume (1,300 feet msl). COMPLEX1 was used to predict concentrations at elevations greater than the elevation of the top of the stack (800 feet msl). Receptors located at elevations between the top of the stack and the height of the plume were modeled with both ISCST2 and COMPLEX1, and the larger predicted concentration was used in the analysis. The COMPLEX1 and ISCST2 models address these features and their use is recommended by EPA (EPA 1993).

The models require emission rates as part of the input data. The modeled emission rates were based on the pollutant-specific potential to emit presented in Table 4.3-2. Additional input data, including the stack exit velocity and temperature, were based on engineering data. The modeling predicted project-related concentrations in simple, elevated, and complex terrain that surrounds the cogeneration facility site. The models predicted maximum 1-hour concentrations, which were converted to averaging periods corresponding to the AAQS by multiplying by the following factors (ODEQ 1993b):

Averaging Period	Simple Terrain	Complex Terrain
8-hour	0.7	0.75
24-hour	0.4	0.25
Annual Average	0.08	0.08

Table 4.3-2 Maximum Project Emissions (Potential to Emit)

Turbine	Pollutant (MTY [TPY])				
	NO_x	PM_{10}	CO	SO_2	VOC
Natural Gas	313.7 (345.8)	69.2 (76.3)	715.5 (788.8)	4.9 (5.4)	39.0 (43.0)
Fuel Oil	27.8 (30.6)	23.1 (25.5)	100.1 (110.4)	30.8 (34.0)	3.1 (3.4)
	341.4 (376.4)	**85.6 (94.4)**	**815.7 (899.2)**	**35.7 (39.4)**	**42.1 (46.4)**
Federal Significant Emission Rate	36 (40)	14 (15)	91 (100)	36 (40)	36 (40)

Source: EMCON 1994b

Maximum predicted criteria air pollutant concentrations resulting from project emissions are presented in Table 4.3-3 for emissions from both turbines. The predicted concentrations are less than the AAQS or the PSD Class II increments, and the De Minimis monitoring levels.

Table 4.3-3 Predicted Air Pollutant Concentrations

Pollutant	Maximum Concentrations (mg/m^3)	AAQS (mg/m^3)	PSD Increment (Class II) (mg/m^3)	De Minimis Monitoring Levels (mg/m^3)	Oregon SILs (mg/m^3)
PM_{10} (annual)	0.238	50	17	-	0.21
PM_{10} (24-hour)	8.3	150	30	10	1.01
CO (8-hour)	76	10,000	-	575	500
CO (1-hour)	108	40,000	-	-	2,000
NO_2 (annual)	0.747	100	25	14	1

[1] **Federal Significant Impact Levels are 1.0 mg/m^3 for the annual average and 5.0 mg/m^3 for the 24-hour average.**
Source: EMCON 1994b

The maximum predicted 24-hour and annual average PM_{10} concentrations are greater than the Oregon SILs for fuel oil firing. The maximum predicted 24-hour PM_{10} concentration is greater than the Oregon SIL for natural gas and fuel oil firing, and greater than the Federal SIL for fuel oil firing. Operational restrictions would be imposed to maintain the 24-hour PM_{10} concentrations less than the Oregon SILs. The proposed project would restrict its operation in such a way that the annual NO_2 concentration would remain below 1.0 mg/m^3. The proposed project will restrict its use of duct burners during periods when the ambient temperature is above 29°C (85°F).

Dispersion modeling was conducted for a number of combinations of ambient temperature and operating load. Maximum concentrations would occur for a variety of emission and ambient conditions. CO and VOC emissions would be greatest for reduced loads; NO_x, SO_2, and PM_{10} emissions would be greatest for full load. Annual average concentrations should be predicted for average meteorological conditions. Cooler temperatures produce greater exit velocity and higher plume rises, maximizing concentrations in elevated terrain. Summer conditions favor maximizing concentrations at lower elevations. Maximum concentrations were predicted for 100, 80, and 60 percent load, and temperatures that represent two winter conditions, an average daily condition, an annual average condition, and a summer condition. Annual average concentrations were predicted using the annual average temperatures, emission, and from natural gas and fuel oil firing for base load conditions. The location of the maximum predicted concentrations are in the elevated terrain to the east-southeast through the west-southwest from the proposed site, at distances of 9 to 14.5 km (5.6 to 9 miles) from the site.

The proposed project would also be a source of TAPs. Annual emissions of ammonia would be greater than 9.1 metric tons (10 tons). Therefore, dispersion modeling was required to determine the ambient concentrations of the TAPs. TAP emissions were modeled following the same methodology used for the criteria pollutants. The maximum possible emissions were modeled using worst-case meteorological data. The predicted concentrations were then adjusted by application of multiplication factors. The maximum 1-hour concentrations predicted by ISCST2/COMPLEX1 hybrid model BEEST-X were multiplied by 0.4 and 0.08 to obtain 24-hour and annual average concentrations, respectively (ODEQ 1993b). Concentrations of representative TAPs were compared to the Oregon SILs. Maximum predicted TAP concentrations are less than the Oregon SILs (Table 4.3-4).

Table 4.3-4 Ambient Concentrations of Toxic Air Pollutants

Toxic Air Pollutant	Averaging Time	Concentration (mg/m^3)	
		SIL	Predicted
Gas Fired			
1,3-Butadiene	Annual	0.036	0.002
Ammonia	24-hour	360	4.33
Benzene	Annual	1.2	0.01
Formaldehyde	Annual	0.8	0.018
Sulfuric Acid	24-hour	10.0	2.46

Source: EMCON 1994b

Turbines and control equipment for four manufacturers are being evaluated for the Hermiston Power Project. Each of the turbines has different projected emission rates. To evaluate the consequences of operating the cogeneration facility on Hermiston air quality, maximum annual emission rates for each pollutant were chosen from four sets of emissions data. Maximum emissions for the project (Table 3.4-2) are based on the following assumptions:

- SO_2 emissions are based on a natural gas sulfur content of 2 grains per standard cubic foot, and fuel oil sulfur content of 0.05 percent by weight.
- All particulate matter are assumed to have an aerodynamic diameter of less than 10 microns (PM_{10}).
- The SCR reduces NO_x emissions by 76 percent.
- Annual NO_x emissions include 8,382 hours of natural gas firing at 100 percent load with supplemental duct firing, and 378 hours of oil firing without duct firing.
- CO emissions are based on firing at 100 percent load for 6,922 hours with duct firing, 60 percent load for 1,460 hours without duct firing, and fuel oil firing at 100 percent load for 378 hours without duct firing.

Estimated emissions would exceed the significant emission rates for NO_x, PM_{10}, CO, and VOCs. Thus, the project would be considered a major new source and is subject to PSD review. The air quality impact analysis considers only these criteria pollutants.

Construction of the project's buried and overhead transmission lines would result in the generation of fugitive dust and exhaust from the construction equipment. These short-term localized emissions are not subject to regulatory review and would result in small ambient air quality concentrations. The application of water to the access roadways during construction by spray trucks will minimize fugitive dust. There would be no direct emissions to the air resulting from the operating transmission lines.

4.3.3 Emissions of Toxic Air Pollutants

Toxic air pollutants are formed as part of the combustion process and are emitted in small quantities along with the exhaust flow. Small quantities of ammonia are also emitted as a result of ammonia slip from the treatment of NO_x in the SCR. If the quantity of TAPs emitted by the facility is greater than emission rates specified by ODEQ, dispersion modeling is required to demonstrate that ambient concentrations of the pollutants are less than threshold levels.

Toxic emissions from gas- and oil-fired turbines and the gas fired duct burners were estimated using VOC and particulate matter specification tables from the California Air Resources Board (CARB 1991). Maximum potential emissions of toxic air pollutants are based on base load with duct firing. Emissions of TAPs are presented in Table 4.3-5. Emission rates for ammonia, sulfuric acid, benzene, formaldehyde, and 1,3-butadiene are expected to be greater than the Oregon significant emission rates.

Table 4.3-5 Toxic Air Pollution Emission Rates

Pollutant	Units	Emission Rate	Significant Emission Rate
Ammonia	lb/8hrs	282	31.0
Sulfuric Acid	lb/8hrs	161	2.0
Benzene	lb/yr	3,366	3,100
Cyclohexane	lb/8hrs	0.61	1,920
Formaldehyde	lb/yr	6,309	2,000
Hexane (all isomers)	lb/8hrs	0.64	3,210
N-Butane	lb/8hrs	6.44	3,500
Pentane (all isomers)	lb/8hrs	9.67	3,300
Toluene	lb/8hrs	1.16	685
1,3-Butadiene	lb/yr	826	93.0
Antimony	lb/8hrs	0.01	0.9
Arsenic	lb/yr	0.62	6.0
Beryllium	lb/yr	0.62	0.8
Cadmium	lb/yr	0.62	14.0

Chromium	lb/8hrs	0.01	0.9
Cobalt	lb/8hrs	0.079	0.09
Copper	lb/8hrs	0.01	2.0
Lead	lb/yr	0.31	1,200
Mercury	lb/8hrs	0.01	0.09
Nickel	lb/8hrs	0.01	0.2
Selenium	lb/8hrs	0.01	0.4
Tin	lb/8hrs	0.03	0.09
Vanadium	lb/8hrs	0.03	0.09

Source: EMCON 1994b

4.3.4 Effects on Class I Areas

Visibility

The visibility in the atmosphere may be affected by emissions of particulate matter directly into the air, by the presence of NO_2 gas, and by secondary aerosol formation from SO_2, sulfate (with two additional electrons; SO_4^{2-}), NO_x, and CO emissions. PSD air quality regulations also require the evaluation of visibility impairment for the Eagle Cap and Strawberry Mountain Wilderness Areas. Visibility impacts related to the project were also evaluated for the Columbia River Gorge National Scenic Area, located 180 km (112 miles) west of Hermiston.

Visibility degeneration resulting from project emissions was assessed using the EPA visibility model VISCREEN, following the guidance provided by EPA (1988) for a Level 1 analysis. The VISCREEN model estimates the contrast between the plume and the background, and the plume perceptibility (color difference) parameter, DE, which is a function of difference in brightness, color hue, and saturation. The contrast and DE parameters are calculated separately for sky and terrain backgrounds. The model considers different sun angles and plume/viewer angles, and determines the maximum possible visibility impact. The Level 1 analysis uses worst-case meteorology.

The visibility analysis used conservative estimates for all parameters, including maximum emission rates from the project, the minimum distance to each Class I area, and very stable turbulence conditions (stability class F, wind speed equal to 1 m/second). The emission plume was modeled with the following background visual ranges:

Eagle Cap Wilderness Area	167 km (104 miles)
Strawberry Mountain Wilderness Area	175 km (109 miles)
Columbia River Gorge National Scenic Area	160 km (99 miles)

Visibility degradation resulting from project emissions was predicted for an observer within each Class I area viewing a vista inside the park or wilderness area, and for an observer inside each Class I area viewing a distant vista outside of the park or wilderness area. Results of the analysis predict no adverse impacts on visibility degradation within the Class I areas. In all cases, the largest impact was for a visitor looking outside the park, observing the plume from the cogeneration facility against a sky background. The largest impacts were for the Eagle Cap Wilderness Area (DE =

0.671 and contrast = 0.007) and were much smaller than the screening criteria (DE = 2.0, contrast = 0.05).

Deposition

The Class I areas are most sensitive to the effects of sulfur and nitrogen compounds. Based on the available data, the maximum deposition rate for sulfur compounds that can be tolerated by most terrestrial ecosystems is 20 kilograms (kg)/ha/year (44.1 pounds/acre/year). Adverse effects are very unlikely below 5 kg/ha/year (11 pounds/acre/year) (U.S. Department of Agriculture 1992). For areas that contain sensitive lichen species, 5 to 15 parts per billion by volume (ppbv) is the annual average SO_2 concentration that is considered adverse. Injury from nitrogen deposition is not expected if NO_x deposition is less than 3 kg/ha/yr (6.6 pounds/acre/year) and the daily ambient NO_2 concentration is less than 15 ppbv.

The potential for sulfur and nitrogen deposition was evaluated by modeling emissions following the same methodology used for criteria air pollutants. Modeling was performed for receptors placed at the elevation of the plume at the Class I area boundary nearest to the project. Modeling predicted maximum 1-hour ambient concentrations that were converted to other averaging periods by multiplying by 0.25 and 0.08 to obtain 24-hour or annual average concentrations, respectively. Maximum predicted concentrations in the Eagle Cap and Strawberry Mountain Wilderness Areas resulting from project emissions are much less than the PSD Class I increments (Table 4.3-6).

Table 4.3-6 Maximum Predicted Concentrations in PSD Class I Areas

Location	**Pollutant**	**Averaging Period**	**Maximum Predicted Concentration (mg/m^3)**	**PSD Class I Increment (mg/m^3)**
Eagle Cap Wilderness Area	PM_{10}	24-hour	0.199	10
		Annual	0.006	5
	NO_2	Annual	0.011	2.5
	SO_2	3-hour	0.0103	25
		24-hour	0.0046	5
		Annual	0.0003	2
Strawberry Mountain Wilderness Area	PM_{10}	24-hour	0.183	10
		Annual	0.005	5
	NO_2	Annual	0.020	2.5
	SO_2	3-hour	0.0119	25
		24-hour	0.0053	5
		Annual	0.0006	2

Source: EMCON 1994b

Sensitive vegetation in the Wilderness Areas may be damaged by elevated concentrations of nitrogen, sulfur, or ozone. This aspect of the analysis compares concentrations of SO_2 and NO_2 in the Class I areas to limits suggested by the U.S. Department of Agriculture (1992). The proposed project would primarily combust natural gas, thus minimizing SO_2 formation. Total emissions of SO_2 and VOCs are below the significant emission limits and would not affect the Eagle Cap and Strawberry Mountain Wilderness Areas. Only NO_x emissions from the cogeneration facility are appropriate for evaluating potential soils and vegetation impacts.

Maximum modeled 24-hour NO_2 concentrations in the Wilderness Areas (Table 4.3-7) are very small (less than 0.1 percent) and would have a negligible effect on trees and herbaceous plants. Because SO_2 and VOC emissions from the cogeneration facility would be below the significant emission levels, the effect on lichens and bryophytes would also be negligible.

Table 4.3-7 Predicted Concentrations in Class I Areas

Location	Pollutant	Averaging Period	Maximum Concentration (ppbv)[1]	Suggested Limits (ppbv)
Eagle Cap Wilderness Area	SO_2	Annual	-	5
	NO_2	24-hour	0.0128	15
Strawberry Mountain Wilderness Area	SO_2	Annual	-	5
	NO_2	24-hour	0.0105	15

Source: EMCON 1994a
[1] ppbv - Parts per billion by volume

4.3.5 Cooling Tower Plume Effects

Unusable excess heat from the project would be dissipated to the atmosphere by the evaporative cooling towers. Air leaving the cooling tower is warmer than the surrounding air, and is saturated with as much moisture as it can carry. As the air mixes with the surrounding atmosphere, it cools and loses its ability to carry the moisture that it gathered in the cooling tower. The moisture then condenses into liquid water droplets that form a visible plume. As the plume is carried downwind, the liquid water droplets will evaporate and the plume will gradually disappear. If the ambient air is saturated, a fog or cloud will already exist and the cooling tower plume will not have a visible impact other than that which is already present.

The potential impacts from a cooling tower plume are as follows:

- The condensed water droplets are visible and can obscure or impair the view from locations in the vicinity of the cogeneration facility site.
- The plume can create a ground shadow that can create a loss of incoming solar energy for some croplands immediately adjacent to the facility.
- Some of the water droplets may contact the ground before being re-evaporated, causing a slight increase in

precipitation at locations immediately adjacent to the combustion turbine facility site.

- During certain wind conditions, the cooling tower plume can become bent over and create a localized fog that may impair driving conditions.
- When a bent-over plume contacts the ground during freezing conditions, a layer of ice may form on surfaces including roadways and powerlines.
- A small quantity of droplets, referred to as drift, comprised of water that was not evaporated from the cooling tower and subsequently recondensed. The drift contains impurities found in the cooling water including dissolved salts, metals, and algae growth suppressants. These impurities will be deposited when the drift droplets evaporate in ambient air.

An evaluation of the impacts expected to result from the linear mechanical draft cooling tower plume was conducted (Heydarpour 1994). The analysis utilized the SACTI model (Argonne National Laboratory 1984) and 5 years of meteorological data from Pendleton, Oregon. The SACTI model predicted the visible plume length frequency, the number of hours of ground icing, the number of hours of plume fogging, and the amount of drift deposition.

The SACTI model predicted that visible plume would occur, but the frequency of long plumes would be very small (Figure 4.3-1). Maximum plume lengths would be on the order of 3,900 m (12,795 feet) with a frequency of 1 percent, and plume lengths less than 1,300 m (4,265 feet) would occur 90 percent of the time. Cooling tower plume lengths of 1,400 m (4,593 feet) or more would occur at a frequency of 10 percent of the hours per year. Pictorial examples of typical and worst-case plume lengths are presented in Figure 4.3-2 for winds parallel and perpendicular to the cooling towers.

The number of hours of fogging, and icing were also predicted by the SACT1 model. Fogging resulting from operation of the cooling towers affects an area located in the east-northeast through south directions from the site (Figure 4.3-3). Two hours per year would produce fogging conditions for the Simplot access roads. No fogging is predicted for major transportation routes in the area of the CT facility site. For the 5 years of meteorological data analyzed, no hours of icing were predicted for distances greater than 400 m (1,312 feet) from the cooling tower. Only a few hours of icing were predicted for 1 out of 5 years of data analyzed, for an area to the south of the towers (Figure 4.3-4).

Salt deposition patterns for the area surrounding the cooling tower were predicted by the SACTI model. Assuming a dissolved solids concentrations of 0.0052 g per gram of solution, the highest salt deposition rate, 0.287 g/square m per month, occurs at a location 200 m (656 feet) to the east of the cooling tower (Figure 4.3-5). This level of deposition is not expected to have an adverse environmental impact.

4.3.6 Mitigation

The project will be required to demonstrate that emission controls meet the requirements for BACT. BACT is required in attainment areas for major new sources, and is the highest and most efficient control level consistent with energy, environmental, and economic factors for the facility. The method of evaluating BACT requires the developer to submit information on a complete range of technologies for each pollutant, and to choose the best technology unless substantial reason exists to preclude it (e.g., not commercially available). Control technologies in the proposed project design (described previously in Section 4.3.1) are among the most stringent emissions controls available for combustion gas turbines.

HPP will implement prudent measures to minimize construction related dust and emissions, including the following:

- The construction contractor would be directed to water all exposed soil surfaces twice each day during dry weather. Frequency of watering could be increased on days when blowing dust is visible.
- Stored construction materials that could be a source of dust would be covered.
- Vehicles speeds in the construction area would be limited to minimize dust in the area.
- Truck beds would be covered when they are transporting dirt/soil.
- To reduce combustion pollutants, idling construction equipment would be shut down, where feasible, and low

NO_x emission tune-ups on equipment operating on site for more than 60 days would be performed.

4.3.7 Unavoidable Adverse Impacts

The project would emit combustion by-products to ambient air. As stated in Section 4.3.1, concentrations resulting from project-related emissions would be less than applicable local, state, and national AAQS. Furthermore, project-related emissions would result in concentrations in the PSD Class I areas that are less than the guidance values. Table 4.3-5 indicated that the maximum 24-hour project-related PM_{10} concentration is greater than the ODEQ SIL. This concentration is predicted to occur during periods when the ambient temperature is greater than 32·C (90·F), and when the project is operating at less than 100 percent load. The developer is willing to limit operation of the project to 100 percent load without duct burners when ambient air temperatures reach or exceed 29·C (85·F). With these restrictions, emissions from the project are not expected to exceed the SILs, and are less than the AAQS. Air quality impacts resulting from the proposed project are considered low.

4.3.8 Cumulative Impacts

The cogeneration facility would consist of two units, with no anticipated additional units. The Coyote Springs Cogeneration Project is located near the city of Boardman, Oregon, and would emit up to 472 MTY (520 TPY) of NO_x and 465 MTY (513 TPY) of CO (BPA 1994a). The Hermiston Generating Project is located 4.8 km (3 miles) southwest of the city of Hermiston, Oregon, and would emit up to 247 MTY (272 TPY) of NO_x and 406 MTY (447 TPY) of CO (BPA 1994b). The maximum ambient concentrations resulting from emissions from each of the three projects will be below the Oregon DEQ significant impact levels (SIL). The SILs were selected specifically to ensure that pollutant concentrations below the SILs would not cause a region with acceptable air quality (in attainment) to become unacceptable (non-attainment). Concentrations below the SILs are considered negligible. Total concentrations resulting from emissions from all three projects will also be insignificant. Air quality related values for the PSD Class I areas resulting from emissions from the three projects are also low. Cumulative impacts resulting from all three projects would be less than the recommended values. Any additional sources of air emissions would be subject to regulatory review and would have to demonstrate that their emissions will result in ambient air pollution concentrations that are less than the AAQS. If concentrations resulting from these new sources are greater than the significance levels, the air quality impact analysis would have to include an evaluation of emissions from existing facilities, including the proposed project.

4.4 Noise

4.4.1 Construction Noise

The noise levels produced by construction activities would vary widely, depending on the specific equipment being operated at the time. Construction activities are excluded from ODEQ noise ordinances (OAR-340-35-035). Figure 4.4-1 shows typical sound level ranges for construction equipment that may be used for this project.

4.4.2 Cogeneration Facility

Noise would emanate from the HRSG, stacks, generator building, cooling tower, and transformers. ODEQ has established allowable noise levels from industrial facilities. The nighttime L50 criteria would be the most stringent noise standard applicable to this project (Table 5.16-1). In addition, new industrial sources are limited to noise level increases at sensitive receptors to 10 dB(A) over the minimum hourly ambient levels. For the nearest residence, the minimum hourly ambient L50 is 44 dB(A). Sound modeling was performed to determine if project-related sound levels in the areas immediately surrounding the cogeneration facility would be less than ODEQ's limits.

The individual plant components that would contribute to the total project-related noise are the following:

- Gas turbine air intake
- Turbine building
- HRSG casing
- Stack outlet
- Cooling towers
- Electrical transformers

Modeling was based on the two-unit configuration (worst case). Combustion air cooling chillers are proposed for the facility, and would operate during periods of high ambient air temperatures. These units would not operate at night when the ambient temperature will be cooler, and were therefore not included in the modeling. Electrical transformer noise from the substation would be at least 10 dB(A) below the noise from the cogeneration facility, and would not contribute to the overall noise levels at the nearest residences. Electrical transformer noise was therefore not included in the modeling.

EPA does not have enforceable noise limits applicable to industrial operations, however, EPA Region 10 has published general guidance for noise assessments (EPA 1980). Increases in the Leq above the existing conditions are evaluated by the following criteria:

- An increase of 0 to 5 dB(A) is considered a slight impact
- An increase of 5 to 10 dB(A) is considered a significant impact
- An increase of greater than 10 dB(A) is considered a very serious impact

Modeling was used to predict maximum noise levels at the nearest residence locations, south of the cogeneration facility site along Umatilla Meadows Road. The design ambient noise level is the minimum L50 noise level of 44 dB(A). The ODEQ nighttime L50 equal to 50 dB(A) would also apply to the project. This requires that the cogeneration facility noise does not exceed 48 dB(A). The maximum predicted plant noise level is 48 dB(A). The dominant components of the overall predicted noise are the turbine air inlet and the cooling towers.

Most of the recreational facilities within the project vicinity are located within the city of Hermiston, approximately 4.8 km (3 miles) north of the proposed cogeneration facility site. Because of the proposed project's distance from these facilities, noise from construction and operation of the proposed project would be inaudible.

Fishing and other informal recreational opportunities located within 0.4 km (0.25 mile) of the project, along the Umatilla River, would be within audible range of the cogeneration facility. However, the site is located in an existing industrial area with existing elevated noise levels, and is approximately 1.6 km (1 mile) north of I-84; therefore, project noise would not result in a significant increase in ambient noise levels at this location.

Transmission Line and Substation

The transmission lines and substation would generate some noise, but would not exceed existing background levels.

4.4.3 Mitigation

The developer will undertake the following noise mitigation measures to comply with the L50 nighttime noise limit of 50 dB(A) at all residential locations:

- Install silencers in the combustion turbine air inlet duct.
- Minimize low frequency resonance from the steam generator and stack through good engineering design.
- Include noise barriers in the cooling towers.

The following construction sound abatement measures will be included in the project construction specifications to mitigate construction sound impacts:

- Construction will not be performed on Sundays, legal holidays, or between 10 p.m. and 6 a.m. on other days, except when night construction is necessary for continuous construction processes.
- All construction equipment will have sound devices no less effective than those provided on the original equipment. Equipment will not be operated with unmuffled exhaust systems.
- Pile driving or blasting operations, if required, will not be performed on Sundays, legal holidays, or between 8 p.m. and 8 a.m. on other days.

4.4.4 Unavoidable Adverse Impacts

Although the modeled noise levels caused by the proposed project are lower than the ODEQ night-time limits and EPA Region 10 guidelines, it is possible that noise from the facility will be slightly audible at some of the residential areas at night when the background sound levels are low. The cogeneration facility could be audible above traffic noise only at locations immediately adjacent to the site. Because the planned mitigation measures would attenuate project-related noise to acceptable levels, unavoidable adverse impacts from noise are considered low.

4.4.5 Cumulative Impacts

Other proposed industrial projects in the Hermiston region would cause no significant cumulative noise impacts. The modeled noise increases caused by the cogeneration facility decrease rapidly with distance from the site. At present there are no other proposed industrial projects within 5.2 km (2 miles) of the Hermiston cogeneration facility. Cumulative noise impact from the project is considered low.

4.5 Vegetation/Wetlands

4.5.1 Cogeneration Facility

Because the proposed site of the cogeneration facility is currently cultivated cropland, no environmental effects involving upland or wetland/riparian resources are anticipated. Approximately 7.7 ha (19 acres) of cropland will be affected by construction of the facility (Table 3.6-1). Approximately 6.9 ha (17 acres) will be permanently converted to an industrial use by the facility. Construction staging activities will temporarily disturb 0.8 ha (2 acres). The land will be restored to cropland once construction has been completed.

4.5.2 Gas Pipelines

Construction of the 1.7 km (4.1 mile) PGT pipeline could affect areas of shrub-steppe, grass/forb, riparian/deciduous, wetland, and open water habitats, and cropland (Table 3.6-1). Most of this construction would take place in or adjacent to existing railroad and road rights-of-way.

Though the placement of the PGT pipeline would be designed to avoid wetland areas, irrigation-ditch riparian habitats may be temporarily disturbed along the route. This disturbance could include vegetation clearing, trench excavation and backfilling, equipment trafficking, and water quality degradation (due to potentials for increased sedimentation and potential hydrocarbon spills). In all cases, these impacts will be temporary. Permanent impacts may involve altered hydrological patterns in shallow subsurface and surface water, as might be caused by slight changes in topography due to construction and disturbance activities. Such changes in surface or shallow groundwater flows could result in a change in vegetation or wetland functions. Filling (that is, trenching) of riparian habitats during construction of the PGT route would result in a temporary loss of riparian functions and values. Riparian habitats would be restored as soon as construction is complete.

In three of the four wetlands associated with this corridor (#'s 1, 2, and 3 [Figure 3.5-1]), the pipeline route would be positioned to avoid any impacts to these wetlands. However, within wetland #4, the planned PGT pipeline corridor would require the fill of the small inlet 27 sqm (300 square feet). The fill is necessary because the pipeline route is constrained on the north by a steep sandy slope, presenting construction safety problems, and the pipeline route is constrained on the south by the wetland. The proposed fill will not violate state water quality standards. The placement of fill would occur where the water is less than one foot deep. Construction controls would be exercised during fill operations to prevent turbidity increases in the balance of the wetland.

There are no significant impacts expected in wetland #4 from the proposed fill. The inlet at wetland #4 offers minimal functions and values because of poor quality water concentrated at that point, and significant water-borne vegetation is not present. Habitat for wildlife at the boundary of the inlet, is probably not utilized because of the odor associated with the incoming water. Sediment trapping and nutrient removal probably occurs in the inlet, although to a much lesser extent than in the body of the wetland which is much larger and contains vegetation such as cattail. There is little opportunity to revegetate the disturbed portion of this wetland since the disturbance would be a permanent fill. However, the edge of the fill can be vegetated. Willows disturbed during the fill process at this site could be carefully dug up with a backhoe to gather the entire tree/shrub (including root-ball). They could then be set aside and protected from hot, dry weather. Once the pipeline has been installed, the willows and their root-balls could be placed along the upper edge of the waterline. Willows often resprout after being transplanted. If portions of the tree/shrub die back as a result of transplant shock, the structure would function as wildlife hiding cover and bird perching structure until full re-growth of the tree/shrub.

Cattails in the area to be filled could be salvaged prior to filling, and then placed along the water side of the filled area. Again, cattails could be salvaged using a backhoe, and then spread over the water side of the fill area. The toe of the fill slope could be seeded with mostly basin wildrye (Elmus cinereus) as well as the native seed mix used for the upland areas.

An alternative to the planned PGT pipeline corridor would route the pipeline to the south of Wetland #4. This corridor would transfer a significant portion of the route from industrial land which is presently open, to farm land which is presently cultivated. This corridor would also be in the Umatilla River flood plain, with the associated construction, environmental, and safety concerns. Therefore, this alternative corridor between the project site and the interconnection point is considered not practicable.

Another alternative to the planned PGT pipeline corridor to the interconnection near Stanfield would route the pipeline to the north of the steep sandy slope. At the crest of this slope an for a distance north, the land is occupied by the Hinkle Rail Yards, one of the largest such installations in the country. The rails at the crest of the slope, which would have to be crossed twice in order to utilize this route, are the UPRR main line. The hazards and complexities of constructing and operating a gas pipeline under such an intense industrial site outweigh the environmental considerations at wetland #4.

Any route to an alternative connection location to the main PGT pipeline would involve a crossing under the Umatilla River and floodway.

Construction of the 3.6 km (8.8 mile) NWP pipeline would affect areas of shrub-steppe vegetation and cropland (Table 3.6-1). Most of this construction would take place in or adjacent to existing gas transmission and road ROWs. No wetlands would be affected.

For both PGT and NWP pipeline construction projects combined, less than a total of 0.4 ha (1 acre) of these habitats will be permanently affected. Permanent impacts would be associated with the fill described above in Wetland #4, and with aboveground appurtenances such as corrosion test points and vent pipes. All temporarily disturbed locations would be revegetated at the completion of construction.

4.5.3 Electrical Transmission Line

Eastern 500-kV Alternative

Approximately 26.1 km (16.2 miles) of new transmission line construction will be required if the Eastern 500-kV Alternative is chosen. Approximately 21.9 km (14.8 miles) of this construction will be along existing roads and within existing BPA electrical transmission corridors, but will cross shrub-steppe vegetation and grass/forb, riparian, wetland, pasture, and cropland vegetated habitats (Table 3.6-1). Only 0.9 km (0.6 mile) will cross open vegetated terrain not associated with roads or existing ROWs. Temporary access roads will be used during construction, but all temporarily disturbed areas will be revegetated when construction is completed. No permanent access roads will be constructed. Routine maintenance and patrolling activities will be conducted from existing roads. Thus, permanent impacts for this alternative are also associated with the pole or tower placements. Total permanent impacts are expected to be less than 0.4 ha (1 acre) for steel poles, and 0.68 ha (1.69 acres) for towers. All attempts will be made to place poles or towers outside of wetland and riparian habitats.

In five of the seven wetlands associated with this route (#'s 14, 16, 17, 18, and 19 [Figure 3.5-1]), placement of poles would avoid any impacts to these wetlands. However, at wetlands #13 and 15, minor unavoidable impacts are expected to occur from pole placement. Near wetland #13, an existing transmission line would be rerouted. Wetland #13 in this area occupies a ditch alongside Lind Road south of Highway 730. The ditch at this location would be temporarily replaced with a culvert to maintain flows. An angle pole would be placed on the present transmission line route so the conductors can be moved to new poles placed along Lind Road. Wetland #13 would not be directly impacted by the pole, but because of the proximity of the pole to the wetland, the temporary fill of about 27 sqm (300 sq. feet) during construction would be unavoidable.

An alternative location for the pole is impracticable, since a pole must be placed at the angle point of the route, and one leg of the route is already in place. The other leg of the route is located at the edge of a road right-of-way along an existing transmission line, the route of lowest impact to the McNary substation. Also, moving the new route further to the east would introduce transmission line impacts to an area not presently impacted.

There are no significant impacts expected in wetland #13 from the proposed temporary 27 sqm (300 sq foot) fill. Wetland functions and values offered by this wetland are habitat for wildlife, sediment trapping, and food chain support. The functions and values associated with this wetland would not be significantly affected by the proposed fill, and the fill would not affect any drinking water sources, or any surface waters.

With respect to wetland #15, the planned 500-kV transmission line route through wetland #15 is on the same alignment as an existing 230-kV transmission line. The new transmission poles would carry both the 500-kV circuit and the 230-kV circuit. Thus, the route would still have only one set of transmission line structures, and these structures would be changed from double pole wood structures to single pole steel structures. The number of poles would be reduced from the present number of 6 wood poles, to two steel poles within the wetland. Placement of the new poles in wetland #15 would temporarily disturb about 540 sqm (6,000 sq feet) and permanently displace about 9 sqm (100 sq feet).

Other routes for the 500-kV line would not consolidate the two circuits onto one set of poles, and would thus have increased impacts relative to the proposal. Similarly, moving the line to any alternative corridor would 'break new ground' and introduce a transmission line into areas not presently impacted.

There are no significant impacts expected in wetland #15 from the proposed transmission pole erection. Wetland functions and values offered by the wetland near the proposed pole locations are habitat for wildlife and food chain support. The loss of 9 sqm (100 square feet) of this habitat is insignificant in consideration of the presence of the many acres of wetland present within a short distance of the pole locations.

Western 230-kV Alternative

Approximately 18.4 km (11.5 miles) of new transmission line construction would be required if the Western 230-kV Alternative is chosen. Approximately 17.6 km (11 miles) of this construction will be along existing roads, but would cross shrub-steppe vegetation and grass/forb, riparian, wetland, open water, pasture, and cropland vegetated habitats (Table 3.6-1). Less than 1 km (0.5 mile) would cross open terrain not associated with roads or existing ROWs. Temporary access roads would be used during construction, but all temporarily disturbed areas would be revegetated when construction is completed. No permanent access roads would be constructed. Routine maintenance and patrolling activities will be conducted from existing roads. Thus, permanent impacts are associated with the pole placements. Total permanent impacts are expected to be less than 0.4 ha (1 acre). Because poles will be placed outside of the ten wetland and riparian habitats associated with this route (wetland #'s 5, 6, 7, 8, 9, 10, 11, 12, 20, and 21 [Figure 3.5-1]), no significant impacts are expected to these resources.

4.5.4 Water Supply Pipeline

The water supply pipeline would be approximately 1.8 km (1.1 miles) long and would cross cropland and shrub-steppe vegetation (Table 3.6-1). All disturbed areas would be revegetated when construction is completed. No significant permanent or temporary impacts to upland vegetation or wetland/riparian habitats are expected from construction, operation, use, or maintenance of the water supply pipeline.

4.5.5 Mitigation

Most of the impacts associated with construction and maintenance of project components will be limited to terrestrial habitats. Because current Federal and state regulations require that impacts to wetland communities be avoided whenever possible, impacts to wetland and riparian habitats will be avoided, or minimized by the use of appropriate design, appropriate construction techniques, and revegetation practices.

The 270 sqm (3,000 square feet) of temporary impacts to wetland #15 would recover on its own if measures are taken to avoid soil compaction during construction. First, construction would occur during the driest period of the year (July through October). Second, wide tract equipment would be used, causing less soil compaction than rubber tire equipment. Another option is to use road felt and then cover the felt with gravel, in essence creating a temporary pad. Once the construction has been completed the gravel can be removed, and the felt rolled up and removed. In addition, any native topsoil removed during construction would be stockpiled and replaced in the disturbed area at the completion of pole placement, serving as a seed source for natural revegetation processes.

Revegetation methods would be conducted during the wettest months (generally October through February) for optimum results. Grass seeding can be started in September but completed by late October to take full advantage of the winter precipitation. Disturbed upland areas would be assessed just prior to seeding for any pre-seeding treatment needed to reduce dense noxious weed growth which could hinder the reseeding effort.

Tree/shrub planting can occur at any time during the wet period. Revegetation and wetland mitigation for the Project would be implemented and completed within a maximum of nine months from the completion date of the transmission line and natural gas pipeline construction.

The 9 sqm (100 square feet) of permanent impact to wetland #15, and the 27 sqm (300 square feet) of impact to wetland #4, totalling 36 sqm (400 square feet) for the two wetlands, require mitigation in addition to the revegetation methods discussed in this section. There are several types of possible mitigation: restoration, creation and enhancement. Restoration is proposed at a 1 to 1 ratio (equal portions of restored to disturbed) and is the type of mitigation proposed for most of wetland #15. The second type of mitigation, creation, would be performed at a 1.5 to 1 ratio. Since the Project does not own any land this type of mitigation is not proposed. The third type, wetland enhancement, is proposed at a 3 to 1 ratio. The 37.2 sqm (400 total square feet) of permanent wetland impacts at wetlands #4 and #15, which would require 111.5 sqm (1,200 square feet) of wetland enhancement.

Enhancement would include planting shrub cuttings and rooted shrub stock. Cuttings can be collected from the willows local to the area, and then planted near the wetter portions of wetland #15. In addition, Douglas hawthorn (Crataegus douglasii) and rose (Rosa sp.) could be planted at densities equivalent to 6 and 4 foot centers respectively. The combined area for the willow, hawthorn and rose plantings should be 108 sqm (1,200 square feet). Planting of these species should result in a greater diversity of habitat available for wildlife. The following mitigation measures will be implemented.

- Wetlands #1, #2, and #3 near the PGT gas pipeline will be avoided by placing the pipeline away from the wetlands.
- Implementation of the project's ESCP will include erosion and sedimentation controls to protect water quality and sensitive areas.
- Temporarily disturbed areas will be restored to their near-original grade and seeded with desirable erosion control species.
- In wetland and riparian habitats, the construction ROW will be minimized to minimize impacts to these habitats. Construction will also be attempted during the dry season. Hydric soils will be stockpiled and then used to backfill the pipeline trench in the correct sequence. The revegetation plan in these habitats emphasizes the use of native plant species suitable for erosion and sedimentation control and desirable wildlife habitat.
- Construction of project components will comply with state and local permits that regulate construction in general, and those permits that specifically regulate construction in wetlands, riparian areas, and other sensitive areas.
- The project will be coordinated with EFSC, the Corps, and other appropriate agencies to develop additional acceptable mitigation measures.

The following informal monitoring program may be established to gauge the success of the revegetation efforts.

1. In July or August of the year following the initial fall grass seeding or other plantings, a qualified surveyor would visit a representative cross-section of revegetated sites. Care would be taken to survey areas in all the major habitat types and throughout the geographic extent of the impact area.
2. At each site, the surveyor would record, on a separate data sheet, qualitative and quantitative estimates of several factors, including species composition, stand vigor, total acreage of the site, amount of noxious weed invasion, amount of soil erosion, etc. Additional observations regarding wildlife use and other indirect factors used to gauge the success of the plantings would also be collected.
3. The location of each survey site would be noted in sufficient detail to allow the site to be relocated at a later date.
4. Each site would be resurveyed for two additional summers following the initial survey.
5. Following each year's survey, the results would be evaluated based on expected establishment rates for the area. If the success of the plantings falls significantly below desired levels, additional seedings or plantings may be necessary.

4.5.6 Unavoidable Adverse Impacts

Approximately 6.9 ha (17 acres) of cropland will be permanently converted to an industrial use by construction of the cogeneration facility. In addition, less than 0.4 ha (1 acre) of non-wetland (but as yet undetermined) habitat would be permanently converted to an industrial use by above-ground appurtenances of the gas and water supply lines. This is considered an unavoidable, low impact. For the Western 230-kV Transmission Line Alternative, construction of new poles would permanently impact less than 0.1 ha (0.2 acre) of shrub-steppe, grass/forb, riparian, wetland, pasture, and/or cropland vegetated environments. For the Eastern 500-kV Alternative, construction of new poles would permanently impact less than 0.4 ha (1 acre) of vegetation, while new towers would about 0.68 ha (1.69 acres). These are considered unavoidable, but low, impacts.

Acreage estimates for temporary impacts to each habitat type caused by construction of project facilities are not yet available. Certainly, vegetation will be temporarily cleared during construction of the gas, electrical, and water transmission lines, and therefore functionally lost until sufficient time passes for similar vegetation to become established. Because no unique vegetation will be cleared, and because environmental restoration will be implemented, temporary vegetation clearing is considered an unavoidable, but low, impact.

These unavoidable impacts to upland vegetation are considered to be generally low because the upland vegetation to be disturbed or displaced (primarily disturbed shrub-steppe, grass/forb, pasture, and cropland habitats) is common in the vicinity of the proposed project and because habitat restoration measures will be implemented by the developer.

4.5.7 Cumulative Impacts

All of the habitat types disturbed by the project are prevalent throughout this portion of Oregon and in the vicinity of the project. Because of this, the project is considered to have a low cumulative impact on vegetation, riparian, and wetland resources. The temporary and permanent disturbances to these habitats are considered minor; locally and regionally.

4.6 Wildlife and Fisheries Resources

4.6.1 Wildlife Habitat Disturbance and Conversion

Cogeneration Facility Site

Construction of the cogeneration facility would eliminate 6.9 ha (17 acres) of cropland (Table 4.6-1). Approximately 0.8 ha (2 acres) of adjacent cropland will be temporarily disturbed as a staging area. Upon completion, the facility will occupy 4 ha (10 acres), 2.8 ha (7 acres) will be landscaped and the 0.8-ha (2-acres) staging area converted back to cropland (letter from E. Clark, Hermiston Power Partnership, September 1, 1994). This would reduce foraging habitat for western meadowlarks, red-winged and Brewer's blackbirds, red-tailed hawks, and killdeer. Given the proximity to the heavily disturbed J.R. Simplot Potato Processing Plant, this impact is expected to be minor. Although no nesting was documented during field surveys (NWS 1994b), construction during the spring or summer could potentially eliminate nests of the ground-nesting species.

Electrical Transmission Lines

Eastern 500-kV Alternative. The Eastern 500-kV Alternative (including the BPA 500-kV Lower Monumental Relocation) would result in the permanent habitat loss of <0.1 ha (<0.2 acre) from placement of new poles spaced approximately 304.8m (1,000 feet) along the existing ROW, paralleling the "H" structure poles that are already present, and new poles on the relocated McNary-Lower Monumental ROW and between the cogeneration facility and Canal Road (Table 4.6-1). If towers are constructed instead of poles, the permanent loss of 0.68 ha (1.69 acres) would result. Most of the habitat affected by the project would be cropland, as 21.9 km (13.6 miles) of the 22.8-km (14.2-mile) newly constructed ROW would be in this type (letter from E. Clark, Hermiston Power Partnership, September 1, 1994). Although there are several wetlands on the ROW, including the McNary-Roundup route, impacts to wetlands would be minimized, as the developer plans to avoid all wetlands. However, the Eastern 500-kV transmission may potentially require a pole in wetland No. 13, located 1 km (0.5 mile) south of the McNary Substation (letter from E. Clark, Hermiston Power Partnership, September 1, 1994. An additional 4.5 ha (11 acres) of habitat (mostly cropland and degraded grassland) would be temporarily disturbed for work areas, staging areas, and access roads during construction; however, all disturbed areas would be revegetated immediately. The permanent and temporary loss of habitat would primarily affect species that rely on shrub-steppe, croplands and grasslands for foraging and nesting. These species include the long-billed curlew (documented on and near the ROW near the Power City Wildlife Area), killdeer, western meadowlark, horned larks, and grasshopper and savannah sparrows. Mammals that would be temporarily affected would include coyotes and northern pocket gophers. The two Swainson's hawk nests along this alternative would not be affected.

Western 230-kV Alternative. The Western 230-kV Alternative (including the UECA 115-kV Relocation) would utilize mainly existing poles, but will involve approximately 6 km (3.5 miles) of new construction between the cogeneration facility site and the Westland Substation (letter from E. Clark, Hermiston Power Partnership, September 1, 1994). Also, approximately 12.8 km (8 miles) of new construction would be required for the relocated segment of the UECA 115-kV route. Less than 0.1 ha (<0.2 acre) of wildlife habitat would be permanently eliminated, while an additional 4.2 ha (10.5 acres) habitat would be temporarily disturbed (Table 4.6-1). Most of the habitat disturbance would occur in grasslands and croplands along roadways. This route crosses the Umatilla River; however, no impacts to the riparian and wetland wildlife habitat are expected. The 230-kV Alternative route would not affect the important long-billed curlew and grasshopper sparrow nesting and foraging area, located just west of the route, on the Umatilla Ordnance Depot since existing poles and conductors would be used. The relocated UECA 115-kV route would affect mainly cropland and degraded grassland habitat. This is considered a low impact.

Table 4.6-1. Effects on Habitats from Hermiston Power Project

Project Component	Disturbance Areas			Habitat Types Affected
	Total ha (Acres)	Temporary ha (Acres)	Permanent ha (Acres)	
Cogeneration Facility	7.7(19)	0.8(2)	6.9(17)	cropland
Western 230-kV Alternative[1]	4.49 (11.1)	4.25 (10.5)	0.04 (0.1)	cropland, grassland, sagebrush, rabbitbrush
Eastern 500-kV Alternative[2]	4.53 (11.2)	4.45 (11.0)	0.06 (0.16)	cropland, grassland, rabbitbrush, sagebrush, bitterbrush, pastureland
PGT Pipeline	7.98 (19.7)	7.94 (19.6)	0.02 (0.06)	sagebrush, grassland, cropland
NWP Pipeline[2]	16.1 (39.7)	16 (39.6)	0.02 (0.06)	grassland, cropland, rabbitbrush, sagebrush
Water Supply Pipeline[1]	1.9 (4.8)	1.9 (4.8)	0	cropland, sagebrush

[1] Includes the UECA 115-kV Relocation. If the 230-kV Transmission Line and Water Supply Pipeline are both selected, the shared ROW would reduce the total temporary disturbance area from 4.01 to 3.8 ha (9.9 to 9.3 acres) 20.3 to 19.5 ha (50.1 to 48.1 acres).
[2] Includes the BPA 500-kV Lower Monumental Relocation. If the 500-kV Transmission Line and pipeline to NWP are both selected, the shared ROW would reduce the total temporary disturbance area from 20.3 to 19.5 ha (50.1 to 48.1 acres).

All transmission lines would be designed with adequate spacing between insulators to reduce the potential collision and electrocution hazard for raptors.

Natural Gas Lines

PGT Gas Line. The PGT route extends along the top of an embankment to the north of the Umatilla River, and parallels a railroad track. This 6.6 km (4.1-mile) route would result in the permanent loss of <0.1 ha (<0.1 acre) of habitat and the temporary disturbance of 7.9 ha (19.6 acres) of wildlife habitat, including mostly degraded sagebrush shrub steppe habitat (Table 4.6-1). Construction may affect sagebrush the small areas of grassland habitat (primarily non-native species) present along the route (NWS 1994b; letter from E. Clark, Hermiston Power Partnership, September 1, 1994). Small inclusions of native grass species present in the sagebrush habitat may be affected during construction. The route approaches several riparian areas and two wetlands along the river, but no construction activities would take place within these habitats; implementation of proper erosion and sediment control measures during and after construction would ensure that they are not indirectly affected. Construction would not affect the one osprey and two Swainson's hawk nests or the four bank swallow nesting colonies along the Umatilla River, which are all within approximately 0.4 km (0.25 mile) of the route. Wildlife species affected by habitat disturbance along this route include the western meadowlark, horned lark, and other sagebrush and grassland species commonly found in the vicinity.

NWP Gas Line. The NWP route, which would share the Eastern 500-kV Alternative ROW from the cogeneration facility to Canal Road, would permanently affect 0.2 ha (<0.1 acre) of wildlife habitat (Table 4.6-1). Construction would temporarily affect 16 ha (39.6 acres) which would be revegetated. Most of the wildlife habitat that would be disturbed is degraded grassland and cropland, although some rabbitbrush and sagebrush would also be affected.

Construction of the pipeline may temporarily reduce habitat for long-billed curlews and grasshopper sparrows, both documented along the eastern 4.8-km (3-mile) portion of the ROW (NWS 1994b).

Water Supply Line

The water supply line would be placed in the same ROW as the Western 230-kV Alternative transmission line between the cogeneration facility and Feedville Road. Placement of the water supply line would temporary disturb 1.9 ha (4.8 acres) of wildlife habitat, primarily cropland and non-vegetated land adjacent to the highway. This temporary loss of habitat is not expected to cause any major impacts to wildlife due to the already disturbed nature of the area.

4.6.2 Construction and Operation Disturbance to Wildlife

The proposed project would create a notable disturbance to wildlife during construction and other ground-disturbing activities. General disturbance would be greatest during the construction period due to the use of heavy equipment, traffic, and increased human activity. These disturbances are likely to displace wildlife over the course of the activities. Additionally, required periodic vegetation maintenance along the gas pipeline ROW during project operation would also temporarily displace wildlife for a short duration (see Chapter VI, Appendix B, Biological Assessment).

4.6.3 Impacts to Sensitive Wildlife Species

Federally Listed Species

The bald eagle is the only Federally listed threatened or endangered species documented in the project vicinity. Potential effects to the bald eagle include: (1) loss of roosting or perching sites, (2) effects on food supplies, (3) disturbance to wintering eagles, and (4) electrocution from transmission lines (see Chapter VI, Appendix B, Biological Assessment).

The 1.6-km (1-mile) segment of the Umatilla River just upstream from the cogeneration facility site provides low quality roosting structures, and some foraging opportunities; however, the existing noise level is relatively high in this area. Bald eagle habitat quality increases and disturbance decreases farther upstream near the PGT gas connection point, 6.4 km (4 miles) upstream from the cogeneration facility site. Habitat along the river near the PGT connection point is rated as high quality (NWS 1994a). A small number of eagles use the river during the winter between the cogeneration site and the PGT connection point (NWS 1994c). Cottonwood and alder trees provide important perch sites and waterfowl, fish, and livestock carrion are important prey items during the winter. Eagles have also been observed along the Eastern 500-kV Alternative route near Power City Wildlife Area wetlands and in croplands/pasture near the Western 230-kV Alternative route 4.8 km (3 miles) south of Umatilla (NWS 1994c). In upland areas, eagles likely forage on carrion and small mammals, between November and March.

The small number of bald eagles, the only threatened or endangered species documented to normally occur in the project vicinity, would not be affected by the project for the following reasons: (1) no suitable roost or perch sites would be removed, (2) no food supplies would be affected, (3) wintering eagles would not be disturbed since construction will be minimized during the winter near suitable habitat along the Umatilla River and operation noise levels would be constant and just slightly greater than the ambient noise level near the existing potato processing plant, and (4) new transmission lines would be constructed have sufficient separation between insulators to minimize risk of electrocution.

Federal Candidates and State Species of Special Concern

The long-billed curlew (a Federal Candidate Category 3 and ONHP species of concern), Swainson's hawk (a Federal Candidate Category 3, ODFW state vulnerable), grasshopper sparrow (a species whose status in the state is undetermined), painted turtle (ODFW state critical), and northern sagebrush lizard (a Federal Candidate Category 2 and ODFW state sensitive-vulnerable) are the Federal candidate and state sensitive species potentially occurring in the project area near the construction ROW. The three bird species require open grassland, shrub-steppe, and croplands for foraging and have been observed throughout the area. Curlews and grasshopper sparrows require open grasslands and shrub-steppe for nesting, while Swainson's hawks nest in scattered trees in the area. The northern sagebrush lizard requires gravelly soil in shrub-steppe habitat. Construction of the project would temporarily affect foraging habitat for curlews and grasshopper sparrows and northern sagebrush lizard. However, impacts would be temporary and abundant habitat is available nearby. No Swainson's hawk nesting habitat and no painted turtle habitat would be affected.

4.6.4 Wildlife Mitigation

The following measures would be implemented to mitigate potential impacts to wildlife and habitat:

- Avoid all wetland habitats where possible.
- Retain native vegetation as much as possible in the impact areas to preserve wildlife habitat and provide a buffer of vegetation for surrounding habitat areas.
- Replant disturbed habitats with native vegetation to reduce duration of habitat disturbance. In areas requiring maintenance, plant native grassland species that need less frequent maintenance than native pioneer shrubs.
- Minimize construction work in most sensitive areas (Power City Wildlife Area section of Eastern 500-kV Alternative, CRP section of NWP Gas Line, the entire PGT pipeline, and the Western 230-kV Alternative crossing of the Umatilla River) during the spring-early summer breeding season and the winter bald eagle season.
- Contact USFWS and ODFW prior to start of construction to update the list of endangered, threatened, or candidate species of wildlife. If there are any new species listed, coordinate any possible mitigation measures with the appropriate agencies.

4.6.5 Unavoidable Adverse Impacts to Wildlife

The amount of temporary disturbance and permanent conversion of wildlife habitats from project implementation depends on the chosen electrical transmission alternative. The Western 230-kV Alternative would result in the temporary disturbance of 4.3 ha (10.5 acres) and permanent conversion of 0.04 ha (0.1 acres) of cropland, grassland, sagebrush, and rabbitbrush (Table 4.6-1). The Eastern 500-kV Alternative would impact varying amounts of the same habitat types, but the total area impacted would be 4.5 ha (11.0 acres) of temporary habitat disturbance and 0.06 ha (0.16 acres) of permanent habitat conversion. However the total amount of temporary disturbance could be reduced, if the chosen electrical transmission corridor could be shared with another ROW (Table 4.6-1).

The largest single habitat to be effected by the project would be 6.9 ha (17 acres) of cropland at the cogeneration facility site. The PGT pipeline would impact a total of 7.9 ha (19.7 acres), whereas the NWP pipeline would impact a total of 16.1 ha (39.7 acres). As proposed, none of the project component options would impact any wetlands or riparian vegetation.

Temporary disturbance from project construction would likely displace wildlife during the period of those activities. These disturbances would most likely be short term, with the exception of the cogeneration facility where complete inundation of the wildlife habitat would permanently displace any species currently residing there. Displacement of wildlife would periodically occur along the gas and water pipeline ROWs because of required vegetation maintenance.

Overall, given the temporary nature of habitat disturbance, the relatively small amount of wildlife habitat that would be affected, and the planned mitigation measures, the proposed project is considered to have low impacts to wildlife and their habitats.

4.6.6 Cumulative Impacts to Wildlife

In the recent history of the project vicinity, the major impact to wildlife has been the conversion of shrub-steppe and grassland habitat to irrigated cropland. The amount of habitat available to wildlife has been decreasing and fragmenting, resulting in smaller populations and isolated gene pools. Because the cogeneration facility site is already cropland and other components as proposed would result in only a small amount of habitat loss and temporary disturbance, the direct contribution of the proposed project to regional cumulative impacts on wildlife habitat would be low.

The proposed project, and the two other cogeneration projects currently under development in the area, would contribute marginally to the continued growth and development in the Hermiston/Umatilla area and subsequent loss of additional wildlife habitat.

4.6.7 Fisheries Impacts

A withdrawal of 0.12 cms (4.2 cfs) (7,135 lpm [1,885 gpm]) represents 0.002 percent of the average annual flow of 4,808 cms (169,800 cfs) (288,490,384 lpm [76,211,334 gpm]) at McNary Dam and 0.004 percent of the average low flow of 3,030 cms (107,000 cfs) (181,793,116 lpm [48,024,810 gpm]). While it is generally accepted that higher flows in the Columbia River system increase salmon and steelhead smolt survival, the range of benefit estimates vary considerably and some data even indicate that higher flows reduce smolt survival (Cada et al. 1993). Some studies have derived regression equations to estimate the effects of flow changes on fish survival, including migrating steelhead and spring chinook (for example, see McConnaha 1990, cited by Cada et al. 1993). All of the studies in the lower Columbia have examined the effects of flow over a range of at least 2,832 cms (100,000 cfs) (169,900,108 lpm [44,883,000 gpm]); estimates of the benefits of even a 283 to 566 cms (10,000 to 20,000 cfs) (33,980,022 lpm [8,976,600 gpm]) change in flow are very small. The impact on fish of withdrawing 0.12 cms (4.2 cfs) (7,135 lpm [1,885 gpm]) in this region of the river would be so small as to be unmeasurable. It would constitute a negligible impact on the salmon and steelhead resources.

Of the two electrical transmission line alternatives, only the Western 230-kV Alternative involves stream crossings. This route crosses the Umatilla River in two locations: (1) where new 230-kV conductor will be added to existing UECA poles, from Feedville Road across the river to the Westland Substation; and (2) where the relocated UECA 115-kV route crosses the river just east of the city of Umatilla in the vicinity of Highway 82. The second crossing (UECA 115-kV relocation) may involve removing some riparian trees in the ROW where it crosses the Umatilla River. Riparian trees are important for providing shade to control water temperatures and supplying future large woody debris, an important component of stream fish habitat formation. However, the crossing is already disturbed from previous construction and the vegetation loss would be small, resulting in negligible impact to fisheries.

The endangered and threatened Snake River salmon stocks, the Federal-candidate margined sculpin, and the Federal-candidate pacfic lamprey would be unaffected by this project. Although water would be withdrawn from the Columbia River, the quantity is too small to have any effect. Also, the National Marine Fisheries Service (NMFS) will require the Port of Umatilla to properly screen this facility to protect all anadromous stocks within the region. Therefore, no impingement or entrainment would occur from the proposed project's water requirements.

4.6.8 Fisheries Mitigation

Recommended mitigation includes ensuring that proper erosion and sedimentation control and hazardous substance control procedures are followed on the Umatilla River bank slopes during and following the transmission line construction.

4.6.9 Unavoidable Adverse Impacts to Fisheries

There would be no unavoidable adverse impacts on fisheries resources from the proposed project.

4.6.10 Cumulative Impacts to Fisheries

In addition to the proposed project, two other combustion turbine projects are currently under development in the area. One of the two other projects (Hermiston Generating Project) would also purchase water from the Port of Umatilla's water supplyWater supply system, at the rate of approximately 0.12 cms (4.2 cfs) (7,135 lpm [1,885 gpm]). The third project, the Coyote Springs project in Morrow County, requires approximately 0.2 cms (5.6 cfs) (9,513 lpm [2,513 gpm]), purchased from the Port of Morrow, which also draws from the Columbia River. The cumulative withdrawal from the proposed project would add slightly to the existing competition for water on the Columbia River, and therefore the impact from the proposed project is low.

4.7 Land Use

4.7.1 Impacts to Existing Land Uses

Cogeneration Facility Site

The cogeneration facility would be constructed on a 6.9-ha (17-acre) site currently used for alfalfa production. Construction of the cogeneration facility would permanently remove these lands from agricultural production.

The cogeneration facility would have the greatest effect on land use of all the project components, but would be consistent with adjacent industrial and agricultural land uses and comprehensive plan designations. The facility site is zoned heavy industrial, so the facility would be a permitted use by Umatilla County. During construction, the project would result in minor inconveniences caused by increases in noise, dust, and traffic; however, these effects are not considered significant. During operation, the plant, with mitigation, would not be expected to result in land use incompatibilities. Although the cogeneration facility would intensify the industrial character of the area near it, it would not cause significant land use conflicts with nearby uses, nor would it be adversely affected by the operations associated with these uses.

Transmission Line

Eastern 500-kV Alternative. Approximately 33 ha (83 acres) along the 26.4-km (16.5-mile) long route would be temporarily disturbed during the installation of the transmission line. Upon completion of the installation, all but 0.69 ha (1.7 acres) would be returned to the original condition. There are 115 residences located within 152 m (500 feet) of the proposed transmission line route. These residences would experience minor and temporary impacts during construction, including noise and dust generated by construction vehicle activity, and possible minor travel delays from temporary closure of local roads in the immediate construction area. Longer term impacts (also of greater magnitude) to these residences would result from the visual intrusion of new steel towers (or poles) and conductor wires within the existing corridor. These impacts are discussed in Section 4.12, Visual Quality. The rerouted McNary-Lower Monumental transmission line would follow a new route approximately 1.6 km (1 mile) through agricultural lands, over Highway 730, and into the McNary Substation. Lands temporarily disturbed during construction would be returned to pre-construction conditions. There would be no long-term impacts to land use along the route. Transmission lines would be a conditional or permitted use in all land use designations crossed.

Western 230-kV Alternative. During construction of this route, approximately 24 ha (97 acres) of land within the ROW would be temporarily disturbed. After the transmission line installation was complete, all lands except 0.01 ha (0.03 acre) would be returned to the original condition. As illustrated in Figure 3.7-1, the transmission line would pass through a number of land uses. The line would have little effect on land use along the route. Transmission lines would be allowed in all the land use and zoning designations the lines would pass through as permitted or conditional uses. The UECA 115-kV line relocation would temporarily disturb 15 ha (38 acres) within the ROW during construction of the line. Upon completion of construction, all lands except 0.004 ha (0.01 acres) would be returned to pre-construction conditions. There would be no permanent impacts on land use along the route.

Gas Lines

The 13.6-km (8.5-mile) long NWP connection would temporarily disturb 16 ha (39.6 acres) during construction. Disturbance would be temporary and land would be returned to pre-pipeline conditions following construction. The pipeline would pass through several land uses, although it would primarily be located in agricultural lands (Figure 3.7-1b). The pipeline would be a permitted or conditional use in all the land use designations crossed.

The 6.4-km (4-mile) long PGT gas connection would also temporarily disturb 7.94 ha (19.6 acres) of mostly agricultural lands during the construction, in addition to industrial. Disturbance would be minimal because land would be returned to pre-pipeline conditions following construction. The pipeline would pass through several land uses, although it would primarily be located in agricultural lands (Figure 3.7-1b). The pipeline would be a permitted or conditional use in all the land use designations it would cross.

Water Supply Line

The approximately 2-km (1.25-mile) long water supply pipeline would disturb approximately 4 ha (10 acres) of land. A road and railroad crossing would have no permanent effect on use of the road or railroad. The effect on land use would be minimal because all lands the pipeline would be constructed through would be returned to their original condition following construction. The pipeline would pass through agricultural, agribusiness, and industrial lands. The pipeline would be a permitted use in the land use designations it would pass through.

4.7.2 Consistency with Local Comprehensive Plans and Policies

The proposed project would be consistent with local comprehensive plans and policies. All project components would be classified as either permitted uses or conditional uses in both Umatilla County (which also regulates land use decisions in the cities of Hermiston, Umatilla, and Stanfield urban growth boundaries), and the city of Umatilla.

4.7.3 Mitigation

The following measures will be implemented to mitigate potential land use impacts from project construction and operation:

- Standard construction management practices to minimize impacts associated with construction such as dust, noise, and increased traffic will be developed to reduce potential nuisances to nearby land owners.
- Stockpiling and replacement of topsoil (reducing agricultural land impact).
- To mitigate temporary impacts from construction on agricultural lands, contact will be made with land owners to coordinate planting and construction schedules.

4.7.4 Unavoidable Adverse Impacts

Approximately 3 ha (5 acres) of prime farmland would be lost at the cogeneration facility site as a result of implementing the project in an area that is already in industrial use. The project is consistent with all local comprehensive plans and policies. Therefore, unavoidable adverse impacts to land use would be low.

4.7.5 Cumulative Impacts

The cogeneration facility would be similar in scale and use to adjacent industrial and agribusiness in the vicinity and would add to the industrial character of the surrounding area. The transmission line options for the most part would follow existing transmission line routes, and would add to the number of transmission lines passing through the project vicinity to the McNary Substation. The proposed project would contribute to the industrial character of the area, and cumulative impacts to land use are considered low.

4.8 Cultural Resources

4.8.1 Impacts

Direct impacts from the project would involve physical modification of cultural resources during construction activities such as site and road grading, excavation for foundations and utility lines, and heavy equipment off-road traffic.

The proposed project's natural gas and electrical transmission lines have the potential to directly affect canals that are elements of the Umatilla Project (Oetting 1993). Table 4.8-1 lists nine potential canal crossings by these project components, all of which are eligible for NRHP nomination.

4.8.2 Mitigation

The following measures will be implemented to mitigate potential impacts to cultural resources from construction of the proposed project:

- If the natural gas pipeline crossing of the Feedville Canal uses a cut-and-fill construction method, the canal walls will be restored to a condition as near to original as possible. This would be done, for example, by refilling the canal crossing with concrete that matches the existing concrete or earth canal wall in color.
- Construction of the transmission towers will avoid direct placement of poles within or on the immediate banks of the canals.
- Archaeologists will conduct shallow shovel and auger tests in the Umatilla River floodplain and terraces at the transmission line crossing to determine whether remains of the ethnographically known village of Miss-kha-low are located there. The testing will take place where new transmission towers will be located, once these are planned.
- The developer will carry out the following emergency procedures if construction personnel encounter previously unrecorded cultural resources during construction or operation of the project:
    - The developer will immediately notify the SHPO upon encountering an unrecorded cultural resource.
    - The developer will halt construction in the immediate vicinity of the find until the developer and SHPO can determine whether the cultural resource is potentially eligible for National Register nomination.
    - If the developer and the SHPO determine the cultural resource eligible for the NRHP, they will implement avoidance or data recovery procedures.
- The developer will supervise the preparation and distribution of a pamphlet explaining to project construction workers the procedures to follow in case they discover cultural resources during construction.

4.8.3 Unavoidable Adverse Impacts

The two natural gas line routes (PGT and NWP) would cross the Feedville Canal along Feedville Road. The extent of impact this would cause depends on the method of crossing. Tunnelling entirely under the canal would have a negligible effect. Cutting through the canal walls to bury the pipeline below the level of the canal bottom would cause a low level of impact. Crossing over the canal by attaching the pipeline to the Feedville Road bridge would also cause a low level visual effect.

Table 4.8-1. Umatilla Project Canals Crossed by Components

Project Components	**Canals Crossed**
Transmission Lines	
Eastern 500-kV Alternative	Z Canal; Hermiston Ditch; Maxwell Canal; A-Line Canal; Feedville Canal; Stanfield Branch of Furnish Ditch.
Western 230-kV Alternative	A-Line Canal
Gas Lines	
NWP Connector	Feedville Canal
PGT Connector	Feedville Canal

These impacts would be low. If construction were to cut through the canal walls, the walls would be refilled with concrete or dirt to appear as though there were no cut. Because the canal is a utilitarian feature, and because there is a large quantity of intact canal mileage belonging to the Umatilla Project in the project vicinity, the construction-related impacts of the project would not be significant. They would not damage the qualities of the canals that make them potentially eligible for NRHP nomination as elements of the Umatilla Project.

With the implementation of the mitigation measures listed in Section 4.8.2, the project would have no adverse effect on known historic properties. The State Historic Preservation Officer agrees with this conclusion (letter from Henry Kunowski, Project Manager, State Historic Preservation Office, Salem, Oregon to Dawn R. Boorse, Environmental Project Manager, Bonneville Power Administration, Portland, Oregon, May 10, 1995).

4.8.4 Cumulative Impacts

The project would not cause cumulative impacts to cultural resources.

4.9 Socioeconomics and Public Services

4.9.1 Workforce and Housing

Construction

The construction workforce would average approximately 150 workers over the 24-month construction period, with approximately 75 construction workers coming from outside the local area. The peak number of construction workers is estimated to be approximately 400, with approximately 200 of those coming from outside the local area.

Construction workforce projections for the proposed project could create a maximum demand for 200 housing units over part of the 24-month construction period. Average demand is estimated at 75 housing units. These estimates are based on a ratio of one worker to one housing unit (worst case). Time spent on the job site by individual construction workers would range from a few weeks to the full 2-year period. A majority of the housing need during peak construction would be met by rentals and transient-type housing such as RV spaces, motel/hotel rooms, mobile home spaces or mobile home rentals. Currently, there are sufficient transient-type housing units available in the project vicinity to meet this demand.

Some demand for permanent-type, single-family homes or mobile homes may be generated during construction. Available permanent housing in the project vicinity is currently limited; however, there are plans to construct additional housing units within 1 to 2 years (BPA 1994b). Depending on the timing of construction of the proposed project and construction of the new housing units, there could be a temporary shortage of permanent-type accommodations during the peak construction period, and average income levels in the project vicinity not being able to support new construction, the future supply may remain somewhat limited.

Operation

During operation of the proposed project, 24 permanent full time personnel are expected to be employed at the facility. In accessing the impact of the operation labor requirements on local housing, a worst-case scenario is assumed whereby all operations personnel would be non-local and relocate to the project area. A majority would most likely prefer permanent housing. Availability of permanent housing in the project vicinity is limited; therefore, permanent employees relocating into the project vicinity may have some difficulty finding suitable accommodations, and the increase in housing demand they and their dependents create may have a low to moderate adverse effect on the local housing market.

4.9.2 Employment and Income

The local economy in the project vicinity would benefit from the short and long-term employment increases and income. It is estimated that 50 percent, or 200 employees (worst-case), of the peak construction force of 400 would come from the local area. At present, based on the high unemployment rate of 9.5 percent (approximately 3,230 workers) in the project vicinity for 1992, there is a substantial number of workers available locally for employment. Many workers may also be recruited from the Pasco, Kennewick, and Richland, Washington area (Tri-Cities). Workers from this area would most likely keep their residences in the Tri-Cities and commute the project site 48.3 to 64.4 km (30 to 40 miles).

Using an employment multiplier of 1.2, approximately 90 indirect jobs would be created during the construction period, of which 56 are projected to be filled by local area residents. The local economy would also benefit from the project's permanent employment and resultant indirect employment. Estimates of the total employment during the operations period indicate 24 new direct jobs and 18 new indirect jobs, for a total of 42 new jobs; based on an applicable multiplier of 1.74.

The regional economy would also benefit from construction and operation of the proposed project. Such benefits would be the "ripple effects" from the purchasing of goods and services in the local economy during construction and operation of the facility, as well as the distribution of salaries to construction as well as permanent facility operation staff. The proposed project would have an annual payroll of approximately $900,000, equating to an average salary of approximately $38,000 for the 24 permanent employees. This is higher than the per capita personal income and median household income in the project vicinity. As wages and salaries are spent and re-spent throughout the local and state economy, potential benefits would be amplified. This cogeneration project has the added benefit of providing low-cost steam to the Simplot potato plant, which will help maintain a competitive position for the processing plant.

4.9.3 Fiscal Budgets

It is estimated that during its operational phase the project would generate approximately $100,000 in payroll-related taxes, and after 3 years of operation would begin contributing approximately $5 million annually in property taxes. This would result in a large increase in property tax revenue to schools with a negligible increase in school enrollment. Additionally, the state would experience a small (less than 1 percent) increase in business and occupation and brokered natural gas tax. During construction an increase tax revenue is expected from state payroll taxes levied against construction salaries and revenues. These increases would be temporary, therefore their impact, while positive, would be minimal.

4.9.4 Law Enforcement

The cogeneration facility site will be fenced and access controlled. The facility would operate 24 hours a day with personnel on site at all times. This would minimize opportunities for theft or vandalism. Police protection would be provided by the Oregon State Police and the Umatilla County Sheriff's Department. According to the Sheriff's Department, the facility is not expected to result in significant adverse effects to the department or its capability to provide adequate service to the area (pers. comm., T. Hamby, Secretary, Umatilla County Sheriff; ENSR Engineering and Consulting 1994a). In addition, second response calls for emergency services would be provided by the Hermiston Police Department through a mutual aid agreement with the Sheriff's Department. The Hermiston Police Department anticipates no problems with providing police services to the site (pers. comm., G. Asher, Chief, Hermiston Police Department, December 7, 1993; ENSR Engineering and Consulting 1994a). An increase in demand for police services as a result of new residents moving to the area due to the proposed facility is not anticipated. Any increase could be handled by the present police force.

4.9.5 Fire Protection

The cogeneration facility and associated elements will be constructed with fire hydrants and a sprinkler and deluge system. Company employees will be trained in emergency first aid procedures. According to the Hermiston Fire Department, if the facility is constructed with all fire protection equipment and facilities in accordance with the Oregon Fire Code, it will not be expected to result in significant adverse impacts to the department's existing capabilities (pers. comm., J. Stearns, Chief, Hermiston Fire Department, December 1, 1993; ENSR Engineering and Consulting 1994a).

There will be some permanent employees hired from outside the area who will relocate to the project vicinity. However, this number is not expected to increase demand for fire protection services; therefore, it would not adversely impact local fire protection services.

4.9.6 Medical Services

The project is not expected to adversely affect medical services in the project vicinity. Good Shepherd Community Hospital in Hermiston has ample capability to handle any emergency situation associated with the project (pers. comm., K. Loveland, Public Relations Director, Good Shepherd Community Hospital, December 7, 1993; ENSR Engineering and Consulting 1994a).

4.9.7 Transportation

Construction Traffic

Assuming a construction worker vehicle occupancy rate of 1.0 employee per vehicle (worst-case), 400 employee vehicles would be accessing and departing the cogeneration facility site during peak construction. In addition, an estimated 20 trucks per day would deliver supplies to and haul waste from the site for the facility as well as the connecting powerlines and pipelines. The portion of the truck traffic projection representing heavy haul loads is unknown at this time; however, the need for heavy haul loads may be reduced through the use of the adjacent railroad siding. Traffic impacts resulting from construction of any pipeline beyond the immediate vicinity of the project site would be dispersed and therefore be minimal.

Construction access for the cogeneration facility would be via SR 207 and the existing channelized intersection with J.R. Simplot's entrance road. Construction traffic would increase volume on SR 207. The existing channelized intersection has long site distances, and would facilitate the additional left-turning movements for southbound to eastbound vehicles. Construction traffic along this section of SR 207 would represent approximately a 15 percent increase in ADT over the 1991 ADT (2,650 to 3,350 daily trips) recorded for this same segment of highway (ODOT 1991).

Operations Traffic

Assuming a vehicle occupancy rate of 1.0 employee per vehicle (worst-case), the 24 employee vehicles accessing and departing the site each day would represent a negligible increase over the 800 daily employee trips and 50 to 60 truck trips currently occurring in connection with the J.R. Simplot plant and the approximately 2,650 to 3,350 trips occurring daily along this section of SR 207, discussed above.

4.9.8 Mitigation

The following measures would be implemented to mitigate adverse impacts to socioeconomics and public services:

- The developer proposes to establish a housing clearinghouse at the project site for construction workers. This clearinghouse will coordinate with local officials and housing owners to place workers needing lodging, if necessary.
- All deliveries of heavy equipment will be scheduled to avoid times of road weight restrictions.
- Delivery of heavy material to the site can, if necessary, be made by rail.
- Construction worker traffic patterns to the site, both egress and ingress, will be coordinated with the state, county, and J.R. Simplot.
- The sight distances could be improved and a left turn lane constructed on the County road.

4.9.9 Unavoidable Adverse Impacts

Because of the limited availability of permanent housing, the project could have a low unavoidable adverse impact on the socioeconomic environment of the project vicinity. However, construction and operation of the project would also have beneficial impacts on the economy.

4.9.10 Cumulative Impacts

The project could result in a small, incremental increase in population in the project vicinity as a result of the in-migration of skilled workers. Umatilla County has experienced a moderate 3.5-percent growth rate over the past 10 years and population growth is expected to continue at a moderate rate. Population increases resulting from construction or operation of this project alone would not significantly affect the projected growth rate for Umatilla County and would not contribute to significant cumulative socioeconomic impacts in the project vicinity. Therefore, cumulative impacts from the project are considered low.

4.10 Recreation Resources

4.10.1 Effect on Recreation

There would be no direct impacts to any existing or planned recreational facilities or opportunities from construction and operation of the proposed project.

The proposed project is located in an existing industrial area with plans for expanded industrial uses. The project vicinity, therefore, has little potential for future development of recreational opportunities or facilities.

4.10.2 Mitigation

No adverse impacts to recreational facilities and opportunities from construction and operation of the proposed project are expected; therefore, no mitigation measures are necessary.

4.10.3 Unavoidable Adverse Impacts

No adverse effects on recreation facilities and opportunities have been identified.

4.10.4 Cumulative Impacts

Because no adverse impacts on recreation facilities, or opportunities from the proposed project were identified, cumulative impacts on recreation resources would be negligible.

4.11 Public Health and Safety

4.11.1 Cogeneration Facility

Regulated Fuel Substances

The cogeneration facility would burn natural gas as the primary fuel supply. A back-up supply of No. 2 fuel oil would be stored in two aboveground tanks each with a capacity of 3,785,400 l (1 million gallons). The tank would be surrounded by a concrete dike of sufficient size to contain the total volume of one tank, including the precipitation from the greatest storm event for the area as required by regulations. Fuel oil would be delivered to the facility via railroad tanker car using the existing Simplot siding to replenish the storage tanks during the relatively short duration of fuel oil firing. A 757 l (200 gallon) tank used to hold diesel fuel for the fire protection system would be on site and similarly protected. Direct impacts from use and storage of these regulated fuel substances could occur in the unlikely event of an accidental release of the products, which could increase the exposure of the fuel substances to the facility personnel. However, with adequate ventilation and prescribed emergency safety measures, the impact is expected to be low.

During construction of the cogeneration facility, the risk of a significant<1> fire or explosion is extremely low. Most of the building materials used in the construction of a cogeneration facility are nonflammable. Many of the major components (e.g., turbines and boilers) for a cogeneration facility are constructed off site. During the construction process, small quantities of flammable liquids and compressed gases would be used and stored on site and at the contractors laydown area. Flammable liquids may include fuels, paints, and cleaning solvents, compressed gases may include acetylene, oxygen, helium, hydrogen, and argon for welding. The storage and handling of these materials are regulated through the Oregon Occupational Safety and Health regulations for hazardous material (OAR, Division 2 General Occupational Safety and Health Rules, Subdivision H, Hazardous Materials: 1910.101--1910.120).

Operation of a cogeneration facility may have three primary materials that under certain conditions have the potential for explosion. These are natural gas, anhydrous ammonia, and hydrogen. Natural gas, which will be piped to the site, is the primary fuel for operating the turbines. None of the natural gas will be stored on site. Hydrogen (70,000 cubic feet storage capacity) will be used by the facility for cooling electrical generators. Ammonia, either anhydrous or aqueous, is used in air pollutant control equipment.

Natural gas and hydrogen are used for industrial purposes throughout the United States with a very low record of explosion as a result of its use. When explosions have occurred they have been the result of equipment failure or human error that released flammable gases into unsafe conditions. The combination of flammable gases, an ignition source, and oxygen may result in an explosion. To prevent or minimize the potential for an explosion the Uniform Fire Code (UFC) as well as Occupational Safety and Health Administration (OSHA) regulations have been developed to ensure the safe operation, handling, and management of these and other potentially explosive materials.

Table 4.11-1. Chemicals Likely to be Stored at the Cogeneration Facility

Item No.	Storage Method	Contents	Estimated Liters (gallons)
1	No. 2 Fuel Oil Storage Tank No. 1	Fuel Oil	3,785,400 (1,000,000)

2	No. 2 Fuel Oil Storage Tank No. 2	Fuel Oil	3,785,400 (1,000,000)
3	Fuel Tank	Diesel	757 (200)
4	Aqueous Ammonia Storage Tank	Ammonia	9,500 (35,961)
5	Shot Chemical Feed Tank (Closed Cooling Corrosion Inhibitor)	*	100 (378)
6	Shot Chemical Feed Tank (Closed Cooling Corrosion Inhibitor)	*	100 (378)
7	Phosphate Tank	NA_3PO_4	100 (378)
8	Phosphate Tank	NA_3PO_4	100 (378)
9	Oxygen Scavenger Tank	DEAE	100 (378)
10	Oxygen Scavenger Tank	DEAE	100 (378)
11	Neutralizing Amine Tank	Morpholine	100 (378)
12	Neutralizing Amine Tank	Morpholine	100 (378)
13	Bulk Phosphate Storage Tank	NA_3PO_4	2,000 (7,570)
14	Bulk Oxygen Scavenger Tank	DEAE	2,000 (7,570)
15	Bulk Neutralizing Amine Tank	Morpholine	2,000 (7,570)
16	Inhibitor Tank	Polyphosphate	500 (1,892)
17	Biocide Tank	NaOCl	8,000 (30,283)
18	Acid Tank	Sulfuric Acid	8,000 (30,283)
19	Inhibitor Tank	Polyphosphate	500 (1,892)
20	Biocide Tank	NaOCl	8,000 (30,283)
21	Acid Tank	Sulfuric Acid	8,000 (30,283)
22	Acid Batch Tank	Sulfuric Acid	500 (1,892)
23	Acid Storage Tank	Sulfuric Acid	7,000 (26,497)
24	Caustic Batch Tank	NaOH	500 (1,892)
25	Caustic Storage Tank	NaOH	7,000 (26,497)
26	Fuel Tank Fire Pump Pkg.	No. 1 Diesel	550 (2,081)
27	Acid Day Tank	Sulfuric Acid	500 (1,892)
28	Anti Scalant Day Tank	Sodium Tolyltriazole	500 (1,892)

29	Acid Day Tank	Sulfuric Acid	500 (1,892)
30	Anti Scalant Day Tank	Sodium Tolyltriazole	500 (1,892)
31	Lube Oil Tank, Comb. Turbine	Lube Oil	5,600 (21,198)
32	Lube Oil Tank, Comb. Turbine	Lube Oil	5,600 (21,198)
33	Lube Oil Tank, Steam Turbine	Lube Oil	TBD
34	Lube Oil Tank, Steam Turbine	Lube Oil	TBD
35	Stm. Turbine Control Fluid	Fryquel EHC	TBD
36	Stm. Turbine Control Fluid	Fryquel EHC	TBD
37	Liquid Alum. Storage Tank	$Al_3(SO_4)^3$	7,000 (26,497)

TBD = To be determined.
*** Sodium metasilicate, sodium hydroxide, sodium nitrate, sodium tetraborate.**

To ensure proper safe handling of the natural gas, the entire system would be installed and operated in accordance with the National Fire Protection Association (NFPA) 54: Natural Fuel Gas Code, Part 2; Gas Piping System Design, Materials and Components, Part 3; Gas Pipe Installation, Part 4; and Inspection, Testing and Purging. The piping would be designed in accordance with ANSI B31.8 and Title 49 CFR, Part 192 and with OAR 345-24-060.

Fuel control systems on the gas turbines would include automatic fuel shut-off valves to stop all fuel flow to the unit under shut-down conditions. Fuel flow would restart when all safety permissive firing conditions have been satisfied. Each fuel shut-off valve would have a mechanical device for local manual tripping and a means for remote tripping. A vent valve would be provided on fuel gas system to automatically vent the piping downstream of the shut-off valve when the fuel shut-off valve closes. Gas shut off valves would be installed at the NWP and PGT pipeline connection points as well as at the cogeneration plant. The area immediately around the gas system would be a NFPA/NEC Class I, Division II, Group D Hazardous area. Operations in this area would be in accordance with this classification and accepted, proven industrial standards of practice and procedures.

A back-up fuel supply of No. 2 fuel stored in two 3.8 million liter (1 million gallon) on-site fuel tanks is a future planned option for the Hermiston Power Project.

Fuel oil storage tanks would be designed in accordance with NFPA requirements. The tanks would be located within a concrete curbed area to provide secondary containment. Leakage monitoring would also be provided. The tank farm area would be provided with a foam fire protection system.

Regulated Non-Fuel Substances

The cogeneration facility may use and store the chemicals listed in Table 4.11-1. Indirect impacts from non-fuel substances such as adverse health effects could result if release were uncontrolled and of sufficient volume to affect off-site populations.

Secondary containment would accommodate the non-fuel substances in the unlikely event of an accidental release. The indirect impacts from such a release would be minimal due to the secondary containment and minimal amounts of non-fuel substances stored at the facility.

Management of hazardous substances would be conducted in accordance with applicable federal, state and local regulatory standards for public and occupational safety and health protection. The storage and conveyance system for liquid hazardous chemicals would be designed to prevent and contain spills through pumping and storage controls and secondary containment around tanks.

Pumping systems and storage tank controls would include:

- Dry disconnects at transfer hose and piping connections
- Automatic pump shut-offs on tank high level
- Redundant tank level indicators and high level alarms
- Daily visual inspections of tank levels
- Written unloading and transfer operation instructions

Measures to protect equipment and workers from harmful exposure to chemicals such as sulfuric acid and caustic would be implemented. Areas in which these chemicals would be stored or used would have safety showers, eyewashes, and containment areas so that spills and wastes would be collected, treated and disposed of in accordance with regulatory requirements. Flange covers would be used in all acid and caustic piping. Foundations and slabs for equipment containing lubricating oil, insulating oil, or hydraulic fluid would be designed to contain and collect any leakage or spill. Neutralizers and/or absorbers would be stored on-site in case a spill does occur. Protective garments and face coverings would be required to be work by personnel handling sulfuric acid and caustic. Chemical storage areas would provide a secondary containment storage volume equal to 100 percent of the maximum chemical volume in primary containment.

The facility would meet or exceed the following safety and health requirements:

- Storage and handling of flammable and combustible liquid chemicals would be in compliance with NFPA 30 and 321 ("Basic Classification of Flammable and Combustible Liquids").
- All chemical and flammable fluid storage areas would be identified as either hazardous or non-hazardous as required by applicable regulatory designations or industry-recommended practices.
- Chemical storage areas would be secondary containment to confine any chemical spillage.
- Personnel involved with the chemical fluids and flammable gasses would be trained in proper handling procedures for both normal and emergency situations, and safety precautions in the use of these fluids.
- All piping systems would be designed in accordance with the American Society of Mechanical Engineers (ASME B31.1, 31.4, or 31.8 piping codes as required by its service).
- Standards for the design, construction, installation, venting, diking, piping, valving, supports, foundations, and anchorage of tanks would be in accordance with State of Oregon Requirements.

A Spill Prevention Containment and Countermeasures Plan (SPCC) would be prepared for the project. The plan would be developed in accordance with local, state and federal requirements and would be submitted to the appropriate agencies for review and approval.

Chemicals used in the operation of the plant would be procured from commercial sources. These vendors would provide, or would contract, for transportation of these chemicals from the supplier's facility to the plant. The vendor or contracted carriers are licensed and regulated by state agencies, and are liable for the safe and proper handling and transport of these materials. Their responsibilities end with the delivery and off-load of these chemicals at the plant site into properly permitted on-site facilities.

All chemicals would be delivered in closed bulk containers and stored in the turbine generator building or stored outdoors with secondary containment dikes.

Sulfuric acid tanks would be supported on saddles and surrounded by a secondary containment dikes. The containment area would be sized to contain 100 percent of the maximum chemical capacity of the tank, plus the 50-year, 24-hour storm event. The containment area would be equipped with either a gravity drain with a normally closed drain valve or a transfer pump and piping to allow uncontaminated rainwater to be removed. The area enclosed by the dike would be partially filled with coarse limestone to passively neutralize any potential leakage from the tanks.

Boiler feedwater treatment chemicals would be stored in bulk storage tanks. Tanks would be provided for phosphate/polymers, oxygen scavengers, and neutralizing amines.

Sodium hypochlorite for chlorination and biological control would be required in the raw water pretreatment system. Purchased sodium hypochlorite solution would be stored in a bulk tank and pumped via metering pumps.

Chemicals used in raw water filtration and cooling tower biocides would be stored in totes. Bulk storage tanks would be provided for corrosion inhibitors and, as noted above, for sulfuric acid.

The totes would provide considerable protection to the leak-proof plastic liners encasing each solution, permitting a solution to be stored in normal warehouse spaces. Injection pumps would take solution directly from these containers, so that personnel would not be exposed to the solution.

Curbs would be installed at all chemical treatment areas; the spill containment system would be designed to hold 100 percent of the maximum chemical capacity of the tank, plus the 50-year, 24-hour storm event. Any liquids captured by the containment system would be pumped out and either added to the cooling water system, or if contaminated, disposed of as required by regulations. All transport piping would be constructed of corrosion resistant material to prevent corrosion or deterioration by the liquid being carried.

A number of miscellaneous chemicals and equipment lubricants, in addition to spare parts and equipment, would also be stored within turbine/generator building.

Compressed gases used at the facility would be stored outdoors in returnable cylinders. The gas cylinders would be stored in vertical racks with individual bottle restraints. Less than ten cylinders of each type of gas required for operation of the plant would be stored on site. The compressed gases stored on site would include nitrogen, carbon dioxide, oxygen, and acetylene. These gases would be stored outside to minimize the safety hazards associated with accidental releases.

In order to reduce the potential risk to public health aqueous ammonia, instead of anhydrous, would be used in the air pollution control system to reduce plant emissions of nitric oxides (NO_x). Aqueous ammonia remains a liquid when spilled/released; it can be contained and removed by normal spill prevention and response procedures, and does not release significant amounts of gaseous ammonia into the atmosphere, compared to the anhydrous form.

Table 4.11-2. Typical Solid Waste Materials Generated by a Cogeneration Facility

Waste Stream	Classification	Amount	Frequency	On-Site Treatment	Storage	Off-Site Treatment/Disposal
Used Lead Acid Batteries	Hazardous	2-cells	Once Per Year	None	90-days	Recycle to Battery Vendors
Spent SCR Catalyst Material	Hazardous	170-230 cu. m (6,000-8,000 cu. ft)	Once Every 3-5 Years	None	None	Ship to Hazardous Waste Disposal Facility
Oil Rags, Oil Absorbent Material	Hazardous	<1 cu. m (20 cu. ft)	Once Per Month	None	90-days	Ship to Hazardous Waste Disposal Facility
Spent Cation	Nonhazardous	48 cu. m	Once	None	None	Recycle to Resin

Demineralizer Resins		(1,700 cu. ft)	Every 8-10 Years			Vendors
Spent Anion Demineralizer Resins	Nonhazardous	45 cu. m (1,600 cu. ft)	Once Every 4-5 Years	None	None	Recycle to Resin Vendors
Office Waste Materials (Trash and Garbage)	Nonhazardous	>9 kg/day (>20 lb./day)	Daily	None	None	Ship to Sanitary Landfill

A aqueous ammonia storage tank would be located near one of the heat recovery steam generators. The tank would be located in a fully contained and diked concrete storage area. The holding capacity of the containment area would be 100 percent of the maximum tank capacity, plus the 50-year, 24-hour storm event. The diked area would have a normally closed drain valve. Any liquids collected in the containment area would be transferred to the cooling water system, or if contaminated, disposed of as required by regulations.

Vapors from the tank vent would be bubbled through a water seal to absorb the vapors and prevent the release of ammonia to the atmosphere. Water from the seal would be neutralized in the demineralizer neutralization tank.

In the unlikely event of a significant release of ammonia solution from the tank, spilled liquid would be retained within the concrete containment area. A Spill Prevention Control and Countermeasure (SPCC) plan would be in place prior to the delivery of ammonia. Included in the plan would be procedures for prompt reporting to ODEQ (within 24 hours) of any spill greater than 378.5 liters (100 gallons), in accordance with Oregon regulations implementing Title III of the Superfund Act and Reauthorization Amendments (SARA). Also included would be a list of measures to mitigate such a release.

Solid Waste

Typical solid waste materials expected to be created by the cogeneration facility are listed in Table 4.11-2. The total annual volume of solid waste generated is estimated to be less than 191 cubic m (250 cubic yards) or 25.4 metric tons (25 tons).

The water supply and wastewater treatment processes would create sludges requiring disposal in a suitable facility. These sludges would be tested for potential hazardous characteristics and disposed of in an appropriately certified facility.

4.11.2 Gas, Water Supply and Waste Water Pipelines, and Electrical Transmission Lines

Hazardous substances used during the construction of the buried pipelines and overhead transmission lines include petroleum products, lubricants, and other substances associated with vehicle operation and maintenance. During construction, adverse environmental effects could be caused from the accidental release of controlled substances. Adverse environmental impacts include possible impacts to vegetation and/or wildlife due to exposure to controlled substances.

The 6.4 km (4 mile) PGT and 13.7 km (8.5 mile) NWP natural gas supply pipeline interconnections and all pipeline facilities within the power plant itself would be designed, constructed, operated, and maintained in accordance with the Department of Transportation's (DOT) Subchapter D, "Pipeline Safety," as prescribed in Title 49 CFR Parts 190 and 192. DOT's 49 CFR governs the design, construction, and operation of gas transmission lines. Its purpose is to ensure adequate protection of the public from natural gas pipeline accidents. Part 190, "Pipeline Safety Program Procedures," dictates the procedures used by the Office of Pipeline Safety regarding pipeline safety under the Natural Gas Pipeline Safety Act.

In addition, the standards incorporate by reference all of the applicable standards documents published by the American National Standards Institute (ANSI), American Petroleum Institute (API), the American Society of Mechanical Engineers (ASME), American Society for Testing Materials (ASTM), Manufacturers Standardization Society (MSS), the National Fire Protection Association (NFPA) and other recognized national standards in each of the pertinent engineering and technical disciplines. The standards also provide guidelines for land use considerations and to provide adequate safeguards against encroachments, thereby increasing long-term public safety and protection of the pipeline integrity. All of these standards are in compliance with State and local ordinances and are periodically reviewed and updated to incorporate newly adopted revisions.

40 CFR Part 192, "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards," the most detailed of the regulatory sections, has several provisions. It prescribes minimum safety requirements for pipeline facilities and gas transportation, including material selection, minimum design requirements, and protection required from internal, external, and atmospheric corrosion.

Part 192 also defines class locations for pipeline routes. The "class location unit" is the area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipe. These classes determine pipeline design and safety measures, such as thickness of the pipe wall, design pressure, valve spacing, and depth of cover. Area classifications are based on population density in the vicinity of the pipeline, with more densely populated areas requiring more rigorous safety measures.

- Class 1 - Locations with 10 or fewer buildings intended for human occupancy.
- Class 2 - Locations with more than 10 but fewer than 46 buildings intended for human occupancy.
- Class 3 - Locations with 46 or more buildings intended for human occupancy, or where the pipeline lies within 100 yards of any building or small, well-defined outside area occupied by 20 or more people during normal use.
- Class 4 - Locations where buildings with four or more stories aboveground are prevalent.

Higher class locations require greater safety considerations in pipeline design, testing, and operation. Pipelines buried in Class 1 locations must be installed with a minimum cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require 36 inches of cover in normal soil and 24 inches in consolidated rock.

40 CFR Part 192 specifies welding practices, including procedures, qualifications of welders, inspection, and testing. Nondestructive testing of welds is required for at least 10 percent of welds in Class 1; at least 15 percent in Class 2; and 100 percent in Class 3 and 4, and at crossings of major or navigable rivers, within railroad or public highway rights-of-way, including tunnels, bridges, and overhead road crossings. If 100 percent is impracticable, then at least 90 percent of welds in these locations must be tested. At pipeline tie-ins, 100 percent of welds must be tested. Part 192 prescribes minimum requirements for the protection of pipelines from external, internal, and atmospheric corrosion. The project pipelines are required to have an approved external protective coating and to be equipped with a cathodic protection system that must be tested at least once a year.

Each pipeline must be electrically isolated from other underground metallic structures, unless the pipeline and the other structures are electrically connected and cathodically protected as a single unit. Where a pipeline is located close to electrical transmission tower footings, or in other areas where fault currents or unusual risk of lightning may be anticipated, the pipeline must be provided with protection against damage due to fault currents or lightning, and protective measures must also be taken at insulating devices.

Part 192 also prescribes minimum leak-test and strength-test requirements for pipelines. Test pressure is determined according to class location and the proposed maximum allowable operating pressure (MAOP) as follows:

Class	Test Pressure
1	1.1 x MAOP (except 1.25 x MAOP if pipeline is within 300 feet of building)

2	1.25 x MAOP
3 and 4	1.5 x MAOP

Water must be used as a test medium in all Class 3 and 4 locations; water, air, or gas may be used, depending on specific circumstances, in Class 1 and 2 locations.

Class locations also determine the maximum distance allowed between sectionalizing block valves as follows: Class 1 - 20 miles, Class 2 - 7.5 miles, Class 3 - 4 miles, Class 4 - 2.5 miles.

In addition to the specifications described above, a number of other safety design features would be built into the pipeline engineering. For instance, the pipeline would be buried deep enough so that tillage activities in agricultural areas would not pose a threat to pipeline integrity. Thicker wall pipe would be used at road, railroad, and canal crossings.

Each pipeline operator is required to have a patrol program to observe surface conditions on and adjacent to the pipeline right-of-way for indications of leaks, construction activity, and other factors that might affect safety and operation. The maximum allowable frequency between patrols is as follows:

Class	At Highway and Railroad Crossings	At All Other Places
1 and 2	7.5 months but at least twice each calendar year	15 months but at least once each calendar year
3	4.5 months but at least four times each calendar year	7.5 months but at least two times each calendar year
4	4.5 months but at least four times each calendar year	4.5 months but at least two times each calendar year

Part 192 prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Under section 192.615, Part 192, "Emergency Plans," each pipeline operator must also establish an emergency plan that provides written procedures to minimize the hazards from a gas pipeline emergency. Key elements of the emergency plan include procedures for:

- Receiving, identifying, and classifying emergency events, such as gas leaks, fires, explosions, and natural disasters
- Establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response
- Making personnel, equipment, tools, and materials available at the scene of an emergency
- Protecting people and property from actual or potential hazards
- Providing for the emergency shutdown of the system and its safe return to service.

Each pipeline operator must also maintain a liaison with fire, police, and public officials; know the resources and responsibilities of each organization that may respond to a gas pipeline emergency; and coordinate mutual assistance in responding to emergencies. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials.

4.11.3 Electrical and Magnetic Fields (EMF) and Shock Hazard

EMF

Both electric and magnetic alternating-current (a-c) fields induce currents in conducting objects, including people and animals. These currents, even from the largest power lines, are too weak to be felt. However, some scientists believe that these currents might be potentially harmful and that long-term exposure should be minimized. Hundreds of studies on EMF have been conducted in the United States and other countries. Studies of laboratory animals generally show that these fields have no obvious harmful effects. However, a number of subtle effects of unknown biological significance have been reported in some laboratory studies (Frey 1993).

Currently, much attention is focused on several recent reports suggesting that workers in certain electrical occupations and people living close to power lines have an increased risk of leukemia and other cancers (Sagan 1991, National Radiological Protection Board [NRPB] 1992, Oak Ridge Associated Universities [ORAU] Panel 1992, Stone 1992). Most scientific reviews, however, find that the overall evidence is too weak to establish a cause-and-effect relationship between EMF and cancer. A review of some of the studies relating to EMF and possible biological and health effects are included in Appendix B.

A magnetic field exposure assessment was done for the proposed project using industry-accepted computer modeling techniques by first estimating what future magnetic levels would be without the proposed project. This analysis served as a baseline measurement for engineers to estimate the possible change in field levels assuming the proposed project is in place. An increase in public exposure is defined as a situation where field levels with the new project will increase and buildings exist nearby.

Today, most of the scientific concern focuses on exposure to magnetic fields. Additionally, people are not shielded from magnetic fields by trees, houses, and other objects as with electrical fields. Therefore, BPA exposure assessments focus on magnetic field levels.

Western 230-kV Alternative

UECA's Relocated 115-kV Transmission Line. In those areas of the proposed route where there are no existing transmission lines, buildings near the transmission corridor may be exposed to electric and magnetic fields from the proposed project. Figure 4.11-1 shows the magnetic field profile for this portion of the line.

Between Westland and McNary Substations. The transmission corridor currently contains an existing U.S. Generating/UECA double circuit transmission line. The proposed project will not be changed physically, but will be changed in the way it is operated electrically. As a result of changes in electrical phasing, the magnetic fields are expected to be less with the energization of the proposed alternative. Figure 4.11-2 shows the magnetic field profile for this portion of the line.

Between Westland and Hermiston Power Project Substations--Comparison between Single and Double Circuit Lines. There is very little difference between the single and double circuit alternatives at the edge of the ROW and beyond. However, there is no existing line, thus buildings near the transmission corridor may be exposed to electrical and magnetic fields from the proposed project. Figure 4.11-3 shows the magnetic field profile for this portion of the line.

Eastern 500-kV Alternative

Between Hermiston Power Project and McNary Substation. There is no existing transmission line. Thus buildings near the transmission corridor may be exposed to electrical and magnetic fields from the proposed project. Figure 4.11-4 shows the magnetic field profile for this portion of the line.

Adjacent to BPA's McNary-Roundup 230-kV Line. Buildings on the east side of the corridor may experience an increase in exposure to magnetic fields. The west side of the corridor contains an existing transmission line, thus there will be little difference in magnetic field exposure from the proposed project as compared to existing exposure for buildings near the transmission corridor. Figure 4.11-5 shows the magnetic field profile for this portion of the line.

Both the 230-kV Alternative and 500-kV Alternative will meet all state of Oregon standards for noise and electrical field standards.

Electrical Shock

Power lines, like electrical wiring, can cause serious electric shocks if certain precautions are not taken. These precautions include building the lines to minimize the shock hazard. All BPA lines are designed and constructed in accordance with the National Electrical Safety Code (NESC). NESC specifies the minimum allowable distances between the lines and the ground or other objects. These requirements basically determine the edge of the ROW and the height of the line (i.e., the closest point that houses, other buildings, and vehicles are allowed to the line) to limit electric field effects to acceptable levels.

People must also take certain precautions when working or playing near power lines. It is extremely important that a person not bring anything, such as a TV antenna or irrigation pipe, too close to the lines. BPA provides a free booklet that describes safety precautions for people who live or work near transmission lines (Living and Working Around High Voltage Power Lines).

Transmission lines can also induce voltages into objects near the lines. This effect can lead to nuisance shocks if a voltage is induced on something like wire fencing which is on wood posts and, therefore, insulated from ground. Usually, however, this becomes a problem only with lines of voltages above 230 kV. Should problems develop with either high- or low-voltage lines, they can be corrected by simple grounding techniques. For 500-kV lines, grounding of certain objects near the lines is a routine part of the construction process.

4.11.4 Mitigation

The following measures will be implemented to mitigate potential impacts to public health and safety from construction and operation of the proposed project.

- A final Spill Prevention, Control, and Containment (SPCC) Plan will be developed and in place prior to the arrival and storage of any chemicals to the proposed facility. The plan will meet all the requirements of 40 Code of Federal Regulations (CFR) Part 112.
- The storage and use of substances at the site will conform to the Federal UFC Article 80. In compliance with this regulation, a Hazardous Materials Inventory Statement and a Hazardous Materials Management Plan will be produced and filed with the Public Utilities Building Department prior to the arrival of any hazardous materials. These plans will include all the information as listed in the UFC Appendix II-E. In addition, the facility will adhere to the reporting requirements under Superfund Amendment and Reauthorization Act (SARA) Title III.
- A reuse and recycling plan will help reduce impact from solid waste generated by the project.
- A National Pollutant Discharge Elimination System (NPDES) Permit will be applied for prior to construction of the gas pipelines to address handling of storm water.
- A Storm Water Pollution Prevention Plan will be developed for the construction of the electrical transmission access roads, if needed.

4.11.5 Unavoidable Adverse Impacts

Steps and measures have been taken to ensure that the construction and operation of the proposed project would not have significant adverse effects on the health and safety of the public. Therefore, adverse impacts to public health and safety from the proposed project are considered low.

4.11.6 Cumulative Impacts

Operation of the project would increase the amount of solid waste generated in the region. In regard to hazardous materials, the potential for exposure to regulated fuel and regulated non-fuel substances would increase. However, all necessary control measures will be taken to minimize the likelihood of an accidental release. Therefore, cumulative impacts would be low.

4.12 Visual Quality

4.12.1 General Effects of Project Components

Cogeneration Facility Site

The cogeneration facility would be most visible at distances of up to about 3.2 km (2 miles) from the site. At distances greater than 3.2 km (2 miles), the facility would appear in the background and would blend with other similar features in the area. Therefore, beyond the 3.2-km (2-mile) range, the cogeneration facility would not constitute an intrusion into the viewshed.

The most visually dominant feature of the cogeneration facility would be the two 59.4-m (195-foot)-high emission stacks that would be visible from portions of the roadways in the vicinity and from nearby residences. In views from I-84 and SR 207, the stacks would be visible within the panoramic views of the vicinity. Other vertical elements such as water towers and grain elevators are also visible in this area. The stacks would be viewed as part of a group of industrial structures visible from the roadways. The proposed project would increase the industrial appearance of the area's overall visual character but would result in low adverse impacts on views from the roadways in the area.

Nearby residences located primarily south of the facility along Umatilla Meadows Road would have views of the cogeneration facility. Most of the views would be limited to the upper portions of buildings and the stack. These houses currently have similar views of the existing J.R. Simplot plant and other facilities in the area.

During cold temperatures, cooling tower emissions would also form steam plumes that would be visible for several miles. As steam plumes are already being generated by J.R. Simplot, Lamb-Weston, and other industrial users in the general Hermiston area, the effect of these additional plumes would not be significant.

The cogeneration facility would not be visible from the sensitive viewing areas described in the Umatilla County Comprehensive Plan, including Lake Umatilla, Lake Wallula, Hat Rock State Park, Cold Springs Reservoir, Wallula Gap, and McKay Reservoir. The cogeneration facility would be visible from some portions of the Umatilla County Scenic-Historic Road, specifically to travellers along Feedville Road.

Because of intervening terrain and distance, the facility, with the possible exception of the upper portion of the two emission stacks, would not be visible from the city of Hermiston, where most of the recreational facilities and opportunities described above are located.

Portions of the project would be visible from the Umatilla River. However, because the proposed project would be located in an existing industrial area, it would not present significant additional visual intrusion at this location.

<u>Water and Gas Pipelines</u>

The only visual impacts associated with the water and gas pipelines would occur during construction activities. Construction activities (primarily dust) would be visible along some sections of the lines, but would be temporary. The lands the pipelines would be routed through would be revegetated or returned to their original conditions upon completion of construction activities.

<u>Transmission Lines</u>

The majority of either transmission line alternative follow existing transmission line ROWs and would have minor negative visual impacts on the adjacent landscape. Generally, new transmission lines would be built adjacent to an existing powerline within the existing ROW. Some of the proposed transmission line route options would require replacing existing utility poles with larger, taller poles or adding new poles that may be more dominant in the viewshed. However, it also means in most cases that poles would be farther apart.

Eastern 500-kV Alternative. The section of the Eastern 500-kV Alternative between the cogeneration facility and the BPA McNary-Roundup Corridor would be new and would consist of 38.7 m (127 feet) high steel poles (or towers), running eastward along the south side of Feedville Road and then north along Canal Road. Viewers traveling along the 7-km (3-mile) Feedville Road section of the Umatilla County Scenic-Historic Road would observe the Eastern 500-kV transmission line. The negative visual impacts associated with the section of transmission line located adjacent to the Scenic-Historic Road would be not significant, because of the visibility of other transmission lines in the immediate area. The rest of the route would run within the existing BPA McNary-Roundup Corridor.

The presence of the new (proposed) transmission line, although within the existing McNary-Roundup Corridor containing transmission lines, would create a noticeable visual impact to travelers along the local roads intersecting with the corridor; and especially to the 115 residences within 152 m (500 feet) of the corridor. Although local residences and travelers are somewhat accustomed to viewing existing overhead transmission poles and lines, the new steel poles (or towers) would be noticeably higher than the existing wooden "H-Type structures." However, local travelers along the intersecting road would encounter the new transmission line for only brief periods as they approached and passed under the corridor. The residences adjacent to the corridor, on the other hand, would be subjected to a long term and more constant visual impact from the new line.

The rerouted McNary-Lower Monumental line would be located along a new route approximately 200 m (656 feet east of its present location and would cross over Highway 395. Because the number of transmission lines near the new route that converge on the McNary Substation, the addition of the rerouted McNary-Lower Monumental line would not have a significant impact on the visual quality of the area near the new route.

Western 230-kV Alternative. Most of the Western 230-kV line would utilize the existing UECA 115-kV/HGP 230-kV transmission line corridor from the Westland Substation to the McNary Substation. Along this section of the route, this alternative would cause no significant change in the current visual quality of the area along the route. The section of the line that would be placed between the Westland Substation and the cogeneration plant would be new involving adding conductor to an existing line, and constructing new poles and line. The section of the line that would be located next to Feedville Road for 3.2 km (2 miles) would be seen by people driving on Feedville Road. However, because of the presence of other transmission lines in the this area, the visual impact of the additional line along Feedville Road would be minor.

The 12.9-km (8-mile) long UECA 115-kV relocation would occur in an area that currently has several transmission lines passing though it on the way to the McNary Substation. The addition of the UECA 115-kV line would have minimal impacts on the visual quality of the area lines would pass through.

4.12.2 Effects on Key Viewing Areas

Primary viewers in the vicinity of the proposed project would consist of travelers on local roads, travellers on interstate highways, and to a lesser degree, viewers from residences. The greatest number of viewers of the cogeneration facility would be travelers on I-84 and SR 207, which are approximately 1.6 to 1.2 km (1 to 0.75 mile) away, respectively, from the cogeneration facility site. Project transmission lines would also be visible from roads and highways, and in some locations would pass over roads and highways.

To simulate effects of project components and transmission line alternatives on visual quality in the project vicinity, two key viewing areas (KVAs) were selected (Figure 4.12-1). The two KVAs were chosen to give an indication of how the cogeneration facility and two transmission line alternatives would affect viewers. KVA-1 is located at the intersection of I-84 and SR 207. It represents the views that travellers on local roads and interstate highways would have of the cogeneration facility. KVA-2 is located at the intersection of Highway 395 and Feedville Road. It was selected to represent a closeup view from roads primarily used by local traffic of the visual impacts associated with the

Eastern 500-kV Alternative. The existing visual conditions near the two KVAs are discussed below, as are the visual impacts associated with the proposed project.

KVA-1 (Intersection of SR 207 and I-84)

Viewpoints from which the public might view the cogeneration facility are located along major roadways, including I-84, Feedville Road, and Umatilla Meadows Road. Because of the high speeds at which motorists travel along highways, views of the facility would be temporary and would be seen as background views within the context of a panoramic view of the landscape. Views of the facility along Feedville and Umatilla Meadows roads would continue for a greater period of time and at closer distances.

The cogeneration facility site can be seen from KVA-1, which is located in the parking lot of a mini-mart on SR 207 adjacent to and to the north of I-84. The cogeneration facility site is approximately 1 km (0.75 mile) northeast of KVA-1. Figure 4.12-2a depicts the existing scene of the proposed project site and the J.R. Simplot facility as seen from KVA-1. Figure 4.12-2b is a photo-simulation that depicts what the scene would look like with the cogeneration facility in place.

KVA-2 (Intersection of Highway 395 and Feedville Road)

KVA-2 is located on Highway 395 at the intersection with Feedville Road. KVA-2 is situated in agricultural lands near the intersection of Highway 395 and SR 207. As depicted in Figure 4.12-3a, existing transmission lines parallel both Highway 395 and Feedville Road, which is a segment of the Umatilla County Scenic-Historic Road. Viewers from this KVA would be travelers on Highway 395 and Feedville Road.

The Eastern 500-kV Alternative would parallel the south side of this section of Feedville Road and would cross Highway 395. As depicted in Figure 4.12.3-b, the new poles and conductors would introduce another transmission line to the view from Highway 395.

Because of the presence of existing transmission lines along Highway 395 and Feedville Road, and the number of other transmission lines in the general vicinity, the visual impact of the Eastern 500-kV Alternative on viewers from KVA-2 would be low.

4.12.3 Mitigation

The following mitigation measures will be employed to minimize visual impacts:

- The two emission stacks will be painted in a matte-finished neutral color to prevent glare caused by reflective surfaces. Light colors such as light gray, gray-blue, or beige are most likely to blend with the surrounding area.
- Outdoor lighting at the cogeneration facility will be limited to the extent necessary to maintain safe conditions, and would consist of downward directional lights. Stair lighting would be manually engaged so that the stairs remain unlighted when not in use.
- A buffer zone of landscaping along the western and southern perimeter of the cogeneration facility site consisting of trees and shrubs will be constructed to enhance the visual qualities of the facility.
- All pipeline construction ROWs will be reseeded as soon as possible after burial of the pipe to reduce visual impacts associated with cleared ROW.

4.12.4 Unavoidable Adverse Impacts

The cogeneration facility and especially the emission stacks would be seen at times up to 8 km (5 miles) away. However, the cogeneration facility structures would be visually compatible with the nearby industrial and agricultural facilities, and would have a low adverse visual impact on the visual quality of the surrounding area.

Eastern 500-kV Alternative. The Eastern 500-kV Alternative transmission line along Feedville Road and the McNary-Roundup Corridor, and Highway 395 would be seen by travellers on roads and highways in the vicinity and to residences close to the corridor. The visual impact to travelers would be considered low because of the brief time the transmission lines would be viewed. However, the visual impact to adjacent residences is considered moderate. Although the visual impact to adjacent residences is greater than the impact to local travelers, it is considered moderate rather than high because of the existence of other transmission lines in the immediate area. The McNary-Lower Monumental 500-kV Relocation would cross Highway 395. However, due to the presence of other lines crossing the highway as they converge at the McNary Substation, the visual impacts of the relocated transmission line would be low.

Western 230-kV Alternative. The only project component of the Western 230-kV Alternative that would have a visual impact would be the 3.2-km (2-mile) section of the line that would parallel Feedville Road. Because of the presence of an existing transmission line and industrial and agricultural facilities in the Feedville Road area, the impact of the line to the visual quality of the area near Feedville Road is considered low. The UECA 115-kV line relocation would occur in an area where other transmission lines are present. Thus, the 115-kV line would have low impacts on the visual quality of the area.

4.12.5 Cumulative Impacts

The cogeneration facility would cumulatively add to the industrial character of the area near the facility. It would be visually consistent with the industrial land use designation for the area, and would be similar in appearance with existing (and most likely future) agricultural and industrial facilities and is considered to have a low cumulative impact.

Eastern 500-kV Alternative. Because much of the Eastern 500-kV Alternative route would follow existing ROWs, the alternative's transmission line would have low impacts on the cumulative visual quality in the region. The section of the line that would follow Feedville Road would have a low impact on visual quality due to the presence of other transmission lines, and industrial and agricultural facilities that can be seen from Feedville Road. The rerouted McNary-Lower Monumental would be viewed by travelers on Highway 395 as they travel near the McNary Substation. However, due to the presence of other transmission lines that cross Highway 395, the cumulative visual impact of this route would also be low.

Western 230-kV Alternative. The Western 230-kV Alternative would also have low impacts on the visual quality of the areas along its route. Where the line would follow Feedville Road, it's visual impact would be low for the same reasons explained above for the Eastern 500-kV Alternative. The UECA 115-kV relocation route would be located in and area that contains existing transmission lines, and thus would have low cumulative impacts on adjacent visual quality.

5.0 ENVIRONMENTAL CONSULTATION, REVIEW, AND PERMIT REQUIREMENTS— —HERMISTON

5.1 National Environmental Policy Act

This EIS has been prepared by BPA pursuant to regulations implementing National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 et seq.), which requires Federal agencies to assess the impacts that their actions may have on the environment. BPA's potential acquisition of power from the Hermiston Power Project requires that BPA assess the potential environmental effects of the proposed project and describe them in an EIS.

5.2 Threatened and Endangered Species and Critical Habitat

The Endangered Species Act (ESA) of 1973, as amended (16 USC 1536), requires Federal agencies to ensure that their actions do not jeopardize endangered or threatened species or their critical habitats. Sources of information for the potential occurrence of sensitive species in an area include both Federal and state lists. BPA has consulted with the USFWS and NMFS pursuant to Section 7 of the ESA, as amended, 16 USC 1531 et seq., Public Law 97-304.

Letters were sent to USFWS requesting lists of threatened and endangered wildlife and plant species in the vicinity of the proposed project. The USFWS responded that two Federally listed wildlife species, the bald eagle and the peregrine falcon, may occur in the vicinity of the project. Two listed fish species, the chinook salmon and the Snake River sockeye salmon, occur in the project vicinity (see Chapter VI, Appendix B, Biological Assessment).

The developer should consult with USFWS and appropriate state agencies close to the time of construction. Also, the developer should consult with BPA and appropriate agencies to determine if additional surveys are warranted for any Federally or state-listed species that are on the list at that time.

5.3 Fish and Wildlife Conservation

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 et seq.) encourages Federal agencies to converse and promote conservation of non-game fish and wildlife species and their habitats. The Fish and Wildlife Coordination Act (16 USC 661 et seq.) requires Federal agencies undertaking projects affecting water resources to conserve or improve wildlife resources. Potential impacts to fish and wildlife from the project are discussed in Section 3.6.

5.4 Cultural Resource (Heritage Conservation)

Cultural resources, also called heritage resources or historic properties, include resources significant in American history, architecture, archaeology, engineering, and traditional culture.

Historic properties can be archaeological sites, historic architecture and engineering, or resources of heritage significance to Native Americans and other cultural groups. Historic properties may be districts, sites, buildings, structures, or objects.

The significance of historic and cultural properties lies both in their heritage and scientific value. Historic sites and historic architecture and engineering are embodiments of a technological and historical heritage. Archaeological sites are the raw material from which scientists reconstruct specific events and general trends of prehistory and therefore have scientific value. Traditional cultural properties embody significant patterns of culture.

The National Historic Preservation Act of 1966 as amended (16 USC 470) requires Federal agencies with land management or permitting authority to take into account the potential effects of their undertakings on properties that are eligible for nomination to the NRHP. The agency must consult with the SHPO regarding the inventory and evaluation of properties potentially eligible for NRHP nomination and to determine whether the undertaking would adversely affect them. The Hermiston Power Project would involve a permit or agreement with a Federal agency and is therefore a Federal agency undertaking. According to NEPA (40 CFR 1508.27), the project would have a significant impact on cultural resources if it would disturb or disrupt:

- a property of historic or cultural significance to a community or ethnic or social group;
- a property that is listed on or is eligible or potentially eligible to be listed on the NRHP; or
- a property state or local agencies have designated as historically important, such as a state historic landmark.

Potential impacts to Heritage Conservation (Cultural Resources) from the proposed project are discussed in Section 3.8.

5.5 State, Areawide, and Local Plan and ProgramConsistency

Consistency

The project will be located in two jurisdictions: Umatilla County and the city of Umatilla. The Umatilla County Comprehensive Plan and the city of Umatilla Comprehensive Plan govern development in the project area. All project components (transmission lines, gas pipelines, and water and wastewater pipelines) are considered either permitted or conditional uses in all county or city land use designations they would be located in or pass through.

Construction of the cogeneration facility will permanently change existing land use at the site from agricultural to industrial. The other project components will not change the land uses of the lands they pass through, although they could temporarily (for one growing season) impact farming activities on agricultural lands.

5.6 Coastal Zone Management Program Consistency

The proposed project is not in the coastal zone, nor would it directly affect the coastal zone.

5.7 Floodplains

Executive Order 11988 requires that floodplains be avoided to the extent possible. The proposed cogeneration facility, the water supply line, and the NWP gas supply line all lie above the 100-year floodplain designated by FEMA. One short section of the PGT gas pipeline encroaches on the 100-year floodplain. The Eastern 500-kV Alternative route does not cross any 100-year floodplain. The Western 230-kV Alternative route crosses the 100-year floodplain of the Umatilla River in two locations. However, because the transmission poles will not be placed in the floodplain, no significant impact is anticipated. The lines will be suspended above the floodplain high enough that they would be unaffected by floods.

5.8 Wetlands

Construction is unlikely to impact wetland resources. However, the Eastern 500-kV Alternative may require that electrical transmission poles or towers be placed in one wetland. Additionally, the PGT gas supply line may cross the edge of one wetland. Should such construction be required, consultation with the Corps regarding compliance with Sections 401 and 404 of the Clean Water Act and possibly Section 10 of the Rivers and Harbors Act, and with the ODFW and ODEQ.

5.9 Farmlands

The Farmland Protection Policy Act (7 USC 4201 et seq.) directs Federal agencies to identify and quantify adverse impacts of Federal programs on farmlands. The Act's purpose is to minimize the number of Federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to non-agricultural uses.

Approximately 6.9 ha (17 acres) of prime farmland (based on soil type) would be permanently lost to agricultural production as a result of building the cogeneration facility. However, since this land is committed to urban development in the Umatilla County Comprehensive Land Use Plan, it is not protected under the Farmland Protection Policy Act. A maximum of 29 ha (71 acres) of prime farmland could be temporarily disturbed during construction of the water supply, wastewater, electrical transmission lines, and gas lines. However, soils would be stocked and replaced, and there would be no permanent loss of farmland.

5.10 Recreation Resources

None of the project components would be located near any existing recreation facilities or near any areas where dispersed recreation is known to occur. There would be no impacts to recreation from the project.

5.11 Global Warming

The Hermiston Power Project would emit the greenhouse gases carbon dioxide (CO_2) and methane. The burning of natural gas produces CO_2 as the primary combustion product. The proposed cogeneration plant would also emit small amounts of methane as unburned fuel.

Combined-cycle cogeneration plants burning natural gas, like the proposed project, emit less CO_2 per kilowatt of power generated than any other power generation method using fossil fuel. There are three main reasons for this. First, combustion turbines are the most efficient means of producing power from fossil fuels. For each British thermal unit (Btu) of fuel input, a combustion turbine can produce more kilowatts of power output than any other type of fossil fuelfired power plant. Second, the carbon content of natural gas is 40 percent lower than coal and 25 percent lower than oil per Btu. This means that burning natural gas produces less CO_2 than burning an equivalent amount of either coal or oil. Third, the heat recovery steam generator produces power from the exhaust steam of the combustion turbine without the need to burn additional fuel. Fourth, sending some of the steam produced by the heat recovery steam generator to the Simplot plant for potato processing allows the potato plant boilers to be shut down. This improves the overall energy use of the cogeneration plant. This greatly increases the amount of power generation per unit of fuel burned compared to a simplecycle power plant. From a global warming perspective, cogeneration plants like the Hermiston Power Project are the best method of power generation using fossil fuels.

5.12 Permit for Structures in Navigable Waters

The proposed project does not include work or structures that are in or on any navigable waters of the United States as defined in the Rivers and Harbors Act of 1899 (33 USC 403).

5.13 Permit for Discharges into Waters of the United States

Discharge of dredged or fill material into waters of the United States (including wetlands) is regulated by the Corps pursuant to Section 404 of the Clean Water Act. One Section 404 permit will possibly be required for the PGT natural gas pipeline. Permits for crossings of public lands will be required from the Bureau of Land Management (for the 500-kV transmission lines) and from the Bureau of Reclamation (for both the 230-kV and 500-kV transmission lines). There is no proposed discharge of dredged or fill materials into waters of the United States from the proposed project.

5.14 Permits for Right-of-Way on Public Lands

The Eastern 500-kV Alternative and the Western 230-kV Alternative each cross a narrow strip of land owned by USBR. An easement application has been submitted by the developer. The Eastern 500-kV Alternative crosses 2 parcels owned by the BLM. An easement application has been submitted by the developer. A highway ROW held by State of Oregon would be used for a portion of the Western 230-kV Alternative and the water supply line.

5.15 Energy Conservation at Federal Facilities

Not applicable.

5.16 Pollution Control

5.16.1 Air

Emissions produced by the proposed project must meet standards established by the EPA. The Clean Air Act is the principal Federal law governing air pollution control. It was most recently amended in 1990. In the project vicinity, authority for ensuring compliance with the provisions of the Clean Air Act is delegated to the ODEQ.

The 430 MW Hermiston Power Project would be considered a major new source. Air quality permitting for sources that emit more than 91 MTY (100 TPY) of a regulated air pollutant is the responsibility of the ODEQ. ODEQ has established an air pollution control program to maintain acceptable air quality in areas where concentrations of criteria air pollutants are less than state and national AAQS. There is one nearby area (Eagle Cap Wilderness Area) that has been designated by Congress for special protection from air pollutants that might affect soils, vegetation, visibility, and other natural resources. These areas are designated as Class I under the Federal PSD program.

ODEQ has established regulations for new sources to ensure that ambient air quality remains acceptable and to protect Class I areas. These regulations and their supporting information are contained in the State Implementation Plan (SIP), a plan adopted by the state to ensure that air quality objectives are met. The SIP for Oregon has been approved by the EPA. An essential element of the plan is an engineering review process to ensure that new sources comply with all regulations (NSR). Sources constructed under the PSD program are required to maintain air pollution control equipment in proper working order and to periodically test the emissions to demonstrate compliance with emission limitations. ODEQ also administers a plan for controlling emissions of TAPs. New sources emitting toxic or carcinogenic air pollutants must also demonstrate that the concentrations resulting from these emissions are less than the SILs.

5.16.2 Water

Wastewater discharges to the water bodies of the United States are regulated under the Clean Water Act. The proposed cogeneration facility would discharge wastewater, not to a water body, but onto land for irrigation purposes. The J.R. Simplot Company intends to reuse this wastewater in their recycle system which irrigates nearby agricultural lands with process water from an existing year-round processing plant in Hermiston, Oregon. The Simplot recycle system operates under a WPCF permit which is issued by the ODEQ. This system would apply the cogeneration facility wastewater to the land during the growing season only.

5.16.3 Solid and Hazardous Waste

Solid waste generated at the proposed cogeneration facility site would consist mostly of packing crates, wastes from maintenance, wastes from normal employee activities, and filter cake from water treatment facilities. Solid wastes would be collected by a local contractor for disposal at a nearby

Table 5.16-1 Allowable Noise Levels

Statistical Noise Level	Measurement Period	
	7am to 10pm	**10pm to 7am**
L50	55 dB(A)	50 dB(A)
L10	60 dB(A)	55 dB(A)
L1	75 dB(A)	60 dB(A)

Source: OAR-340-35-035

local landfill. The Resource Conservation and Recovery Act (RCRA), as amended, is designed to provide a program for managing and controlling hazardous waste by imposing requirements on generators and transporters of this waste, and on owners and operators of treatment, storage, and disposal (TSD) facilities. Each TSD facility owner or operator is required to have a permit issued by EPA or the state. Construction and maintenance activities at the proposed project will generate small amounts of hazardous waste. These typically include: solvents, pesticides, paint products, motor and lubricating oils, and cleaners. Under EPA regulations, the amounts of these wastes generated by the proposed project would fall within the definition for a "small quantity generator." The developer will formulate a hazardous waste management program that meets all Federal and state hazardous waste requirements. The project would comply with all Federal and state regulations dealing with the use, storage, and disposal of hazardous materials and hazardous wastes including those covered under Division V of the 1991 Uniform Fire Code, entitled "Stationary Tank Storage, Aboveground, Outside of Buildings."

5.16.4 Noise

Oregon noise regulations prohibit a new industrial or commercial source from causing an increase in ambient statistical noise levels (L10 or L50) in residential areas by more than 10 dB(A), or exceeding the levels shown in Table 5.16-1. Temporary, daytime construction activities are exempt from the regulations.

The proposed project is subject to maximum allowable levels of noise by the state of Oregon (OAR 340-35-035). Regular operation of the project with mitigation as proposed would comply with noise standards for nearby sensitive receptors. Potential noise-related impacts of project construction and suggested mitigation measures are discussed in Section 3.4.

5.16.5 Pesticides

The proposed project would not use or produce pesticides, and would not be affected by regulation regarding the purchase, use, storage, or disposal of pesticides.

5.16.6 Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) requires notification to EPA of new chemicals and regulates the production, use, and disposal of toxic substances. Of particular interest to the production of electricity is the regulation of polychlorinated biphenyls (PCBs). EPA banned the manufacture, processing, distribution in commerce, and use of PCBs on January 1, 1978 except in totally enclosed electrical equipment or under specific authorized uses. The proposed project would not involve the distribution, use, or disposal of PCBs.

5.16.7 Asbestos

There would be no asbestos used in the proposed project.

5.16.8 Comprehensive Environmental Response, Compensation, and Liability Act

A Phase I Environmental Site Assessment was completed for the proposed project site which indicated that no hazardous materials are present at the site.

5.16.9 Radon

There is no evidence to suggest that the proposed project vicinity is affected by regulations concerning radon gas, or would be affected by the Radon Gas and Indoor Air Quality Research Act of 1986 (42 USC 7401).

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7.0 PUBLIC COMMENTS ON THE DRAFT EIS AND RESPONSES— — HERMISTON

7.1 Draft EIS Public Review Process

In February 1995, the BPA released a draft EIS to address the environmental consequences of its proposed RCP. Availability of the draft EIS was publicized through a notice placed in the Federal Register on February 17, 1995 and through BPA's monthly "Journal" publication. A summary of the draft EIS was sent to those on the BPA RCP mailing list established during the scoping phase. The full draft EIS was sent to those requesting the complete document.

A 45-day period (extended to 57 days) for accepting public comments on the draft EIS began upon publication of the notice of availability in the Federal Register. During this period, BPA received comments on the document from private citizens, civic organizations, and state, local, and Federal government agencies. Comments were received in the form of letters and phone calls, and through oral and written testimony given at three public hearings sponsored by BPA one for each of the three proposed projects. Below are listed the dates and locations for each hearing:

Hermiston Hearing
Tuesday, March 14, 1995
Hermiston Civic Recreation Center
215 W. Orchard Avenue, Hermiston, Oregon

Satsop Hearing
Thursday, March 16, 1995
Elma High School, Commons Room
1011 W. Main Street, Elma, Washington

Chehalis Hearing
Thursday, March 23, 1995
W.F. West High School, Commons Room
342 SW 16th, Elma, Washington

Hearings began with an open house from 6:00 PM to 7:00 PM, which provided participants an opportunity to view exhibits about the RCP and talk with project staff. The formal hearing began at 7:00 PM with a slide presentation about the project, followed by statements from the public. In addition to giving oral testimony, participants were provided with comment sheets on which to write their testimony if they so chose. Copies of the Executive Summary to the draft EIS, as well as the complete draft, were available for distribution at all hearings. To publicize hearings, display advertisements were placed in local newspapers two weeks, and again two days, prior to hearings.

7.2 Draft EIS Comment Review Process

All comment letters and hearing testimony were reviewed initially by RCP EIS staff for overall content and subject matter. The purpose of this initial review was to categorize comments so they could be directed to the RCP EIS team members most knowledgeable about a given subject matter. To keep track of comments and responses, each comment was assigned a code number. Individual comments were then responded to by EIS team members.

7.3 Comments and Responses

(Requires Adobe Acrobat)

This section provides a listing of all comments received about the Hermiston Power Project and the RCP in general (Table 7-1), followed by reproductions of comments with their respective responses. Comments and responses are grouped in the following categories:

1) Oral testimony received at the Hermiston public hearing

2) Letters from individuals

3) Letters from organizations

4) Letters from government agencies

Table 7-1. Comments Received on the DEIS Relating to the RCP and the Hermiston Power Project

Name/Organization	Commentor Code
Oral Testimony at Public Hearing	
Byron Grow	HH1
Allan Lambert	HH2
Jerry Pratton	HH3
Frank Harkenrider	HH4
David Hawk	HH5
Tamara Mabbott/Umatilla Planning Dept.	HH6
Letters from Individuals	
Mr. & Mrs. A. Lambert	HI1
Laura Nielson	HI2
Alfred Canada	GI1
Letters from Organizations	
John Williams/Plumbers and Steamfitters Local 342	HO1 & GO1
Letters from Government Agencies	
Washington State Energy Office	GG3 & HG1
U.S. Forest Service	GG5
U.S. Environmental Protection Agency	GG6

Comments related to the Satsop or Chehalis projects are addressed in the RCP Washington EIS.

8.0 LIST OF PREPARERS

The Resource Contingency Program EIS is being prepared by BPA with the technical assistance of Foster Wheeler Environmental Corporation, formerly Enserch Environmental and Ebasco Environmental, a consulting firm under contract to BPA. Individuals responsible for preparing the draft EIS are listed below.

8.1 BPA EIS Team

Diffely, Robert J. EIS Manager. Responsible for the coordination and completion of all environmental requirements through preparation of DEIS. Education: B.S., M.S., Economics. With BPA since 1989.

Boorse, Dawn. EIS Manager. Response for the coordination and completion of all environmental requirements from DEIS through preparation of the FEIS. With BPA since 1980.

Dwonch, Tom. Snake River Area State and Local Government Coordinator. Responsible for liaison and public involvement activities in the Hermiston Project area. Education: B.S., Landscape Architecture. With BPA since 1982.

Freeman, Roxane J. EIS Reviewer. Responsible for financial analysis, contract drafting, and negotiations. Education: J.D. and B.A., Economics. With BPA since 1982.

Oster, Dennis. Program Manager. Responsible for the development and implementation of the Resource Contingency Program. Education: B.S., Physical Geography. With BPA since 1975.

Spiering, Colleen A. Environmental Specialist. Responsible for health impacts, coordination and analysis with respect to electric and magnetic fields (EMF). Education: Masters of Public Health, Health Education, and Planning; B.S., Health Education. With BPA since 1991.

Stearns, Richard D. Electrical Engineer. Responsible for engineering aspects of health and safety data. Education: B.S. Electrical Engineering; M.S. Electrical Engineering. With BPA since 1978.

Ward, Kevin A. Environmental Specialist. Responsible for NEPA compliance activities, preparing EAs and EISs on transmission line, substations, power sales contracts, and fish and wildlife program activities. Education: B.S., Resource Management. With BPA since 1983.

8.2 Foster Wheeler Environmental EIS Team

Antieau, Clay. Botanist. Nine years of experience in conducting wetland and botanical resource investigations and managing environmental review and compliance, focusing on wetland and rare plant resources. B.S., Horticulture; M.S., Botany; Ph.C., Botany.

Barber, David. Public Involvement Coordinator and Technical Writer/Editor. Four years of experience developing and managing public involvement programs, writing public information materials, and editing technical reports. B.S. Psychology; M.A. Geography.

Broadfoot, David. Project Manager. Twenty years of experience in project management; evaluation of landuse, socioeconomic, recreation, visual quality, and other environmental impacts from energy and natural resources development projects; and preparation of NEPA compliance documents.

Burns, Dennis. Resource Planner. Ten years of experience in planning, including survey research, landuse and recreation planning, economic analysis, and data processing. Education: B.S., Economics; M.Ag., Recreation and Resources Development.

Carr, Peter. Technical Writer/Editor. Five years of experience including technical writing and editing, document design and production, community education and public involvement, and journalism. Education: B.S., Journalism.

Davy, Douglas. Historical and Archaeological Resources Specialist. Fourteen years of experience in cultural resources management including historic and prehistoric archaeology, historic architectural and engineering assessment, and Native American consultation. Education: B.A., Anthropology; M.A., Ethnology; Ph.D., Archaeology.

Graham, Bryan. Hazard Materials Specialist. Five years of experience in environmental science, geology and analytical chemistry related to hazardous waste site assessments, decommissioning, and remediation. Education: B.A., Geology.

Greenig, Mark. Landscape Resource Planner. Thirteen years of experience in environmental impact assessment, recreation planning, visual resource analysis, site planning, and land use analysis. Education: B.S., Landscape Architecture; M.U.P., Master of Urban Planning.

Greenstein, Ami. Economist/Planner. Five years experience in environmental assessment, socioeconomic studies, and economic analysis. Education: B.S., Accounting and Management; M.A., Development Economics.

Hall, Ellen. Senior Reviewer. Twenty years of experience in energy and natural resource planning and permitting, economic analysis, socioeconomic impact assessment, and environmental analysis. Education: B.A., History/Economics; M.Ag., Agricultural Economics; Ph.D., Resource Economics.

Hummer, Peter. Meteorologist. Seventeen years of experience in air quality and meteorological monitoring studies, and developing air quality permit applications. Education: B.S., Meteorology and Oceanography, M.S., Physical Oceanography.

Jackson, Garrett. Geologist. Five years of experience in applied geomorphology, mapping of stream channels and fluvial deposits, and geologic hazard evaluations. Education: B.S., Geosciences; M.S., Geosciences.

Knutzen, John. Aquatic Biologist. Seventeen years of experience evaluating developmental activity impacts to lakes, rivers, and streams, water quality, and aquatic resources. Education: B.A., Biology; M.S., Fisheries.

Martin, Tom. Water Resource Engineer. Thirteen years of experience in water resource engineering and environmental information systems. Education: Electronics, Civil Engineering. Registration: Professional Engineer, Washington, Maine.

Miller, Keith. Chemist. Six years of experience in power plant engineering and chemistry, including three years in water chemistry control. Education: B.S., Chemistry.

Richards, Tim. Graphic Designer. Eighteen years of experience in graphic design, illustration, mapping, and report presentation.

Rogers, Robert. Geologist. Six years of experience in geologic mapping. Applied geomorphotography and geologic hazard evaluations. Education: B.S., Geology, M.S., Geology.

Rude, Jennifer. Wildlife Biologist. Four years of experience in habitat evaluation, environmental and biological assessments, wildlife surveys, vegetation/habitat mapping, and data management. Education: B.S., Zoology.

Seaver, Stacie. Technical Writer/Editor. Four years of experience including technical writing and editing, and document design and production. Education: B.A., English.

Smultea, Mari. Wildlife Biologist. Eleven years of experience in wildlife studies and surveys, particularly threatened and endangered species, for Biological Assessments, Environmental Impact Statements, Environmental Assessments, Biological Evaluations, and Hydropower License Applications. Education: B.A., Ecology; M.S., Wildlife Science.

Tressler, Ron. Wildlife Biologist. Nine years of experience in habitat evaluation, biological assessments for threatened and endangered species, wildlife surveys, and vegetation characterization. Education: B.S., Wildlife Science; M.S., Wildlife Resources.

<1> Significant means a fire or explosion that engulfs or damages an area outside of its primary point of origin.

GLOSSARY

A-1	Agricultural-1
A-2	Agricultural-2
AAQS	Ambient air quality standards
a-c	Alternating-current
Access roads	Roads that are necessary to first construct and then to maintain a transmission line. Access roads are initially built where no roads conveniently exist. Where country roads or other access is already established, access roads are constructed as spurs directly to the structure sites. Access roads are usually maintained to provide access to tower sites, except where they pass through cultivated land.
ADLN	"Advanced" dry low-NO_x
ADT	Average daily traffic
Alluvium	Unconsolidated deposits of transported particles.
Ambient air	Air surrounding a particular spot, such as a power plant.
Anadromous fish	Fish, such as salmon or steelhead trout, that hatch in freshwater, migrate to and mature in the ocean, and return to freshwater as adults to spawn.
Aquifer	A geologic formation or structure that contains and transmits water in sufficient quantity to supply the needs for water development. Aquifers are usually saturated sands, gravel, or fractured rock.
ASIL	Acceptable Source Impact Level
ATDM	All Terrain Dispersion Model
Attainment area	A geographic area where the concentration of specific air pollutants does not exceed Federal standards.
Average megawatt (aMW)	The number of megawatts that could be produced by a power plant multiplied by the percent of time the power plant would normally be in operation over a specific period of time, usually one year.
BACT	Best Available Control Technology. An emission limitation based on the maximum degree of reduction of each pollutant subject to regulation and emitted from, or which results from, any major emitting facility.
	Biological oxygen demand

BOD	
BP	Before present
BPA	Bonneville Power Administration
British thermal unit (Btu)	A quantity of heat necessary to raise the temperature of 0.45 kg (1 pound) of water 1·F.
Capacity	A measure of the ability of a transmission line to carry electricity.
CARB	California Air Resources Board
CDFO	Canadian Department of Fisheries and Oceans
Centimeter (cm)	A unit of measurement (in the metric system) equivalent to 0.3937 inches.
CFR	Code of Federal Regulations
cfs	Cubic feet per second
Class I Area	Area designated for the most stringent degree of protection from the future degradation of air quality.
Class II Area	Any area cleaner than the Federal air quality standard designated for a moderate degree of protection from future air quality degradation. Moderate increases in new pollution may be permitted in a Class II area.
cms	Cubic meters per second
CO	The chemical formula for carbon monoxide. Carbon monoxide is a colorless, odorless, and poisonous gas formed by incomplete combustion of carbon or a carbonaceous material, such as gasoline and natural gas.
CO_2	The chemical formula for carbon dioxide. Carbon dioxide is a colorless, odorless, incombustible gas formed during respiration, combustion, and organic decomposition, and commonly used in food refrigeration, carbonated beverages, inert atmospheres, fire extinguishers, and other aerosols.
Cogeneration	The technology of producing electrical energy together with useful thermal or mechanical energy for industrial or commercial purposes, through the sequential use of an energy source.
Combined-cycle	The use of waste heat from a gas turbine topping cycle for the generation of electricity in a steam turbine generator system, thereby increasing the efficiency of heat use.
CT	Combustion turbine. An integral part of cogeneration facilities operating on fuels that are capable of converting heat energy into electrical energy.
Corps	U.S. Army Corps of Engineers
Council	Northwest Power Planning Council

CRBG	Columbia River Basalt Group
CRP	Conservation Reserve Program
CSZ	Cascadia Subduction Zone
Cubic feet per second (cfs)	A unit of measurement pertaining to flow or discharge of water. One cfs is equal to 449 gallons per minute.
Cultural resources	Nonrenewable evidence of human occupation or activity as seen in any district, site, building, structure, artifact, ruin, object, work of art, architecture, or natural feature that was important in human history at the national, state, or local level.
Cumulative impact	The impact on the environment that results from an action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time.
CZMA	Coastal Zone Management Act
dB	Decibel. Logarithmic ratio between pressure caused by a given sound and the standard sound pressure.
dB(A)	The first two letters (dB) are an abbreviation for the term "decibel," the unit in which sound is most commonly measured. The last letter (A) is an abbreviation for the scale (A scale) on which the sound measurements were made. A decibel is a unit for expressing relative difference in power, usually between acoustic signals, equal to 10 times the common logarithm of the ratio of the two levels.
DO	Dissolved oxygen
ECRM	Erosion Control, Revegetation, and Maintenance
EFSC	Energy Facility Siting Council
EIS	Environmental Impact Statement. A document defined at 40 CFR 1508.11 and prepared in accordance with the requirements of section 102(c) of NEPA, the Council on Environmental Quality Regulations, and Department of Energy NEPA guidelines.
Electric and magnetic field (EMF)	The two types of fields of force that are produced by electricity, i.e., those that are produced by voltage (electric fields) and those that are produced by current (magnetic fields). Electric fields are produced by the force that causes current to flow through a conductor (voltage) and are measured by kilovolts per meter (kV/m). Magnetic fields are produced by the force that causes electrons to move in a conductor (current) and are measured in milligauss (mG).
Emergent	As used here, a plant that is rooted and has parts extending above a water surface.
Emissions	Substances discharged into the environment as waste material, such as discharge into the air from cooling towers or discharges into the water from waste streams.
EMS	Emergency Medical Services
EMT	Emergency Medical Technician

Endangered species	A plant or animal that is in danger of extinction throughout all or a significant portion of its range because its habitat is threatened with destruction, drastic modification, or severe curtailment, or because of overexploitation, disease predation, or other factors; Federally listed endangered species are officially designated by the U.S. Fish and Wildlife Service.
Environmentally Sensitive Area	Region that has wetlands, steep slopes, floodplains, parks, recreation facilities, and public preserves.
Eocene	Period of geologic time extending from about 38 to 55 million years ago.
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
ESCP	Erosion and Sediment Control Plan
Eutrophication	Prolific plant growth
FEMA	Federal Emergency Management Agency
FEMAT	Forest Ecosystem Management Team
FERC	Federal Energy Regulatory Commission
Fish and Wildlife Conservation Act	Encourages Federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitat.
Fish and Wildlife Coordination Act	Requires Federal agencies undertaking project affecting water resources to consult with the USFWS and the state agency responsible for fish and wildlife resources to conserve or improve wildlife resources.
FPD	Fire Protection District
g	Acceleration of gravity
GD-1	General Development-1
GD-5	General Development-5
Geologic hazard	A geologic condition, either natural or man-made, that poses a potential danger to the life and property, e.g. landslides.

GEP	Good Engineering Practice
GIS	Geographic Information System
gpd	Gallons per day
gpm	Gallons per minute
Groundwater	The supply of fresh water under the earth's surface in an aquifer or soil.
Growth Areas	Area where most new growth is to be directed, and where density housing and commercial development may occur. Also, area where expenditures will be focused for urban levels of utilities and other public services.
GWCA	Ground Water Control Area
Habitat	The environment occupied by individuals of a particular species, population, or community.
Hectare (ha)	An area equivalent to 10,000 square meters or 2.471 acres.
HNO_3	Nitric acid
HRA	Historical Research Associates, Inc.
HRS	Heat recovery steam generator
I-82	Interstate 82
I-84	Interstate 84
Industrial Area	Area where several industrial land uses may be concentrated, usually large amounts of land are available, near major transportation corridors, and where major utility services are available or the potential for utility extension exists. An Industrial Area is to receive primary attention for utility and road service, and promotional efforts.
Impact	Positive or negative environmental consequences of a proposed action.
ISCST2	Industrial Source Complex Short Term
IWD	Industrial waste discharge
kg	Kilograms
km	Kilometer. One thousand meters
	Kilovolt. One thousand volts

kV	
KVA	Key Viewing Area
kV/m	Kilovolts per meter
kWh	Kilowatt hour
l	Liter
LAER	Lowest Achievable Emission Rate
L_{eq}	A symbol that represents the logarithmically weighted average noise level.
Liquefaction	Liquid-like behavior of a solid material.
LOS	Level of Service
lpd	Liters per day
lpm	Liters per minutes
M	Magnitude
m.y.BP	Million years before present
MCE	Maximum Credible Earthquake. The largest event that is believed to be reasonably possible at the project site on the basis of geological and seismological evidence considering both regional and local influences.
MCL	Maximum contaminant level
MW	Megawatt. One thousand kilowatts (kW) or one million watts (W).
m	Meter. Unit of length equal to 3.28 feet.
Methane	An odorless, colorless, flammable gas formed by the anaerobic decomposition of organic matter. Methane (CH4) is the major component of natural gas, making up 90 to 95 percent of the volume. In addition to its use as fuel, methane is an important source of hydrogen and is used in a wide variety of organic compounds.
mG	Milligauss
mg/l	Milligrams per liter
Miocene	Period of geologic time extending from about 5 to about 24 million years ago.

Mitigation	Actions to avoid, minimize, reduce, eliminate, or compensate for the impact of a proposed activity or management practice.
MMI	Modified Mercalli Intensity
MP	Milepost
mph	Miles per hour
msl	Mean sea level
MTY	Metric tons per year
MWh	megawatt hour
NAGPRA	Native American Graves Protection and Repatriation Act
National Historic Preservation Act	Requires Federal agencies with land management or permitting authority to take into account the potential effects of their undertakings on properties that are eligible for nomination to the National Register of Historic Places.
Natural Gas	A mixture of hydrocarbon gases that occurs with petroleum deposits, chiefly methane, together with varying quantities of ethane, butane, propane, and other gases. In addition to its use as a fuel, it is commonly used in the manufacture of organic compounds.
NCAP	(2-57)
NEPA	National Environmental Policy Act. Major Federal legislation passed by Congress in 1969 that requires the environmental impacts of major Federal actions be identified in a detailed statement of environmental impact, along with reasonable alternatives to the proposed actions. Furthermore, environmental impacts must be made known to the public and to the decisionmaker, prior to a decision being made on the project.
NESC	National Electrical Safety Code
NGS	National Geographic Society
NMFS	National Marine Fisheries Service
NO_2	The chemical formula for nitrogen dioxide. Nitrogen dioxide is a mildly poisonous brown gas often found in exhaust fumes and smog. It is synthesized for use as a catalyst and oxidizing or nitrating agent.
NOAA	National Oceanic and Atmospheric Administration
NOC	Notice of Construction
Noise	Unwanted sound that interferes with the normal activities of humans and the natural

	environment.
Nonattainment	An area which does not meet air quality standards set by the Clean Air Act for specified localities and time periods. Locations where pollutant concentrations are greater than the AAQS.
NO_x	Oxides of nitrogen
NPDES	National Pollution Discharge Elimination System. Federal water quality program administered by the State agency responsible for water quality.
NRHP	National Register of Historic Places
NRP	National Radiological Protection Board
NSPS	New Source Performance Standards
NSR	New Source Review
NWP	Northwest Pipeline Corporation
NWS	Northwest Wildlife Surveys
O_3	Ozone
OAPCA	Olympic Air Pollution Control Authority
OAR	Oregon Administrative Record
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
ONHP	Oregon Natural Heritage Program
Open Space Area	Region that has wetlands, steep slopes, floodplains, parks, recreation facilities, and public preserves.
ORAU	Oak Ridge Associated Universities
OSHA	Occupational Safety and Health Administration
OSP	Oregon State Police

OWL	Olympic-Wallowa Lineament
Palustrine	General freshwater wetlands classification associated with partially saturated areas not part of a surface water system.
Particulate matter	Fine solid particles that remain individually dispersed in stack emissions.
PCB	Polychlorinated biphenyl
PGA	Peak ground accelerations
PGE	Portland General Electric
PGT	Pacific Gas Transmission
Physiographic province	A region of similar structure and climate that has a unified geomorphic (pertaining to surface form) history.
PID	Planned Industrial District
Pleistocene	Period of geologic time extending from about 2 million years ago.
PM	Particulate matter
PM_{10}	Particulate matter with aerodynamic diameter of less than 10 microns
Port	Port of Umatilla-City of Hermiston
ppbv	Parts per billion by volume
ppm	parts per million
ppmdv	parts per million by dry volume
ppmv	Parts per million by volume
PSD	Prevention of Significant Deterioration
Quaternary	Period of geologic time approximately 2 million years ago.
RCP	Resource Contingency Program
RCRA	Resource Conservation and Recovery Act. Federal regulations addressing management of

	hazardous waste. In Washington State these are implemented through the adopted state regulations, Washington State Dangerous Waste Regulations (WAC 177-353).
ROD	Record of Decision. A document prepared in accordance with the requirements of 40 CFR 1505.2, that provides a concise public record of the agency's decision on a proposed action for which an EIS was prepared, and identifies alternatives considered before reaching the decision, the environmentally preferred alternative(s), factors balanced by the agency making the decision, and whether all practical means to avoid or minimize environmental harm have been adopted and if not, why not.
ROW	Right-of-way. An easement for a certain purpose over the land of another, such as a strip of land used for a transmission line, roadway, or pipeline.
RM	River mile
Runoff	Water from precipitation or irrigation that flows over the ground surface and returns to streams or other water bodies. It can collect pollutants from the air or land and carry them to the receiving waters.
Rural Area	Region where a rural lifestyle is to be maintained by directing urban levels of growth and associated public services into Growth Areas.
RV	Recreational vehicle
SARA	Superfund Amendment and Reauthorization Act
SCA	Site Certificate Application
SCS	Soil Conservation Service
SCR	Selective catalytic reduction. An air pollution control technology that reduces NO_x to nitrogen and water when combined with a reducing agent, such as ammonia.
Sensitive wildlife	Refers to all wildlife species that are protected by state and/or Federal regulations administered by the USFWs and WDFW.
SEPA	State Environmental Policy Act
Shrub-Steppe	A community of low drought-tolerant shrubs and bunch grasses
SHPO	State Historic Preservation Office
SIL	Shrub-steppe. A community of low drought-tolerant shrubs and bunch grasses. Significant impact level.
SIP	State Implementation Plan
SMA	Shoreline Management Act of 1971
SMMP	Shoreline Management Master Program
Smog	Photochemical ozone

SMP	Shoreline Master Program
SO_2	The chemical formula for sulfur dioxide. Sulfur dioxide can be found in either a gaseous or liquid state. It is commonly used in the manufacture of sulfuric acid.
SO_4	Sulfate
SO_4^{2-}	The chemical formula for sulfate with two additional electrons.
SPCC	Spill Prevention, Control, and Containment
SR	State Route
Surface water	Any water, temporary or permanent, which is above the ground surface, observable with the unaided eye.
SWAPCA	Southwest Air Pollution Control Authority
TAP	Toxic air pollutant
TDS	Total dissolved solids
Threatened species	Those species officially designated by the U.S. Government that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.
TMDL	Total Maximum Daily Load
Topography	Relief features or surface configuration of an area.
TPY	Tons per year
Transmission	The act or process of transporting electrical energy in bulk from a source or sources of supply to other principal parts of a system or to other utility systems.
Transmission line	The structures, insulators, conductors, and other equipment used to transfer electrical power from one point to another.
TSCA	Toxic Substances Control Act
TSD	Treatment, storage, and disposal
TSP	Total suspended particulate matter
UBC	Uniform Building Code. A code published by the International Conference of Building Officials. Covers the fire, life, and structural safety aspects of all building and related structures.

UECA	Umatilla Electric Cooperative Association
UFC	Uniform Fire Code
mg/m^3	Micrograms per cubic meter
USC	United States Code
USCA	United States Code Annotated
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	Volatile organic compound
Wastewater	Water that carries wasted from buildings, institutions, and industrial establishments.
Wetlands	An area where the soil experiences anaerobic conditions because of the inundation of water during a portion of any given year. Indicators of a wetland include types of plants, solid characteristics, and hydrology of the area.
WPCF	Water Pollution Control Facilities