Resource Contingency Program — Oregon

Final Environmental Impact Statement
Hermiston Power Project

DOE/EIS-0230
September 1995

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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.
BOD	Biological oxygen demand
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.
HRSG	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
kV	Kilovolt. One thousand volts
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 (CH_4) 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
NRPB	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
$\mu g/m^3$	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

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.

Western 230-kV Alternative

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.

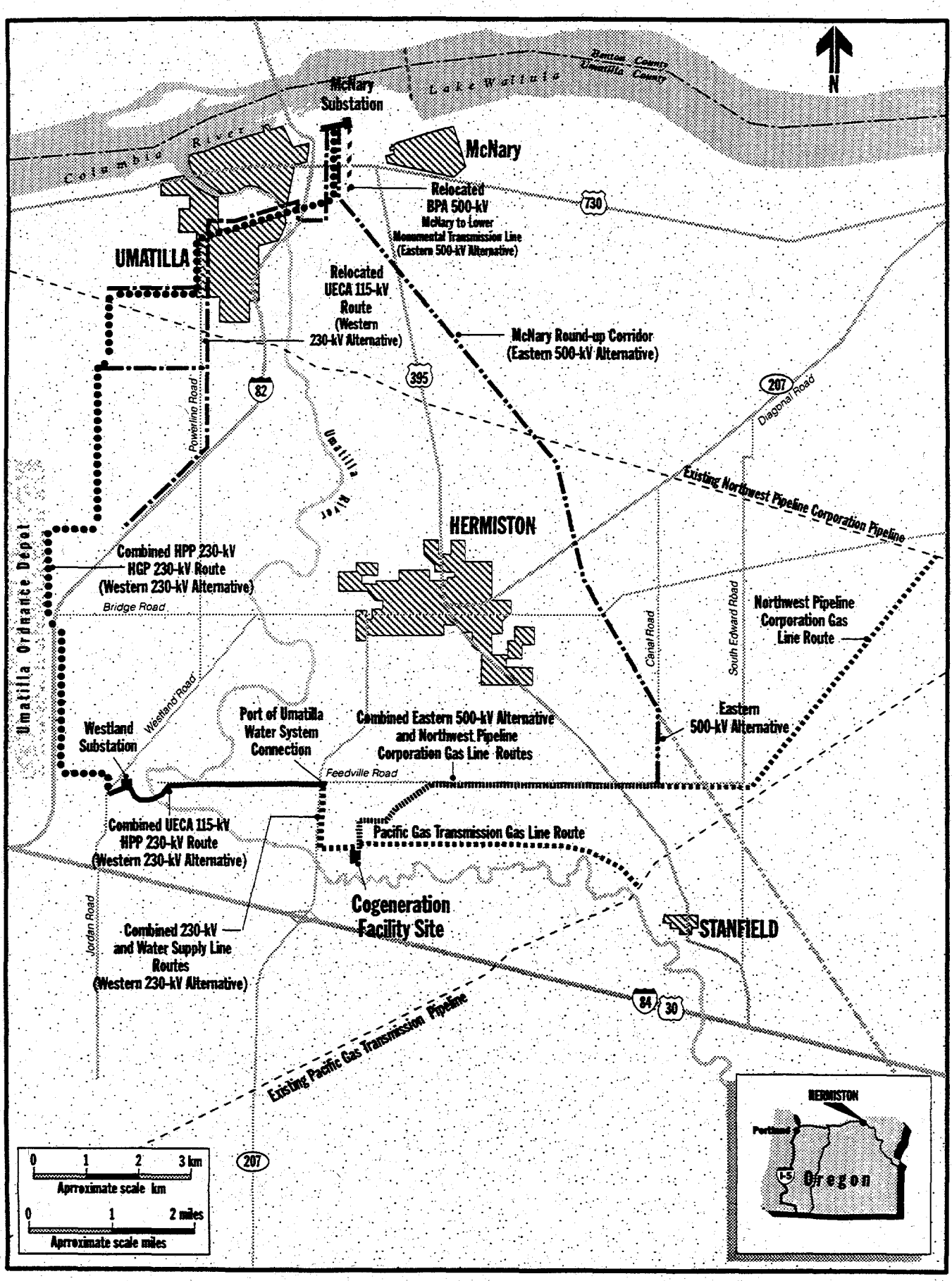


Figure S-1 Project Vicinity Map

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

Resource Area/Potential Impacts	*Degree of Impact*		*Mitigation Measures*
	Project Alone	*Cumulative*	
Geologic Hazards (during operation) • Landslides/Pipeline rupture • Earthquakes/building damage • Volcanic activity/Ashfall	Low	Low	• Conservative seismic design criteria • Design to minimize damage from ground liquefaction • Avoid construction of pipelines on steep slopes
Soils (during construction) • Erosion • Compaction (loss of fertility) • Loss of prime farmland	Low	Low	• Erosion and Sediment Control Plan (ESCP) including: sediment traps; silt fences; diversion structures; revegetation. • Segregation and stockpiling of agricultural soil, and replacement in proper sequence.
Flood Plains (during construction) • Temporary disruption of floodplain functions	Low	Low	• Site specific water body crossing plans designed to minimize impacts.
Water Resources (during operation) Quantity • Depleted surface water—Columbia River	Low	Low	• None required
Quality • Degraded ground and surface water quality	Low	Low	• Storage of effluent during freezing soil conditions to minimize nitrogen build-up in groundwater or effluent runoff • Spill containment measures (SPCC plan) • ESCP

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

Resource Area/Potential Impacts	*Degree of Impact*		*Mitigation Measures*
	Project Alone	*Cumulative*	
Air Quality (during construction and operation) • Emissions of criteria air pollutants such as nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), particulate matter (PM_{10}), sulfur dioxide (SO_2). • Emissions of toxic pollutants such as ammonia, benzene, formaldehyde, lead • Health problems associated with above pollutants • Decreased visibility in scenic areas • Deposition of sulfur and nitrogen compounds • Local fogging and icing from cooling tower plumes • Fugitive dust during construction	Low	Low	• Use of Best Available Control Technology (BACT) to control levels of pollutant emissions. Under BACT, the "most stringent control technology" must be applied to the control of each pollutant, unless it can be demonstrated to EPA that less stringent measures will provide required control • Water tank trucks will spray to control dust, as required.
Noise (during construction and operation) • Disturbance from construction activities • Disturbance from operational noise to nearby residences	Low	Low	• Mufflers on construction equipment • No construction on Sundays, legal holidays, or between 10 pm and 6 am • Cogeneration facility construction will use noise silencers and sound absorbing material • Major noise sources will be separated and enclosed in acoustical buildings • Noise barriers will be constructed in the cooling towers

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

Resource Area/Potential Impacts	*Degree of Impact*		*Mitigation Measures*
	Project Alone	*Cumulative*	
Vegetation/Wetlands (during construction and operation) • Temporary disturbance to various upland non-forested plant communities • Permanent loss of cropland at cogeneration facility site • Temporary disturbance to wetlands and loss of function until restored after construction	Low	Low	• Avoidance of wetlands where possible • ESCP (see Soils) • Revegetation with native species
Wildlife and Fisheries (during construction and operation) • Temporary disturbance of cropland, shrub, and grass habitat • Temporary disturbance to wildlife from construction activities • Permanent loss of habitat from transmission poles/towers	Low	Low	• Retain native vegetation as much as possible during construction • Replant disturbed habitat soon after construction • Avoid waterway construction between June 15 and September 30 • Prevent construction equipment from entering streams • ESCP (see Soils)
Land Use (during construction) • Temporary disruption to existing land uses • Inconvenience to local residents and travelers • Permanent loss of prime farmland at cogeneration facility site	Low	Low	• Employ practices that will minimize noise, dust, and traffic in adjacent neighborhoods

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

Resource Area/Potential Impacts	*Degree of Impact*		*Mitigation Measures*
	Project Alone	*Cumulative*	
Cultural Resources (during construction) • Disturbance of prehistoric and historic archaeological sites • Temporary alteration of historic canals by gas pipelines	Low	None	• Restore canal walls to original condition • Avoid placement of transmission poles or towers on canal banks • Conduct specific site surveys at crossings of Umatilla River • Halt construction if previously unrecorded sites are found, and consult with SHPO • Provide information to contractors regarding discovery procedures
Socioeconomics and Public Services (during *construction and operation*) • Increased demand for temporary and permanent housing • Temporary and permanent employment opportunities would increase in project vicinity • Wages and taxes paid by the project would benefit local and regional economy • Increased demand for local services • Traffic on local roadways would increase	Low (Beneficial)	Moderate	• Establish a housing clearing house • Coordinated worker traffic patterns • Heavy equipment deliveries coordinated to road restrictions • Heavy equipment delivered by rail
Recreation (during construction) • Competition for campsites at private and public campgrounds in the project vicinity	None	None	• None
Public Health and Safety (during operation) • Negative health effects from exposure to accidental releases of fuels and chemicals stored at cogeneration facility site • Accumulation of solid and moderate risk wastes from project operation • Electric shock	Low	Low	• Spill Prevention Control, and Countermeasures (SPCC) plan • Reuse and recycle plan • Hazardous Materials Management Plan • Storage tanks designed to contain any spills • Storm Water Pollution Prevention Plan (SWPP)

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

Resource Area/Potential Impacts	*Degree of Impact*		*Mitigation Measures*
	Project Alone	*Cumulative*	
Visual Quality (during operation)			
• Visual intrusion of buildings, cooling towers, and emission stacks to residents and travelers • Plumes from cooling towers and emission stacks • Visual disturbance from pipeline ROWs	Low	Low	• Painting emission stacks in a matte finish to prevent glare • Shrub/tree screening of buildings • Tree/shrub plantings along western and southern perimeter of cogeneration facility site • Limited and directional outdoor lighting • Reseeding construction ROWs soon after completion
• Visual Intrusion of new electrical transmission lines, towers, and/or poles			
	Eastern 500-kV Alternative		
	Moderate	Moderate	
	Western 230-kV Alternative		
	Low	Low	

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.

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 (NOX or VOC) in non-attainment 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.

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

Sponsor	Location	Type of Project	Min. aMW
Basin Electric	Beula, ND	Coal	80
CA Energy	Sparks, NV	Geothermal	29.8
Chehalis Power	Chehalis, WA	Cogeneration	223
Coburg Power	Coburg, OR	Cogeneration	118.4
Community Energy	Twin Falls, ID	Cogeneration	42.8
Energy Initiatives	Portland, OR	Cogeneration	221
Enserch	Kalama, WA	Cogeneration	209
Enserch	Tacoma, WA	Cogeneration	209
Hanford Generating	Hanford, WA	Cogeneration	213
Ida-West Energy	Hermiston, OR	Cogeneration	141
Ida-West Energy	Heyburn, ID	Cogeneration	41.4
PacifiCorp	N/A	System Sale	Neg.
SDS Lumber	Bingen, WA	Cogeneration	31
SEI	Bremerton, WA	Cogeneration	111
Sithe Energies	Tacoma, WA	Cogeneration	100
Supply System	Satsop, WA	CT	160
Tenaska Power	Malin, OR	CT	200
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
U.S. Generating	Tacoma, WA	Cogeneration	46.5
United Cogeneration	Seatac, WA	Cogeneration	41.1
Unocal	Hope, B.C. (Canada)	CT	100
Willpenn Power	Tacoma, WA	Cogeneration	144
Willpenn Power	Pasco, WA	CT	199.5
		Total aMW:	2784.78

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 Each*	*Option Period*
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.

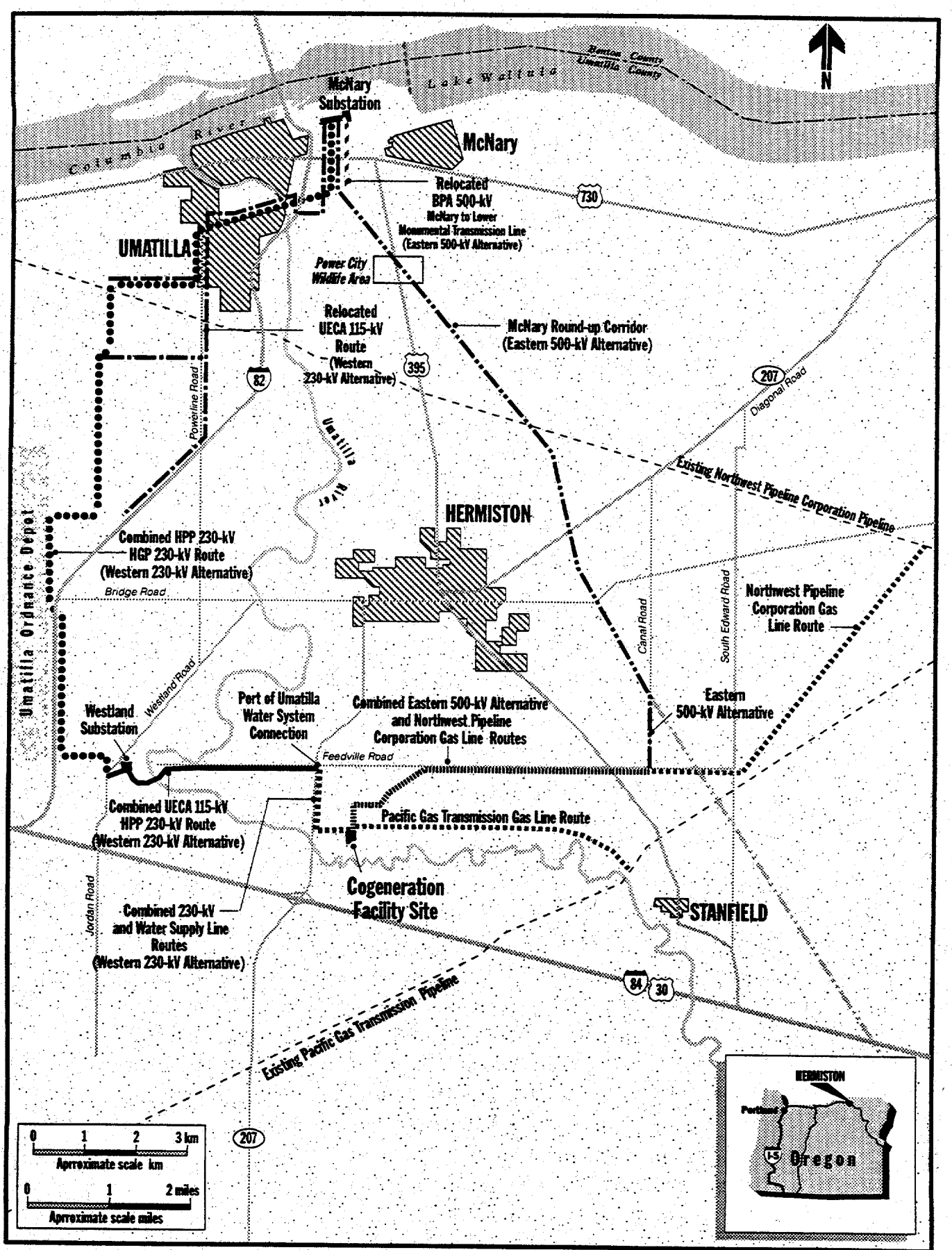


Figure 2-1 Project Location and Components

- 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

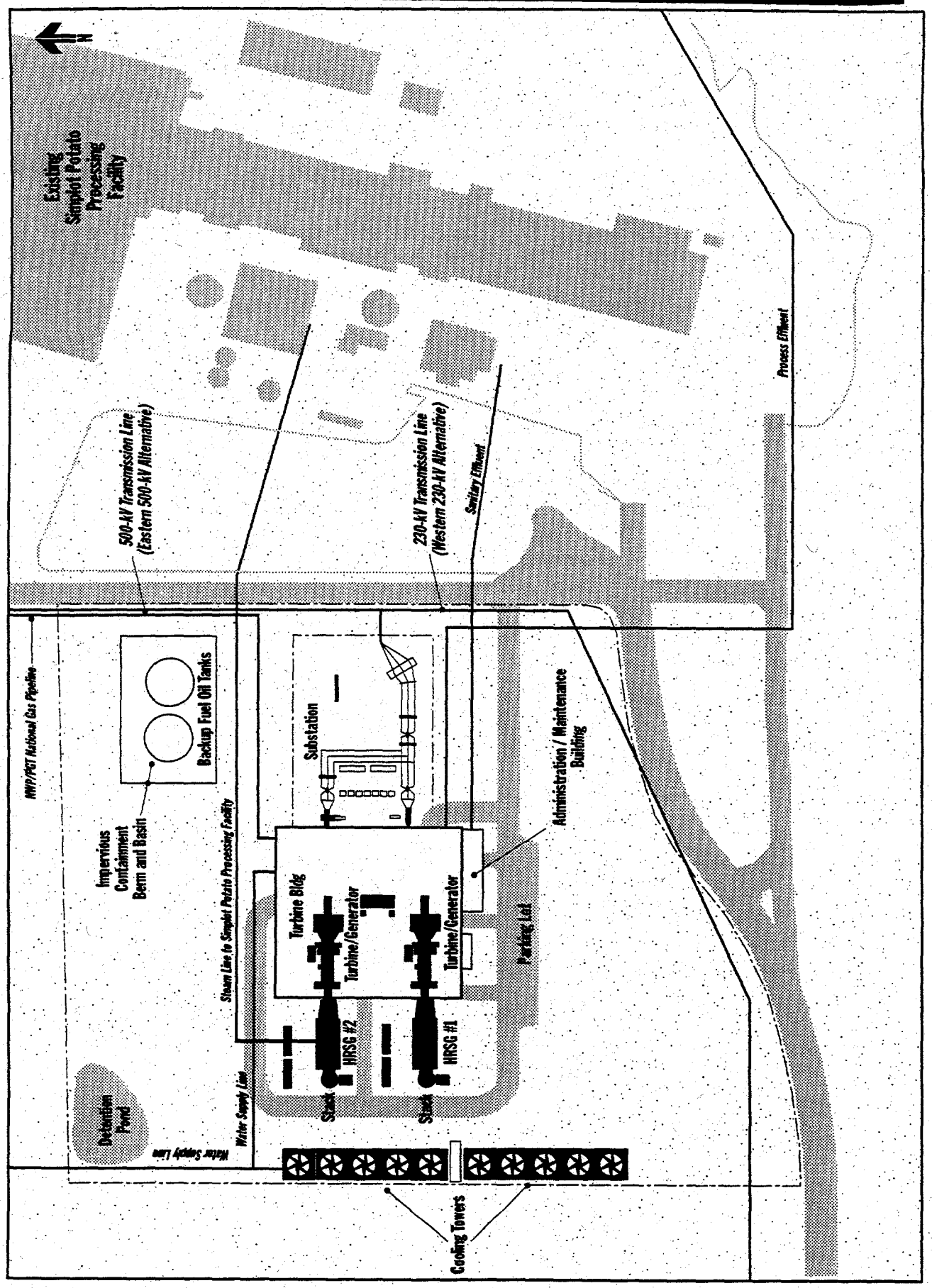


Figure 2-2 Cogeneration Facility Site Plan

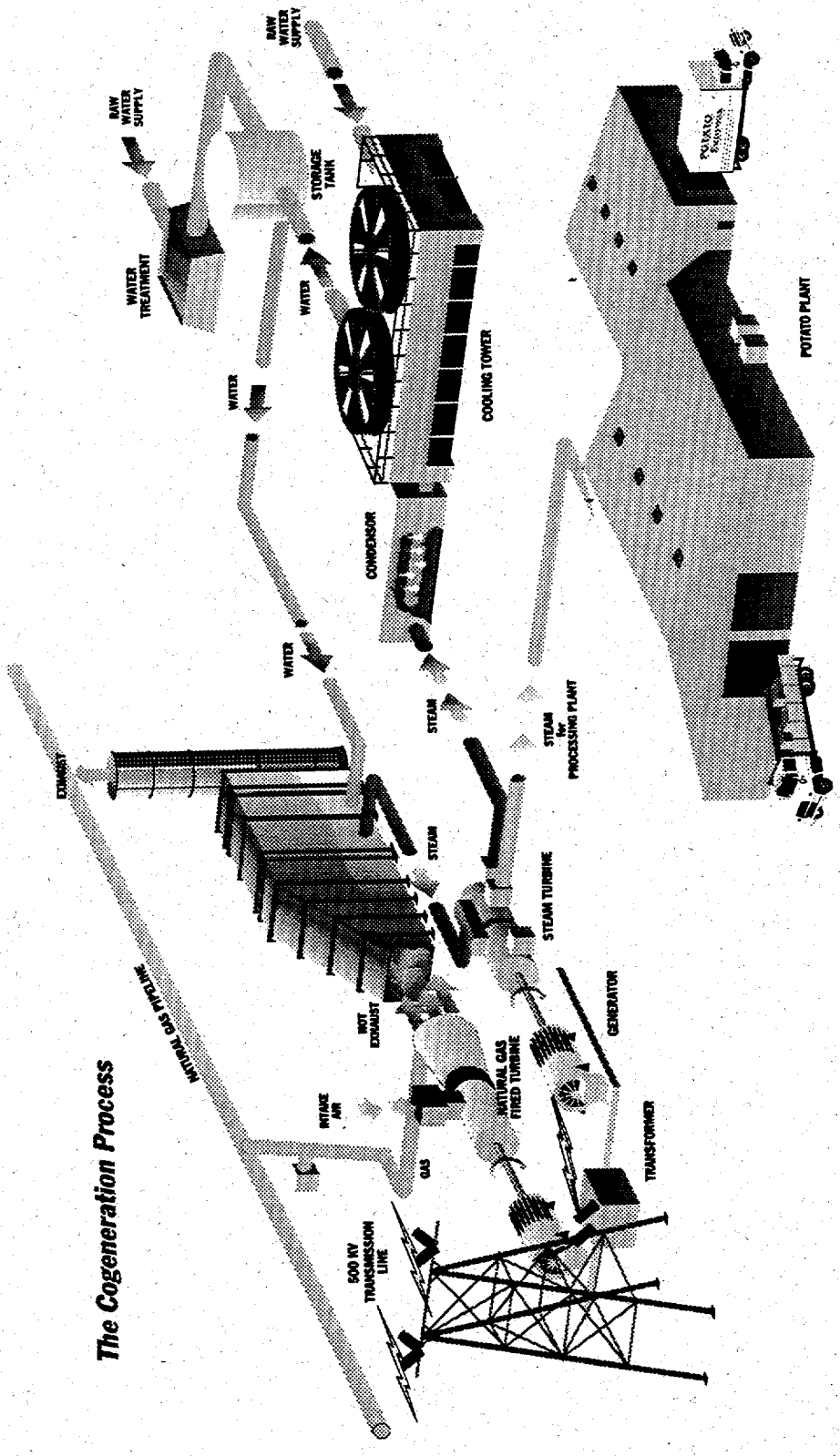


Figure 2-3 Cogeneration Flow Diar

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.

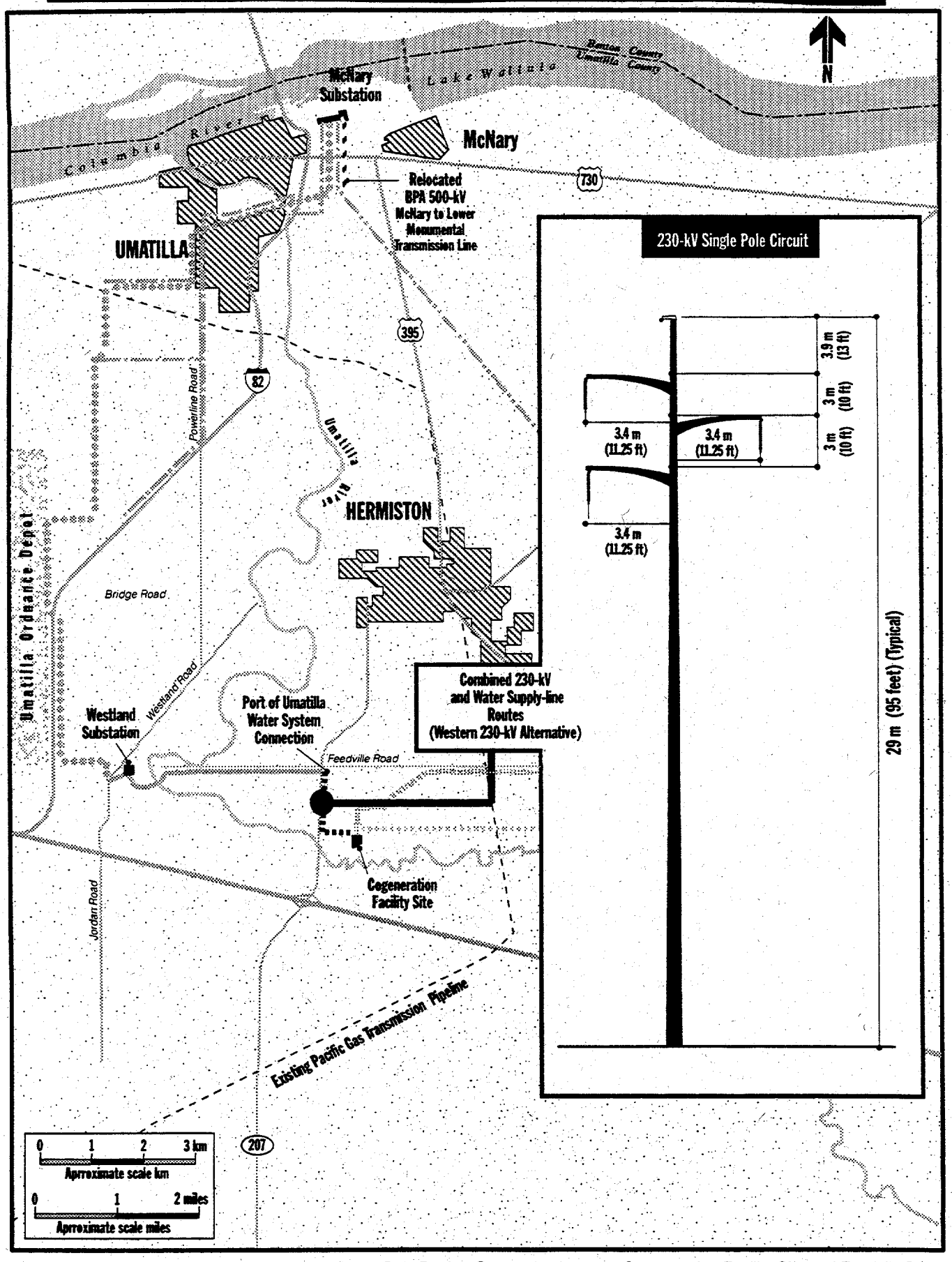


Figure 2-4 Proposed Transmission Line Pole Design-Connection between Cogeneration Facility Site and Feedvile Road

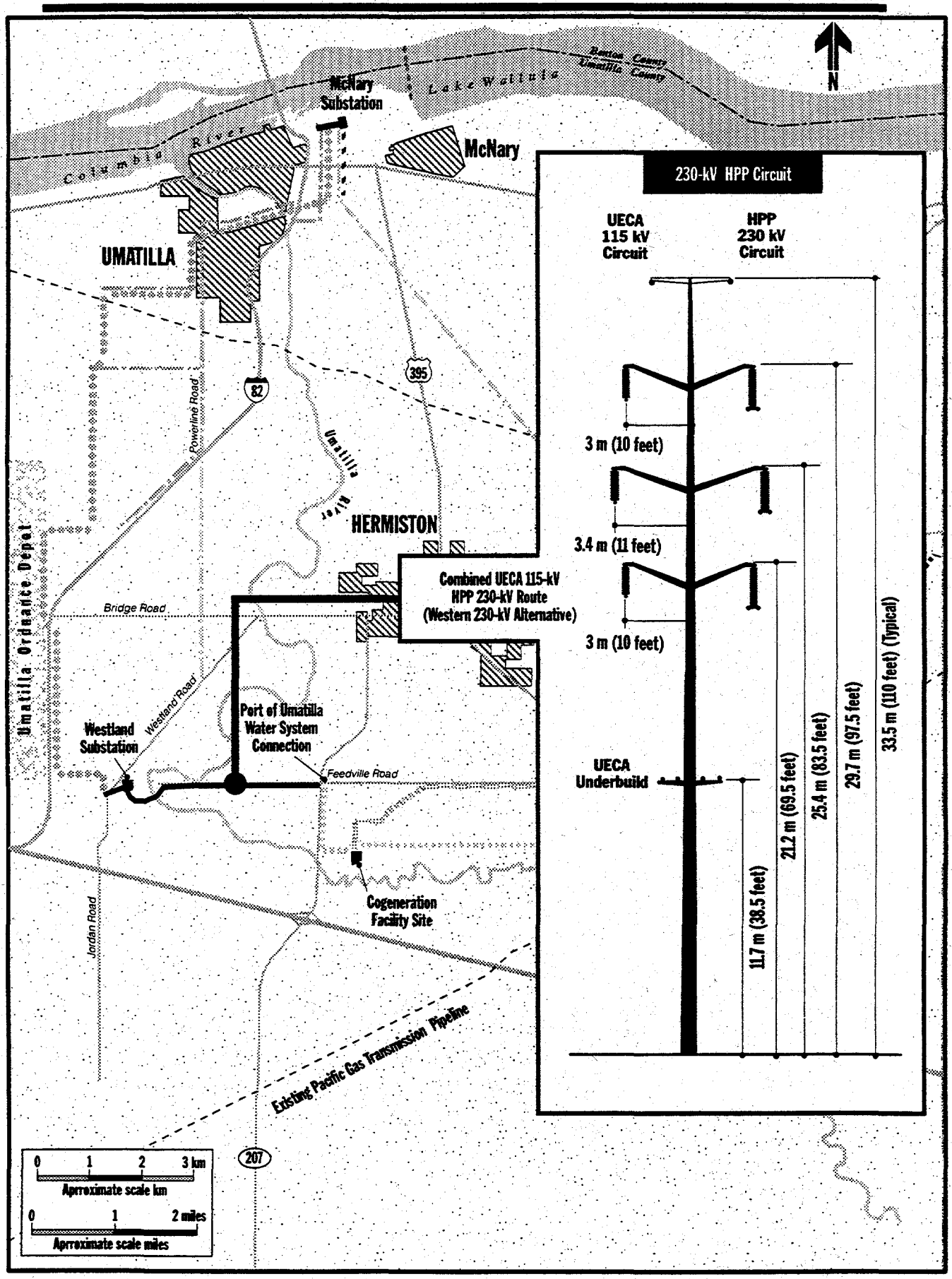


Figure 2-5 Proposed Transmission Line Pole Design-Western 230-kV Alternative (Westland Substation East on Feedville Road)

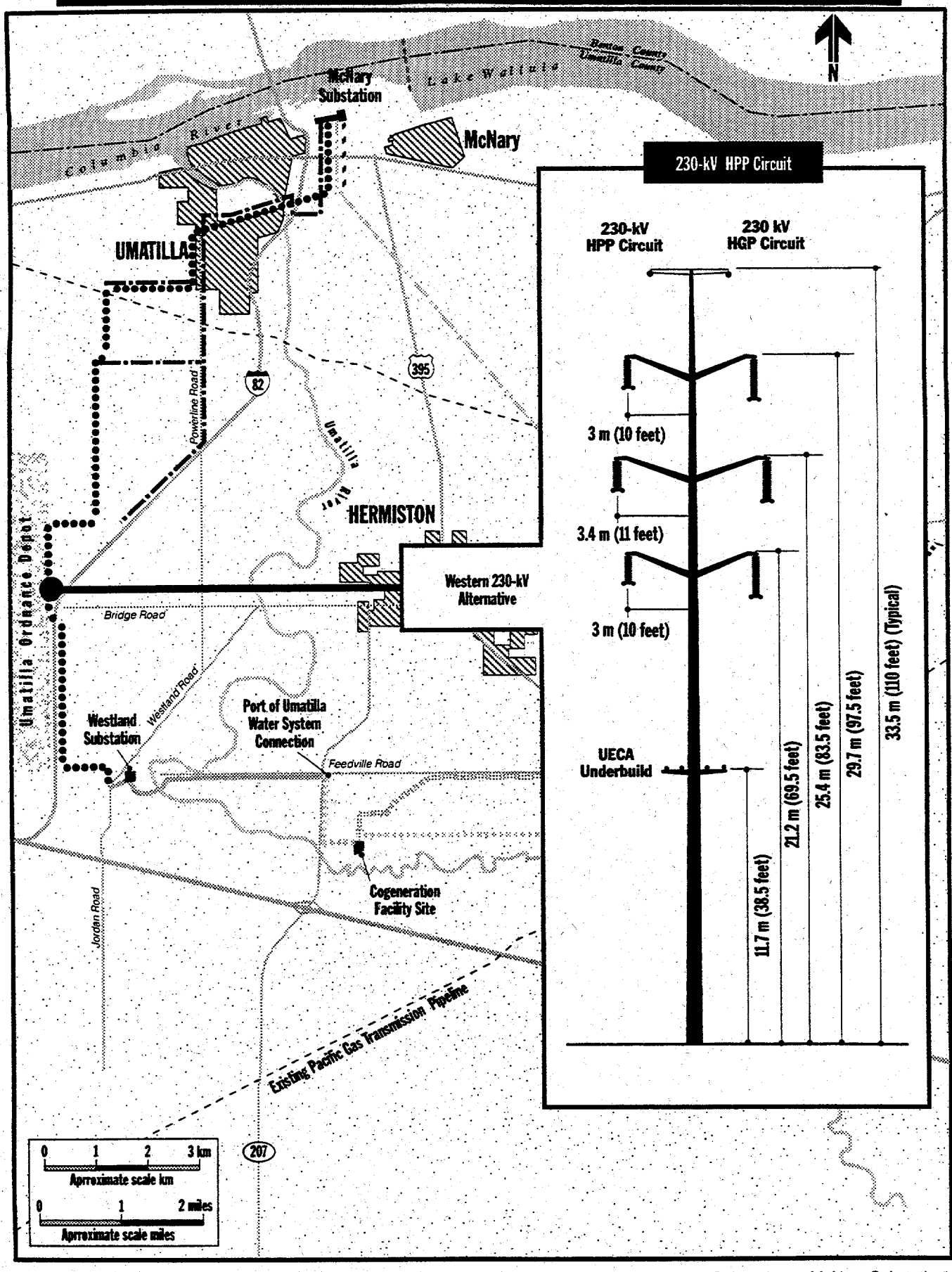


Figure 2-6 Proposed Transmission Line Pole Design-Western 230-kV Alternative (Westland Substation to McNary Substation)

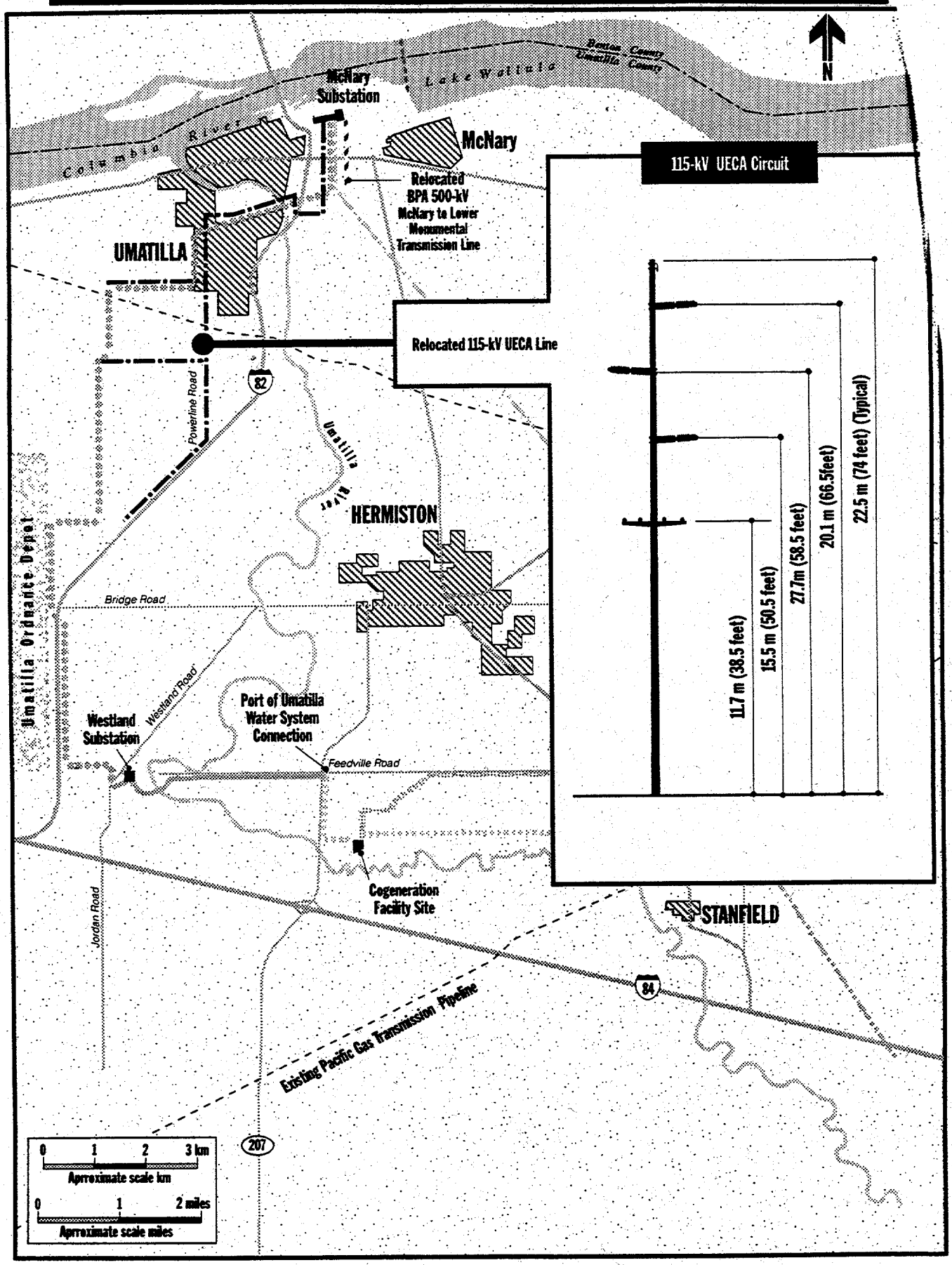


Figure 2-7 Proposed Transmission Line Pole Design-Western 230-kV Alternative (Relocated 115-kV UECA Line)

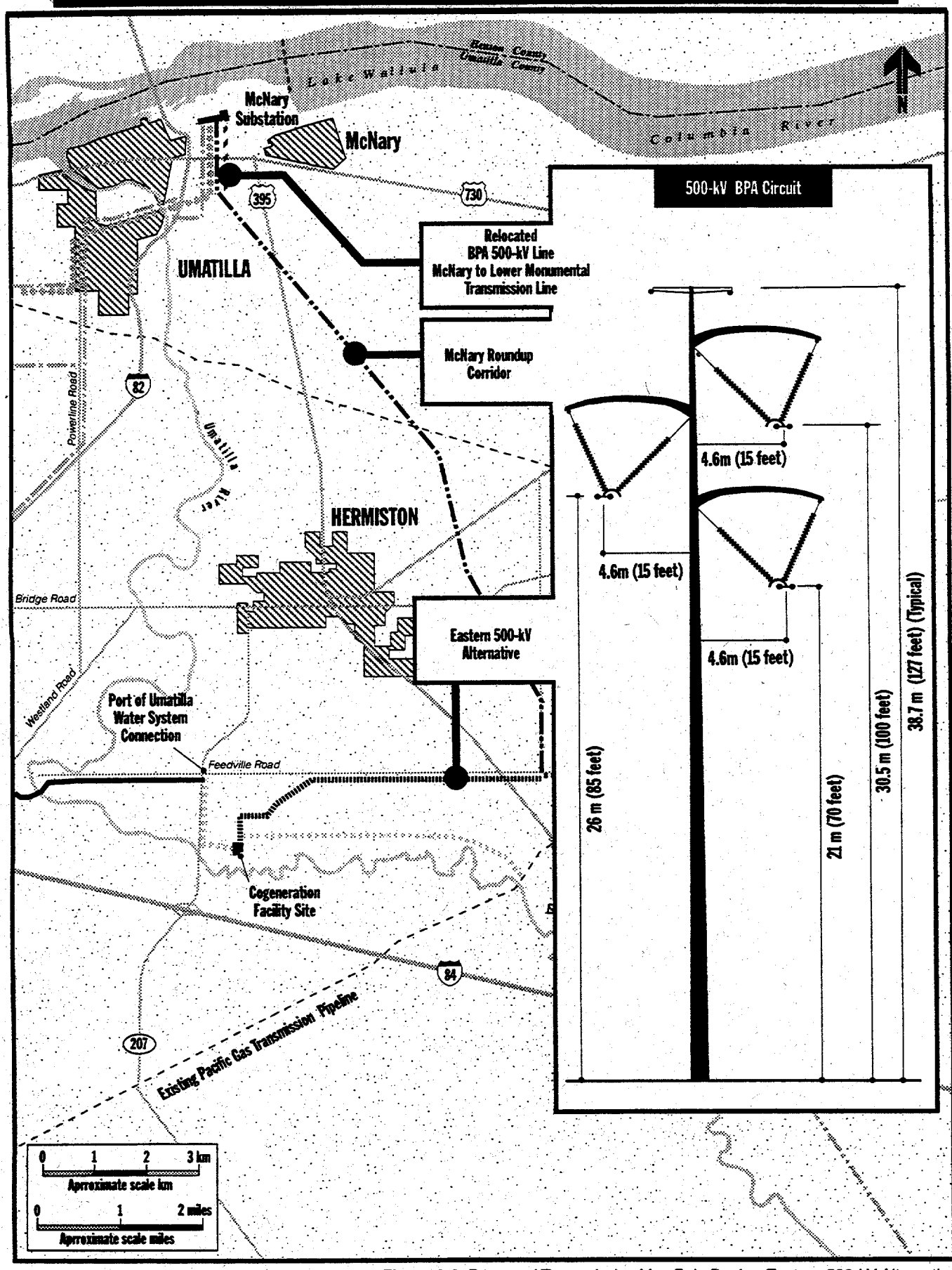


Figure 2-8 Proposed Transmission Line Pole Design-Eastern 500-kV Alternative

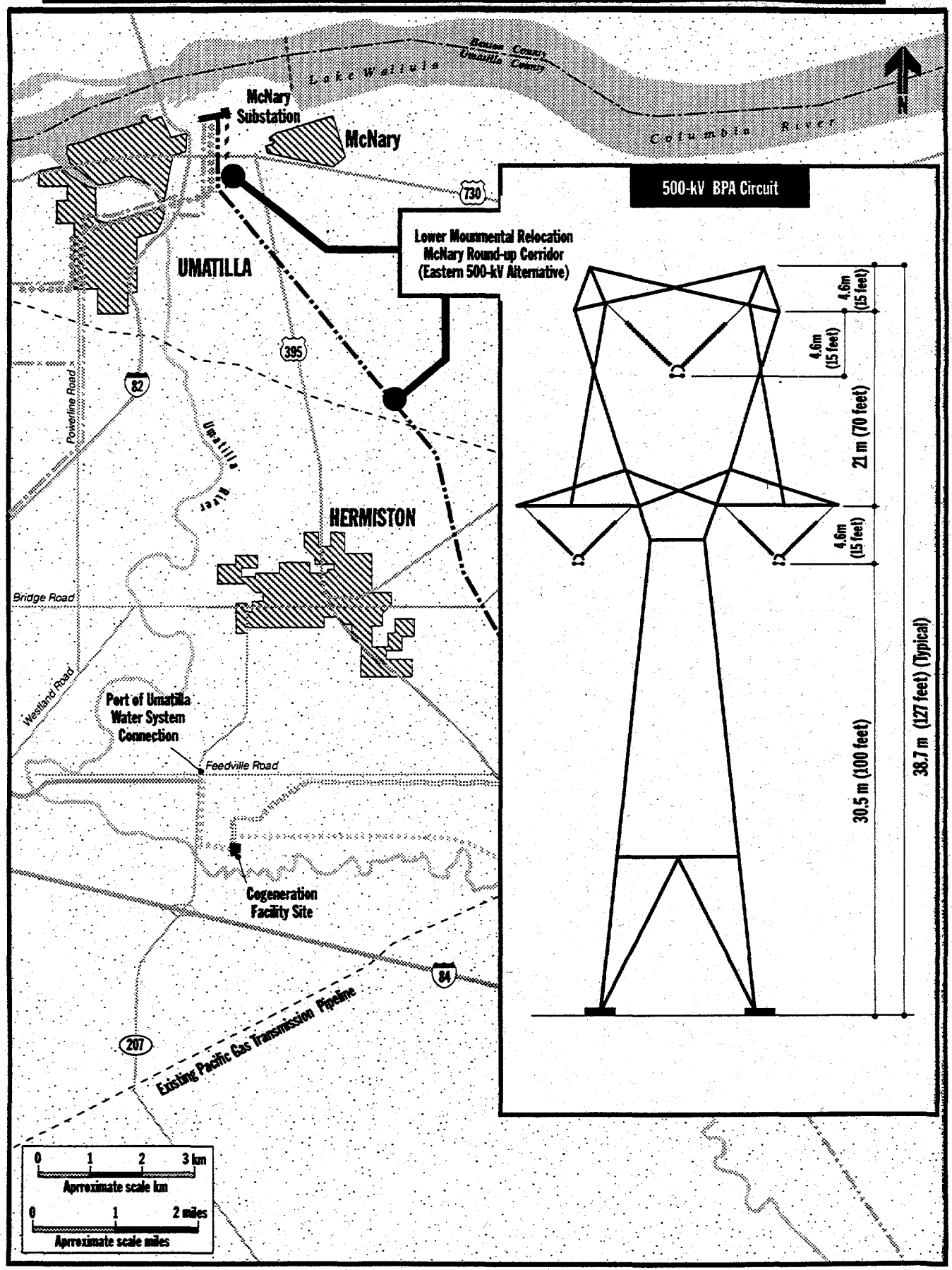


Figure 2-9 Optional Tower Configuration - Eastern 500-kV Alternative (McNary Corridor and Lower Monumental Relocation Only)

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)

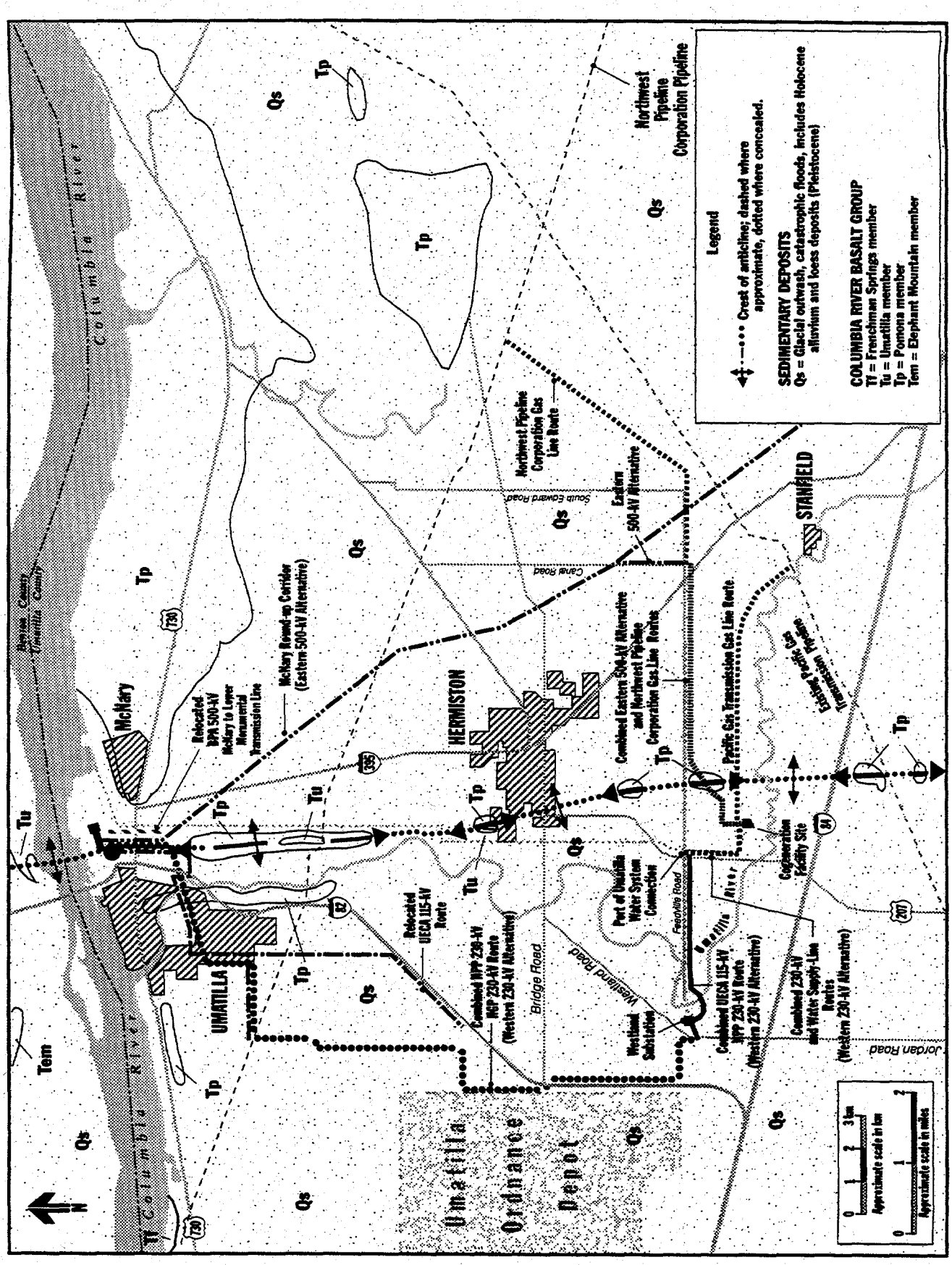
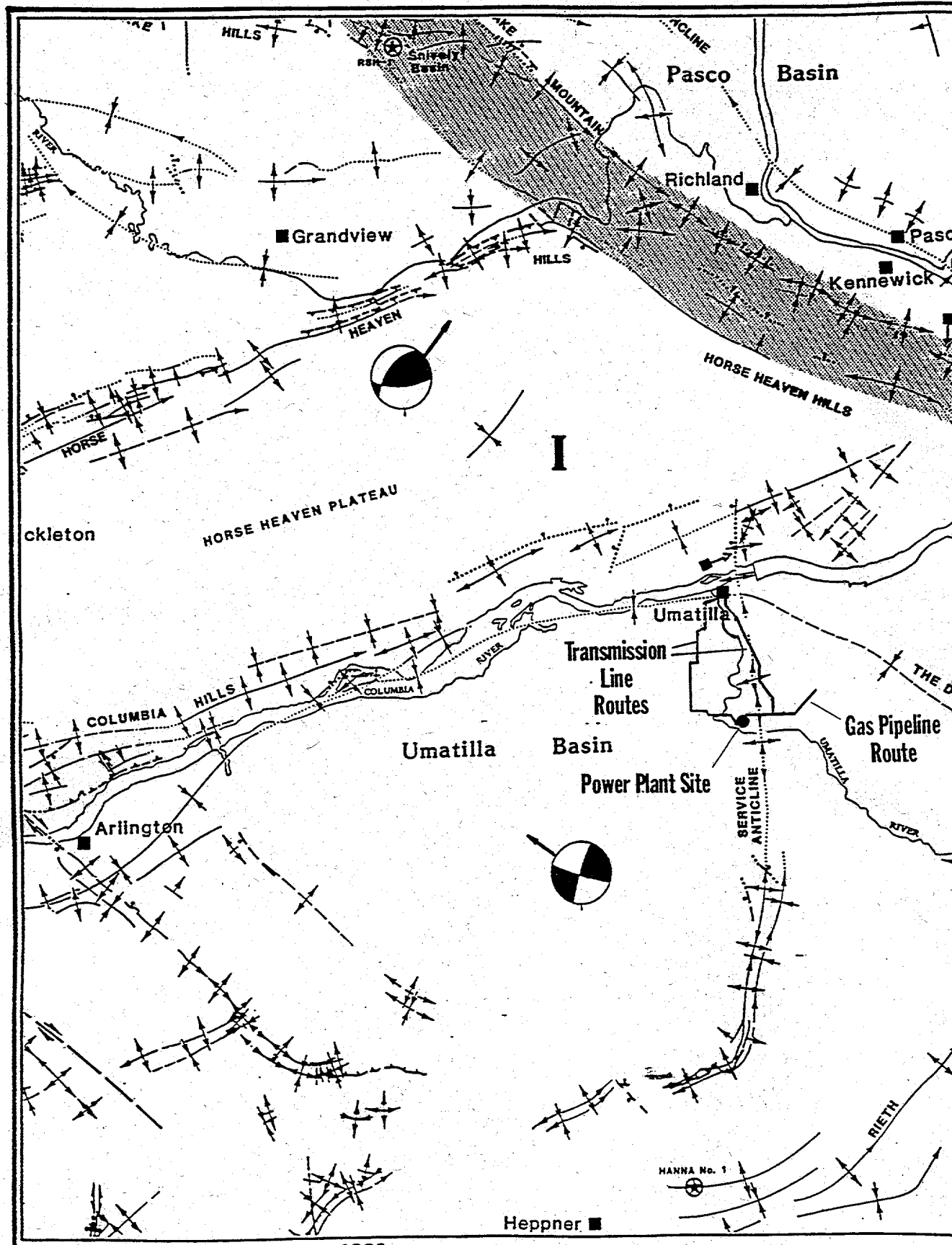
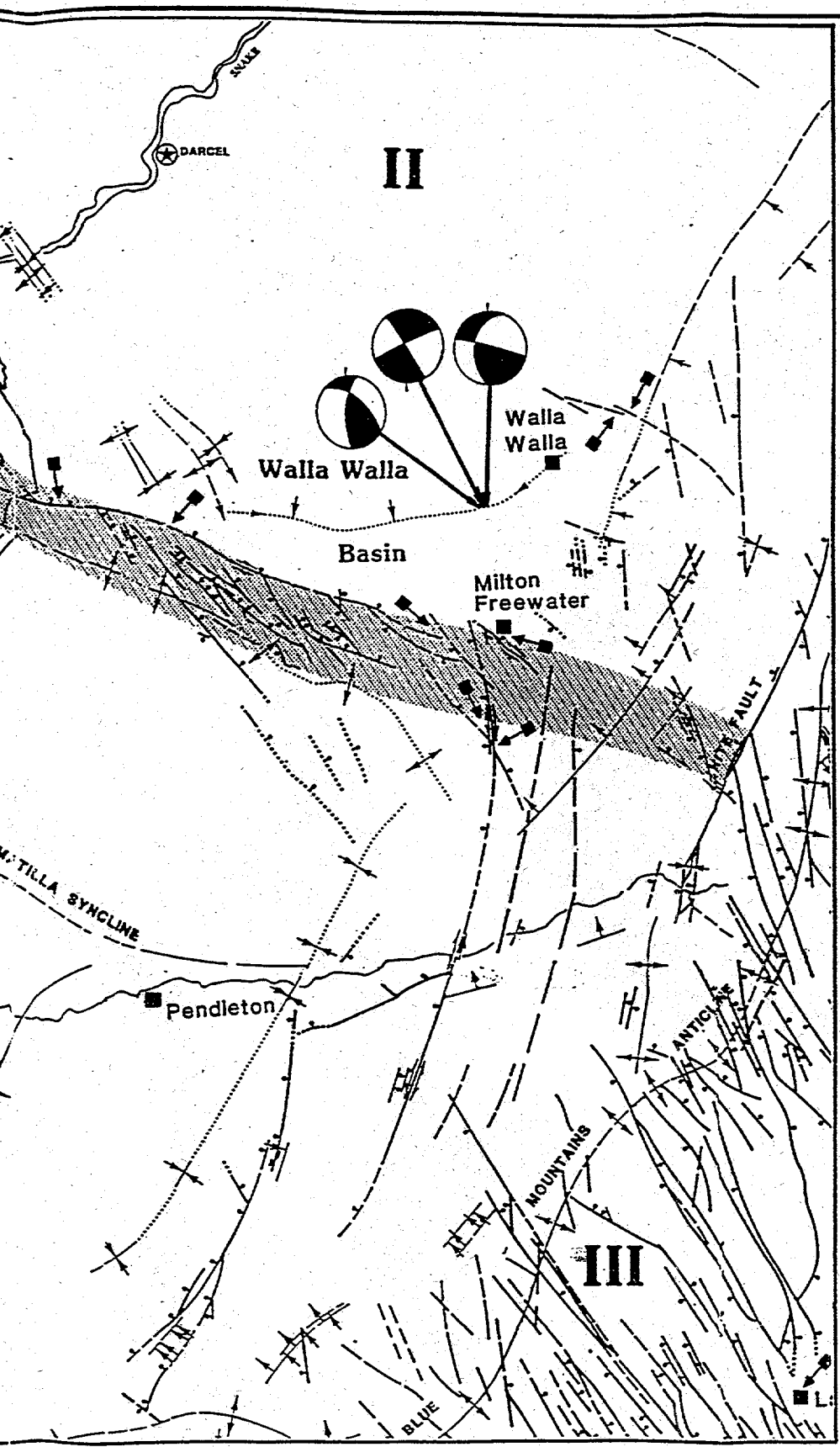


Figure 3.1-1 Geologic Map



modified from Reidel and Hooper, 1989



EXPLANATION

- ANTICLINE
- SYNCLINE
- MONOCLINE - Abrupt increase in dip in direction of arrows
- MONOCLINE - Abrupt decrease in dip in direction of arrows
- FAULT - Bar and ball on downthrown side
- STRIKE-SLIP FAULT - Arrows show direction of relative horizontal movement
- Reported Quaternary Age Displacement
- Selected earthquake single-event focal mechanisms (>3.2 coda-length magnitude)
- RATTLESNAKE-WALLULA ALIGNMENT AND OLYMPIC-WALLOWA LINEAMENT (OWL)

STRUCTURAL SUBPROVINCES

- I YAKIMA FOLD BELT SUBPROVINCE
- II PALOUSE SLOPE SUBPROVINCE
- III BLUE MOUNTAINS SUBPROVINCE

N

10 miles

HERMISTON PROJECT

Figure 3.1-2
Structural and Tectonic Map

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.

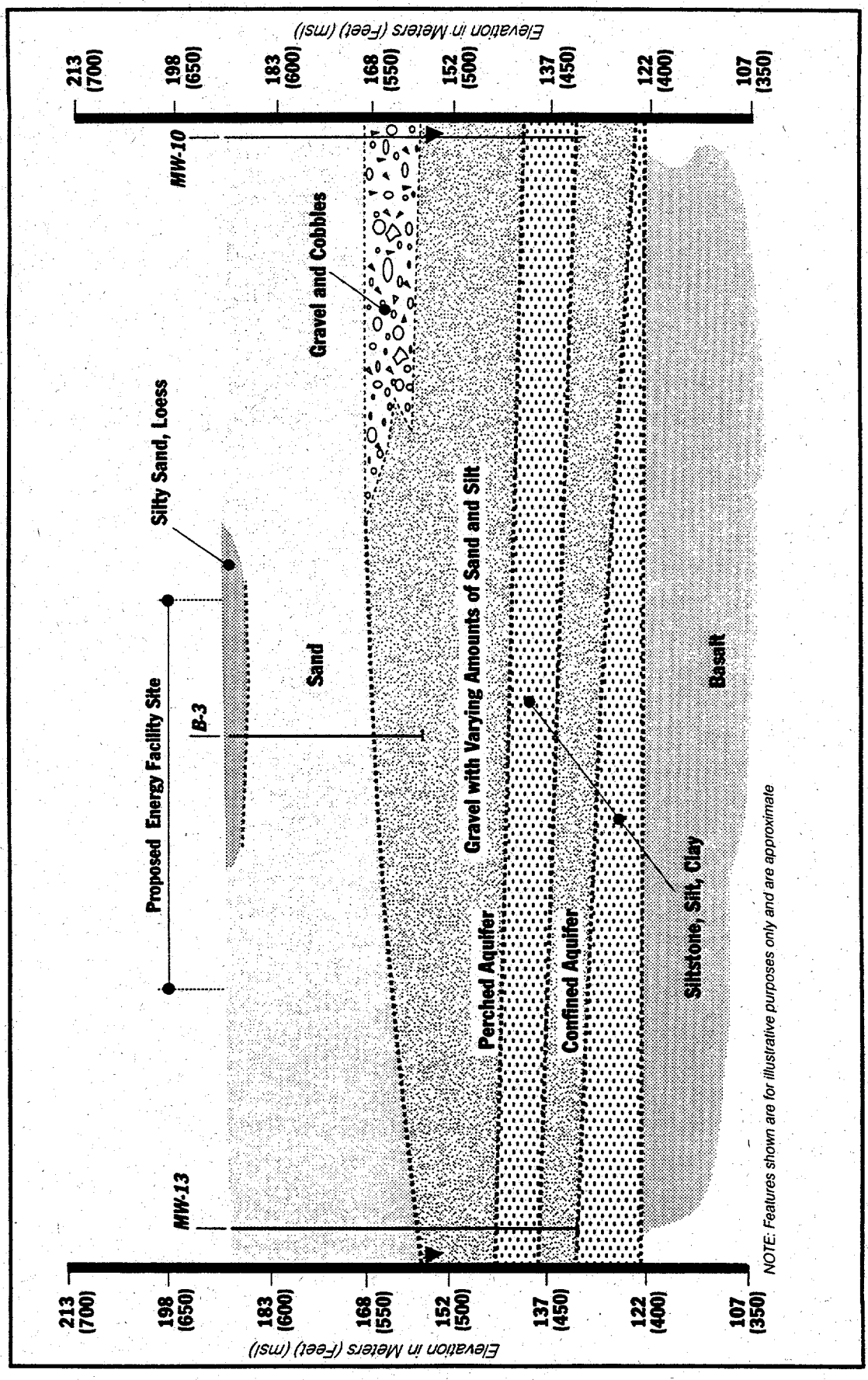


Figure 3.1-3 Geologic Cross Section of Cogeneration Facility Site

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.

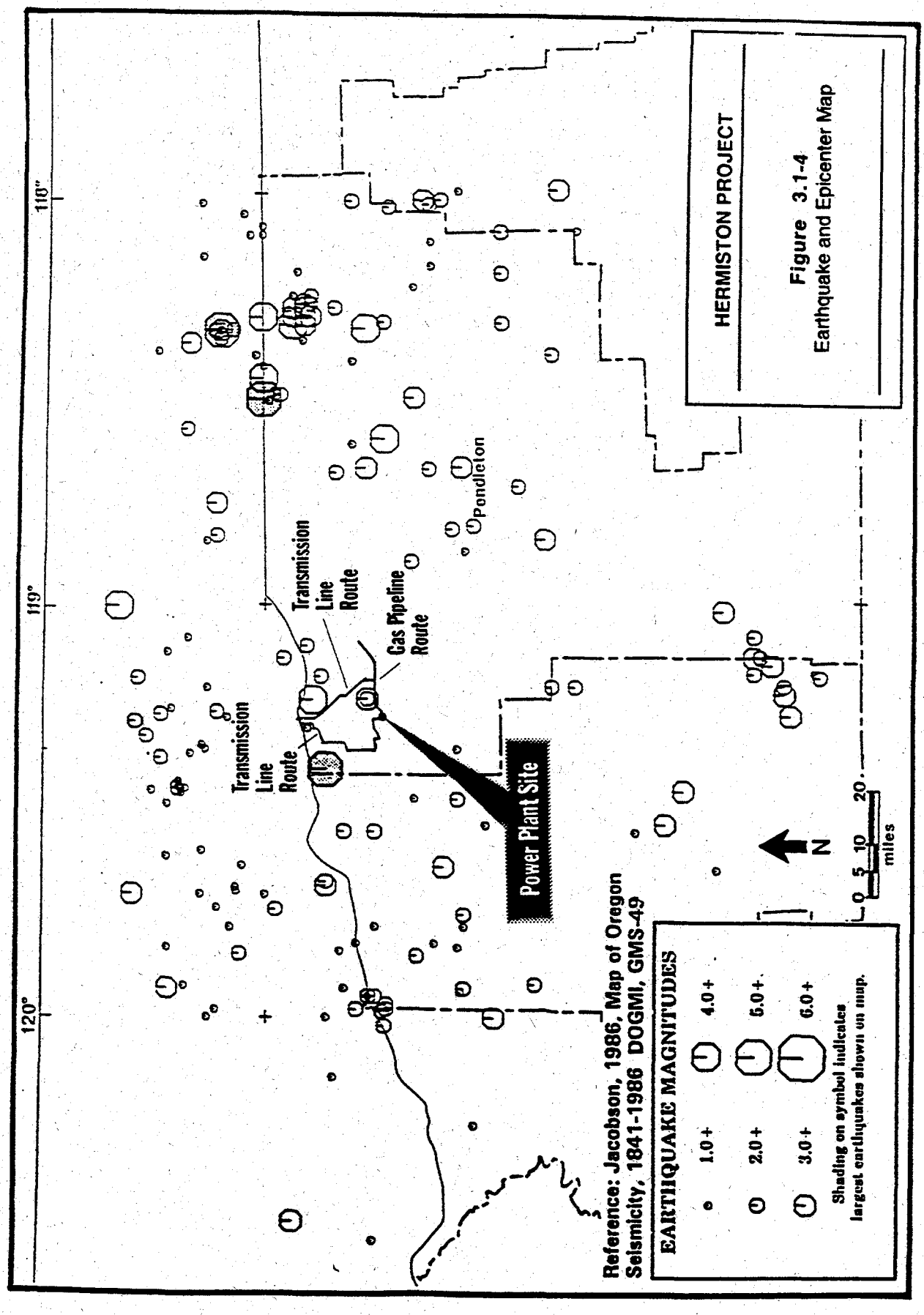
Erosion

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).


HERMISTON PROJECT
Figure 3.1-4
Earthquake and Epicenter Map
118°
119°
120°
Pendleton
Transmission Line Route
Gas Pipeline Route
Transmission Line Route
Power Plant Site
N
0 5 10 20
miles
Reference: Jacobson, 1986, Map of Oregon Seismicity, 1841-1986 DOGMI, GMS-49
EARTHQUAKE MAGNITUDES
1.0+
2.0+
3.0+
4.0+
5.0+
6.0+
Shading on symbol indicates largest earthquakes shown on map.

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 [miles])*	*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

Table 3.1-2. Soils Information by Project Component

	Ha (acres)	Prime Farmland	Erosion	
			Wind	Water
Cogeneration Facility Site				
Adkins fine sandy loam (0-5% slope)	2.2 (5.50)	Yes	Moderate	
Quincy loamy fine sand	4.7 (11.50)	No	High	
Subtotal	6.9 (17.00)			
Waterline Route				
Quincy loamy fine sand	2.99 (7.38)	No	High	
Adkins fine sandy loam (gravelly substratum, 0-5% slope)	0.78 (1.92)	Yes	Moderate	
Gravel pit	0.19 (0.48)	No		
Subtotal	3.96 (9.78)			
Western 230-kV Alternative[1]				
Adkins fine sandy loam (0-5% slope)	3.03 (7.48)	Yes	Moderate	
Adkins fine sandy loam (5-25% slope)	3.03 (7.48)	No	Moderate	Moderate
Burbank Loamy fine sand	24.82 (61.32)	No	High	
Gravel Pit	1.5 (3.69)	No		
Powder silt loam	0.36 (0.90)	No		
Quincy fine sand	2.89 (7.13)	No	High	
Quincy loamy fine sand	26.24 (64.8)	No	High	
Water	0.2 (0.48)	No		
Xerofluvents	0.24 (0.59)	No		
Xerollic Durorthids (30-60% slope)	0.10 (0.25)	No		
Subtotal	56.35 (139.16)			
Eastern 500-kV Alternative[2]				
Adkins fine sandy loam (0-5% slope)	15.95 (39.39)	Yes	Moderate	
Burbank loamy fine sand	0.53 (1.30)	No	High	
Quincy fine sand	0.74 (1.82)	No	High	
Quincy loamy fine sand	6.71 (16.56)	No	High	
Starbuck very fine sandy loam	0.60 (1.48)	No	Moderate	Moderate
Taunton fine sandy loam	0.35 (0.86)	No	Moderate	
Thatuna silt loam	0.31 (0.77)	No	Moderate	Moderate
Wanser loamy fine sand	1.06 (2.62)	No	High	
Winchester sand	7.58 (18.73)	No	High	
Subtotal	33.83 (83.53)			
NWP Gas Line Route				
Adkins fine sandy loam (0-5% slope)	9.72 (24.00)	Yes	Moderate	
Quincy fine sand	1.61 (3.99)	No	High	
Quincy loamy fine sand	8.73 (21.56)	No	High	
Taunton fine sandy loam	1.00 (2.47)	No	Moderate	
Thatuna silt loam	0.31 (0.77)	No	Moderate	Moderate
Subtotal	21.38 (52.78)			

Table 3.1-2. Soils Information by Project Component

	Ha (acres)	Prime Farmland	Erosion	
			Wind	Water
PGT Gas Line Route				
Adkins fine sandy loam (10-25% slope)	6.05 (16.91)	No	Moderate	Moderate
Esquatzel silt loam	1.13 (2.78)	No	Moderate	
Quincy loamy fine sand	1.38 (3.40)	No	High	
Taunton fine sandy loam	0.36 (0.88)	No	Moderate	
Subtotal	9.71 (23.97)			

Source: Soil Conservation Service (SCS) 1988
[1] Includes the UECA 115-kV Relocation route
[2] Includes the BPA 500-kV Lower Monumental Relocation route

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

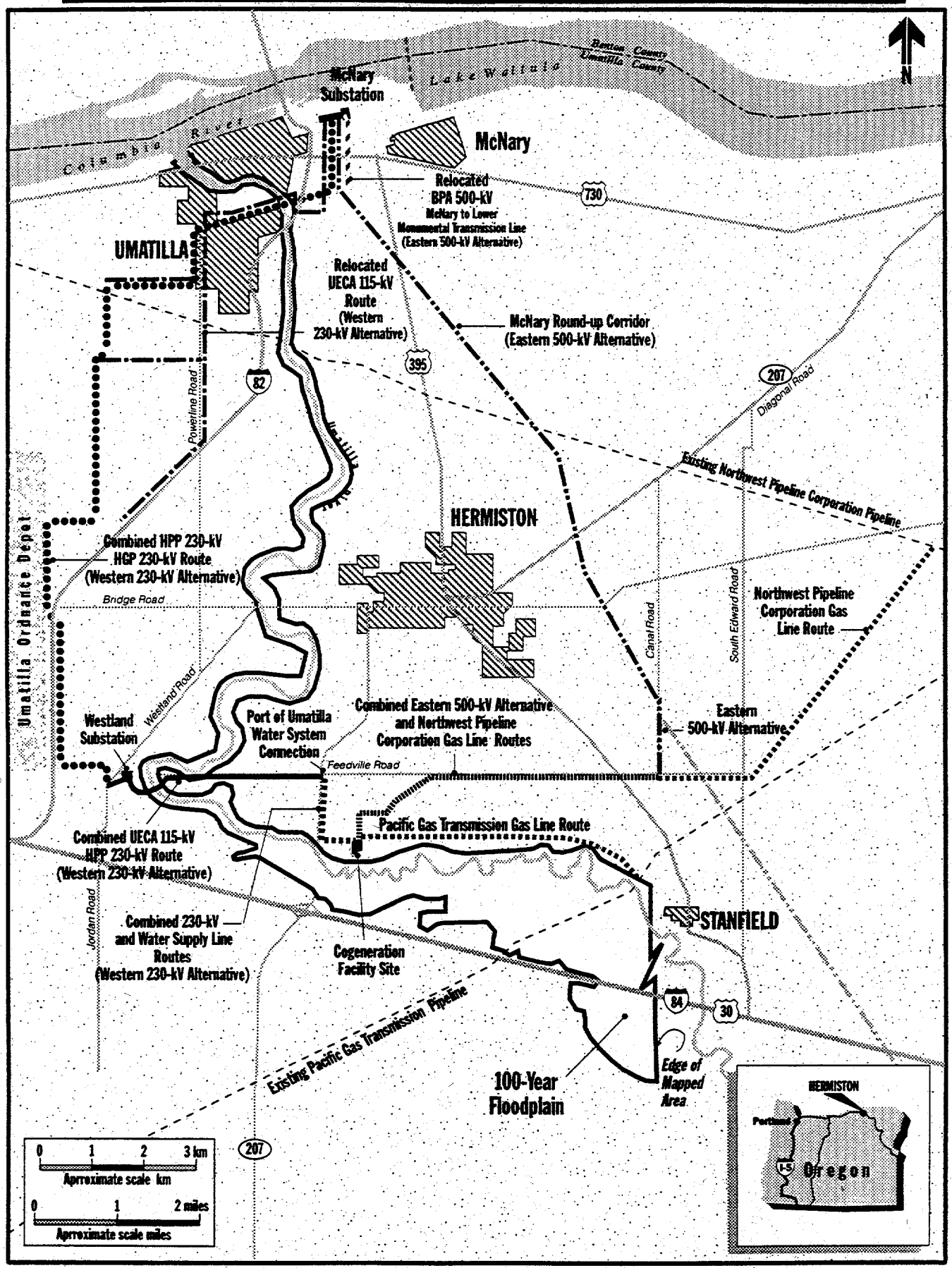


Figure 3.1-5 100-year Floodplain in the Project Vicinity

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]).

Groundwater

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

	Water Level		NO_3 - N		Electrical Conductivity		TDS	
Well	Min.[1]	Date	Max.[2]	Date	Max[3]	Date	Max[4]	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 μmhos/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

	Air Emissions MTY (TPY)[1]		
Pollutant	*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)

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.

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.

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

Table 3.3-3. Regional Ambient Air Pollution Concentrations

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

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.

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 (L_{eq}) 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, L_{10} is the noise level exceeded 10 percent of the time. The L_{90} 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 L_{eq} 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 L_{eq} 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 L_{50} and L_{10} noise levels were 51 and 53 dB(A), respectively. The Feedville Road L_{50} and L_{10} 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

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

levels, L_{90}, were also measured. The minimum daytime and nighttime $\pm L_{90}$ were 41 and 42 dB(A). The ambient nighttime L_{eq} 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.

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	7:00 am	62.3
Minimum	12:00 pm	40.3
L_{50}		
Maximum	7:00 am	64.8
Minimum	1:00 pm	44.3
L_{10}		
Maximum	8:00 am	70.8
Minimum	2:00 am	46.3
L_{eq}		
Maximum	8:00 am	66.3
Minimum	4:00 am	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 2.5-1, 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 2.5-1, 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.

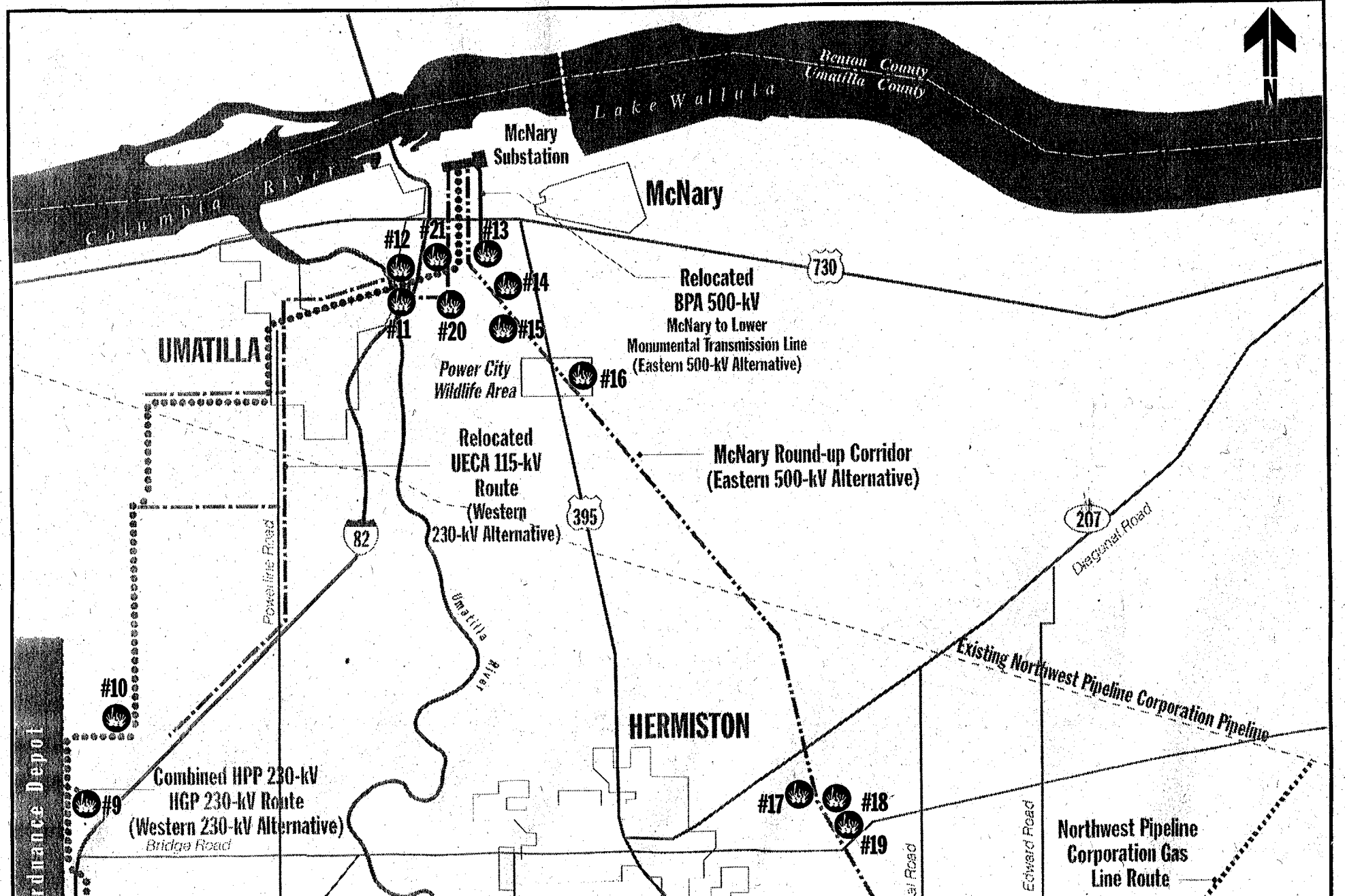
3.5.2 Threatened, Endangered, and Sensitive Plant Species

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


Columbia River
Lake Wallula
Benton County
Umatilla County
N
McNary Substation
McNary
#12
#21
#13
#14
#11
#20
#15
#16
730
UMATILLA
Power City Wildlife Area
Relocated BPA 500-kV McNary to Lower Monumental Transmission Line (Eastern 500-kV Alternative)
Relocated UECA 115-kV Route (Western 230-kV Alternative)
McNary Round-up Corridor (Eastern 500-kV Alternative)
82
395
207
Diagonal Road
Powerline Road
Umatilla River
Existing Northwest Pipeline Corporation Pipeline
#10
HERMISTON
#9
Combined HPP 230-kV HGP 230-kV Route (Western 230-kV Alternative)
Bridge Road
#17
#18
#19
Northwest Pipeline Corporation Gas Line Route
Edward Road
Depot

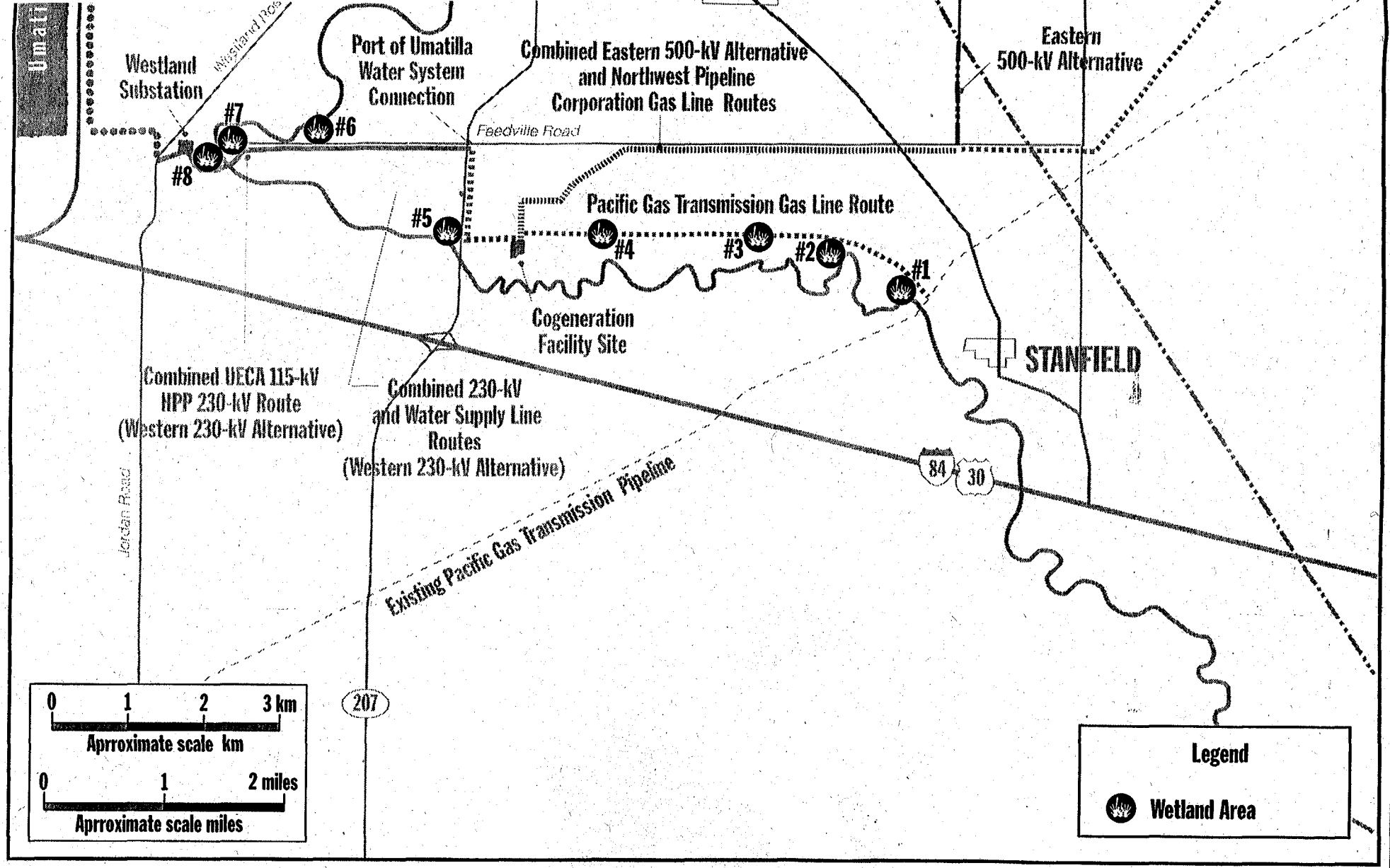


Figure 3.5-1
Wetland Locations

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

Table 3.6-1. Wildlife Habitats Within the Mapped Area Associated with Project Components

Habitat Type	Cogeneration Facility Site		Eastern 500-kV Alternative[1]		Western 230-kV Alternative[2]		PGT Gas Line		NWP Gas Line		Water Supply Line		Total[3]	
	ha (acres)	%	ha (acres)	%	ha (acres)	%	ha (acres)	%	ha (acres)	%	ha (acres)	%	ha (acres)	%
Sagebrush	0	0	122 (302)	13	58.7 (145)	4	83.8 (207)	68	26 (65)	6	4.5 (11)	9	251 (621)	10
Rabbitbrush	0	0	103 (254)	11	243 (600)	15	0	0	34 (85)	7	0	0	216 (533)	5
Bitterbrush	0	0	68.4 (169)	7	61.9 (153)	4	0	0	0	0	0	0	130 (322)	9
Shrub-steppe Subtotal	**0**	**0**	**293.4 (725)**	**32**	**363.6 (898)**	**23**	**83.8 (207)**	**68**	**60 (150)**	**13**	**4.5 (11)**	**9**	**597 (1,476)**	**24**
Grass	0	0	98.4 (243)	11	94.7 (234)	6	9.3 (23)	8	244 (602)	51	0	0	366 (904)	14
Riparian/Deciduous	0	0	30.3 (75)	3	21 (51)	1	9.3 (23)	8	0	0	0	0	57.1 (141)	2
Wetland	0	0	28.7 (71)	3	13 (33)	1	3.2 (8)	3	0	0	0	0	39.6 (98)	2
Open Water	0	0	0	0	1.2 (3)	0	0.8 (2)	1	0	0	0	0	2 (5)	0
Pasture	0	0	60.3 (149)	7	34 (85)	2	0	0	0	0	0	0	90.3 (223)	4
Cropland	7.7 (19)	100	298 (736)	32	861.5 (2,128)	30	9.7 (24)	8	148 (365)	31	23 (56)	44	1,111 (2,745)	44
Non-vegetated	0	0	111 (273)	12	179 (443)	10	7.3 (18)	6	23 (56)	5	24 (60)	47	268 (662)	11
Total	7.7 (19)	100	891.4 (2,272)	100	1,568 (3,875)	100	123.4 (305)	100	475 (1,173)	100	51.5 (127)	100	2,531 (6,254)	100

1 Incorporates 500-kV McNary - Lower Monumental realignment route.
2 Incorporates UECA 115-kV relocation route.
3 Total acreage of each habitat exceeds sum of components due to overlap among various components.

Source: NWS 1994b

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 2.5-1). 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

Table 3.6-2. Sensitive Wildlife Species Potentially Occurring in the Project Vicinity

Common Name	Status			Observed in Study Area
	Federal	ODFW	ONHP	
Blotched tiger salamander	No Status	Undetermined	1	No
Northern leopard frog	No Status	Vulnerable	1	No
Spotted frog	Category 2 Candidate	Undetermined	1	No
Western toad	No Status	Vulnerable	1	No
Painted turtle	No Status	Critical	1	Yes
Northwestern pond turtle	Category 2 Candidate	Critical	1	No
Northern sagebrush lizard	Category 2 Candidate	No Status	1	No
American white pelican	No Status	Vulnerable	2	Yes
Long-billed curlew	Category 3 Candidate	No Status	3	Yes
Northern bald eagle	Threatened	State Threatened	4	Yes
Swainson's hawk	Category 3 Candidate	Vulnerable	1	Yes
Ferruginous hawk	Category 2 Candidate	Critical	1	No
Peregrine falcon	Endangered	State Threatened	4	No
Mountain quail	Category 2 Candidate	No Status	3	No
Franklin's gull	No Status	Peripheral or Naturally Rare	2	No
Yellow-billed cuckoo	Taxonomic Problems	Critical	2	No
Burrowing owl	Category 2 Candidate	Critical	2	No
Bank swallow	No Status	Undetermined	1	Yes
Loggerhead shrike	Category 2 Candidate	Undetermined	1	No
Grasshopper sparrow	No Status	Undetermined	1	Yes
Tri-colored blackbird	Category 2 Candidate	Peripheral or Naturally Rare	2	No
Pacific western big-eared bat	Category 2 Candidate	Critical	2	No
Pallid bat	No Status	Vulnerable	1	No
Fringed myotis	No Status	Vulnerable	4	No
Long-eared myotis	Category 2 Candidate	No Status	1	No
Long-legged myotis	Category 2 Candidate	No Status	1	No
Yuma myotis	Category 2 Candidate	No Status	1	No
Washington ground squirrel	Category 2 Candidate	Critical	2	No
Pygmy rabbit	Category 2 Candidate	Vulnerable	1	No

ODFW Status: **State Endangered**—wildlife species native to the state of Oregon that are seriously threatened with extinction throughout all or a significant portion of their range within the state. **State Threatened**—wildlife species that are likely to become an endangered species within the foreseeable future throughout a significant portion of their range within the state without cooperative management or removal of threats. **Critical**—species for which listing as threatened or endangered is pending; or those for which listing as threatened or endangered may be appropriate if immediate conservation actions are not taken. **Vulnerable**—species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring. **Peripheral or Naturally Rare**—peripheral species refer to those whose Oregon populations are on the edge of their range. Naturally rare species are those which had low population numbers historically in Oregon because of naturally limiting factors. **Undetermined**—animals in this category are species for which status is unclear. They may be susceptible to population decline of sufficient magnitude that they could qualify for endangered, threatened, critical or vulnerable status, but scientific study will be required before a judgment can be made.

USFWS Status: **Federal Endangered**—designated as an endangered species by the Federal government. **Federal Threatened**—designated as a threatened species by the Federal government. **Category 2 Candidate**—need additional information to propose as threatened or endangered under the Endangered Species Act. **Category 3 Candidate**—once listed as a Category 1 or Category 2, but is no longer listed.

ONHP Status:

1 = additional information is needed for a determination of status in Oregon
2 = threatened with extripation or presumed extripated from the state, often peripheral or disjunct
3 = of concern but not currently threatened or endangered; includes taxa that are rare but currently secure, as well as taxa declining in abundance or habitat, but still too common to be proposed as threatened or endangered.
4 = threatened with extinction throughout its range, needing active protective measures

Sources: letters from R. Peterson, Field Supervisor, USFWS, Portland, Oregon, April 12, 1994 and June 27, 1995.
ODFW 1992
ONHP 1993, and 1995

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.

State-listed Wildlife Species

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.

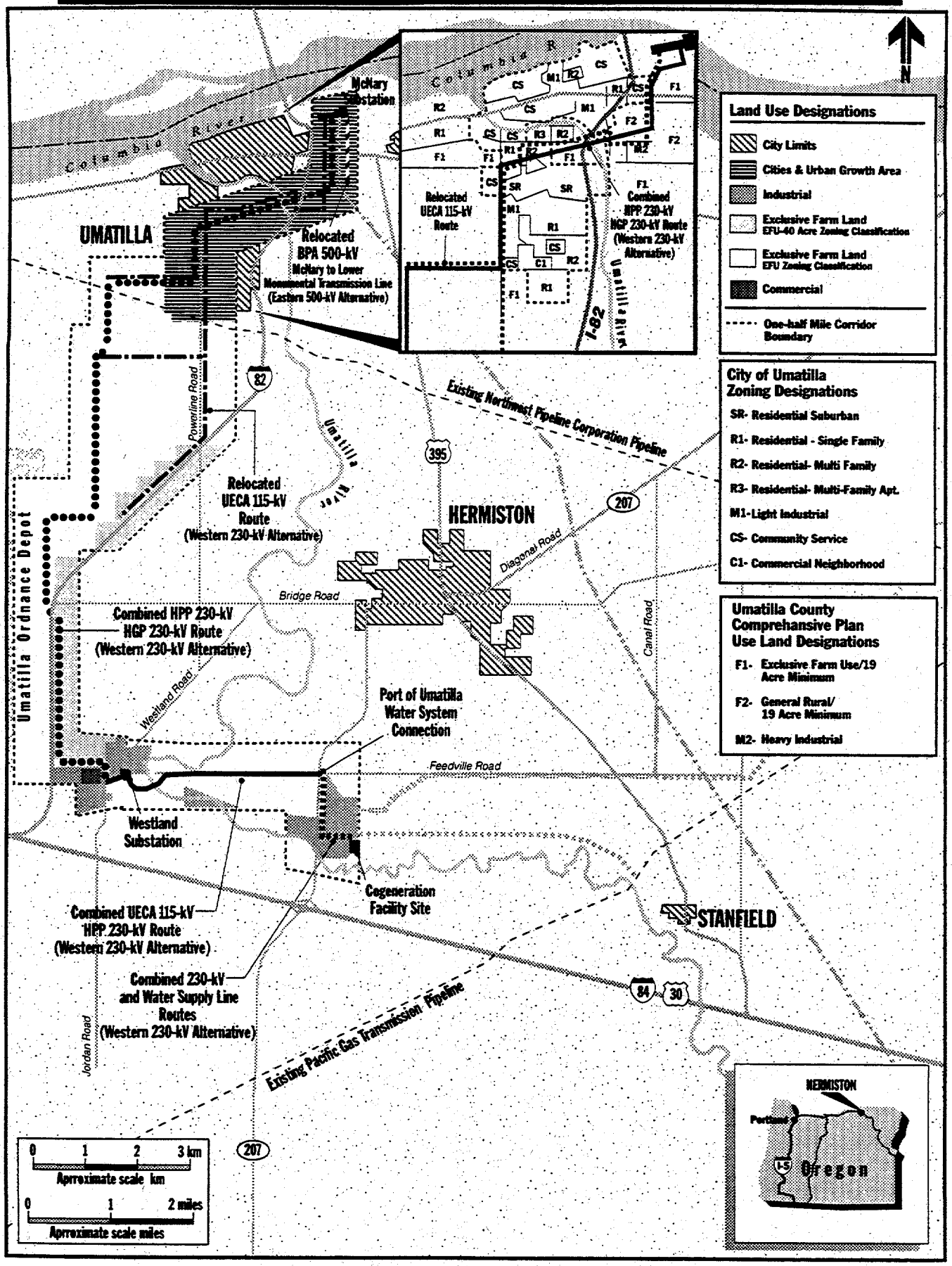


Figure 3.7-1a Land Use Designations in the Project Vicinity

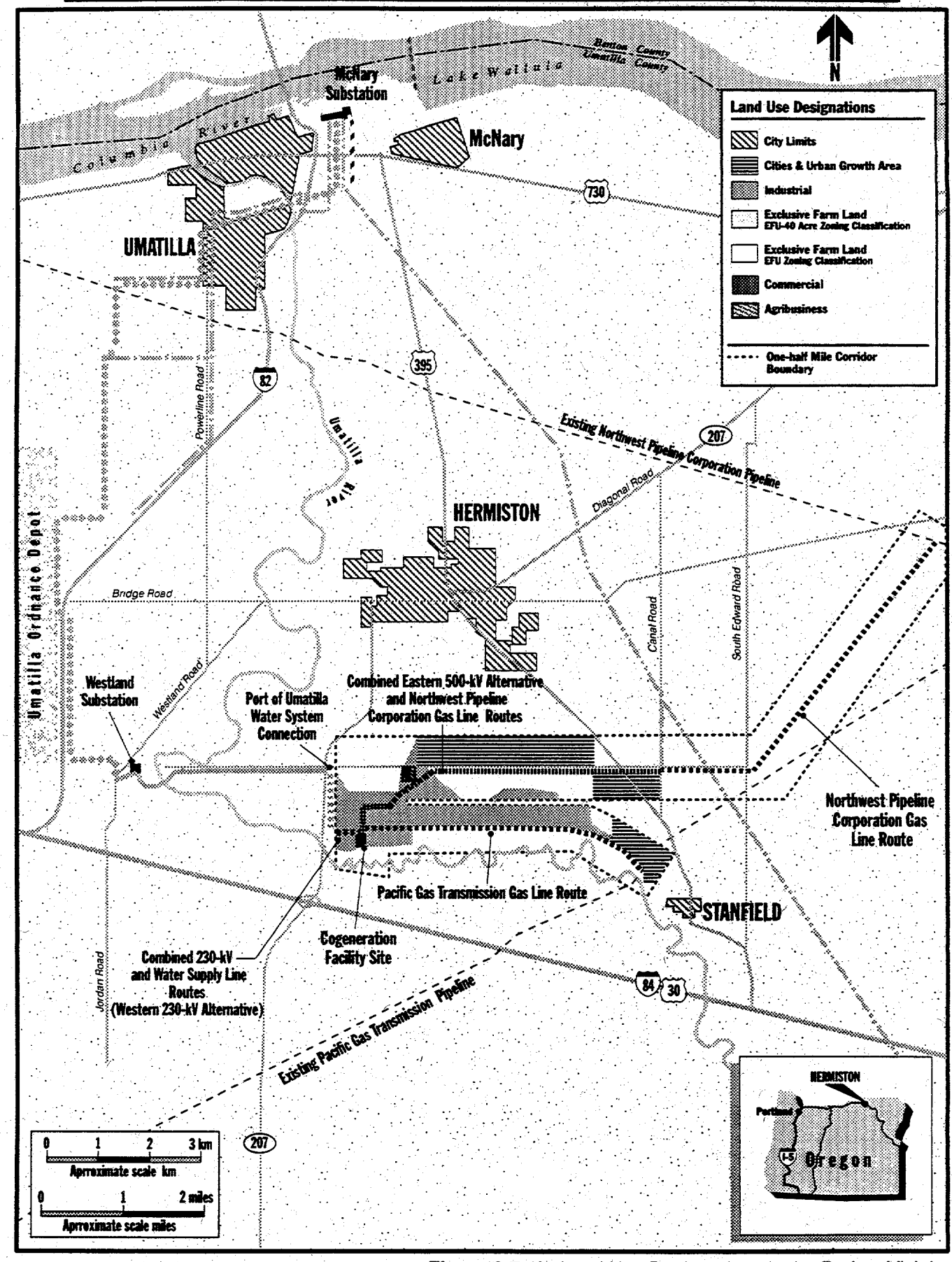


Figure 3.7-1b Land Use Designations in the Project Vicinity

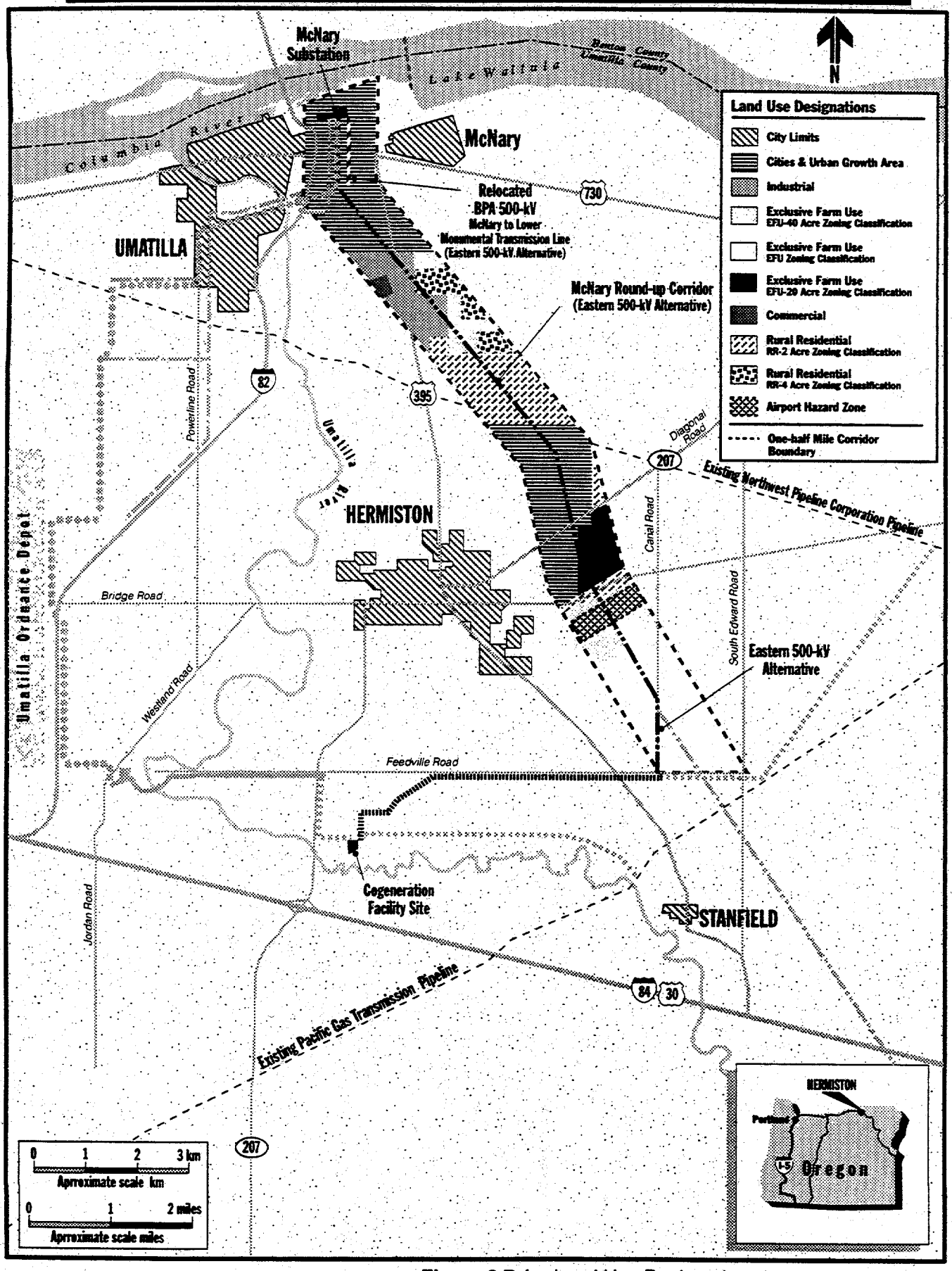


Figure 3.7-1c Land Use Designations in the Project Vicinity

Table 3.7-1. Land Use and Zoning Designations for Project Components

Land Use Plans/Designations	Cogen. Facility Site	East. 500-kV Alt.[1]	West. 230-kV Alt.[2]	Water/ Wastewater Lines	PGT Gas Line	NWP Gas Line
Umatilla County Comprehensive Plan						
Heavy Industrial	XP	XP	XP	XP	XP	XP
Light Industrial	—	XC	XC	—	—	—
Future Industrial Overlay Zone	—	XC	—	XP	XC	XC
Exclusive Farm Use	—	XC	XC[5]	XP	—	XC
Exclusive Farm Use—20-acre minimum	—	XC	—	—	—	—
Exclusive Farm Use—40-acre minimum	—	XC	XC[5]	—	XC	XC
Rural Residential—2	—	XC	—	—	—	—
Rural Residential—4	—	XC	—	—	—	—
Agribusiness	—	XC	XC	XC	—	XC
City of Hermiston Urban Growth Area Designations						
Residential Medium Density Mobile Home	—	XC	—	—	—	—
City of Umatilla Urban Growth Area Comprehensive Plan Designations						
General Commercial	—	XC	—	—	—	—
Light Industrial	—	XC	—	—	—	—
General Rural	—	XC	XC	—	—	—
Exclusive Farm	—	XP	XP	—	—	—
Agricultural Residential	—	—	XC	—	—	—
Tourist Commercial	—	—	XC	—	—	—
City of Umatilla Zoning Designations						
Suburban Residential	—	—	XC	—	—	—
Residential Single Family	—	—	XC	—	—	—
Residential Mobile Home	—	—	X[4]	—	—	—
General Commercial	—	—	XC	—	—	—
Community Service	—	XC	XC	—	—	—
City of Stanfield Urban Growth Area Designations						
Industrial Service Commercial	—	XP[3]	—	—	—	XP[3]
Exclusive Farm Use	—	XP[3]	—	—	—	XP[3]
Transportation Industrial	—	—	—	—	XP[3]	—

X = Facility located in or goes through designation
— = Facility does not go through designation
P = Permitted use
C = Conditional use
[1] Includes BPA 500-kV Lower Monumental Relocation
[2] Includes UECA 115-kV Relocation not included
[3] Permitted as similar use
[4] Compliance with statewide planning goals
[5] Conversion of 115/230 to 230/230 is permitted use

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-khà-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	2,633,156	58,861	9,408	1,568	3,194
1990	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

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).

Table 3.9-2. Minority Group Breakdown

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

Source: U.S. Bureau of Census 1990

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

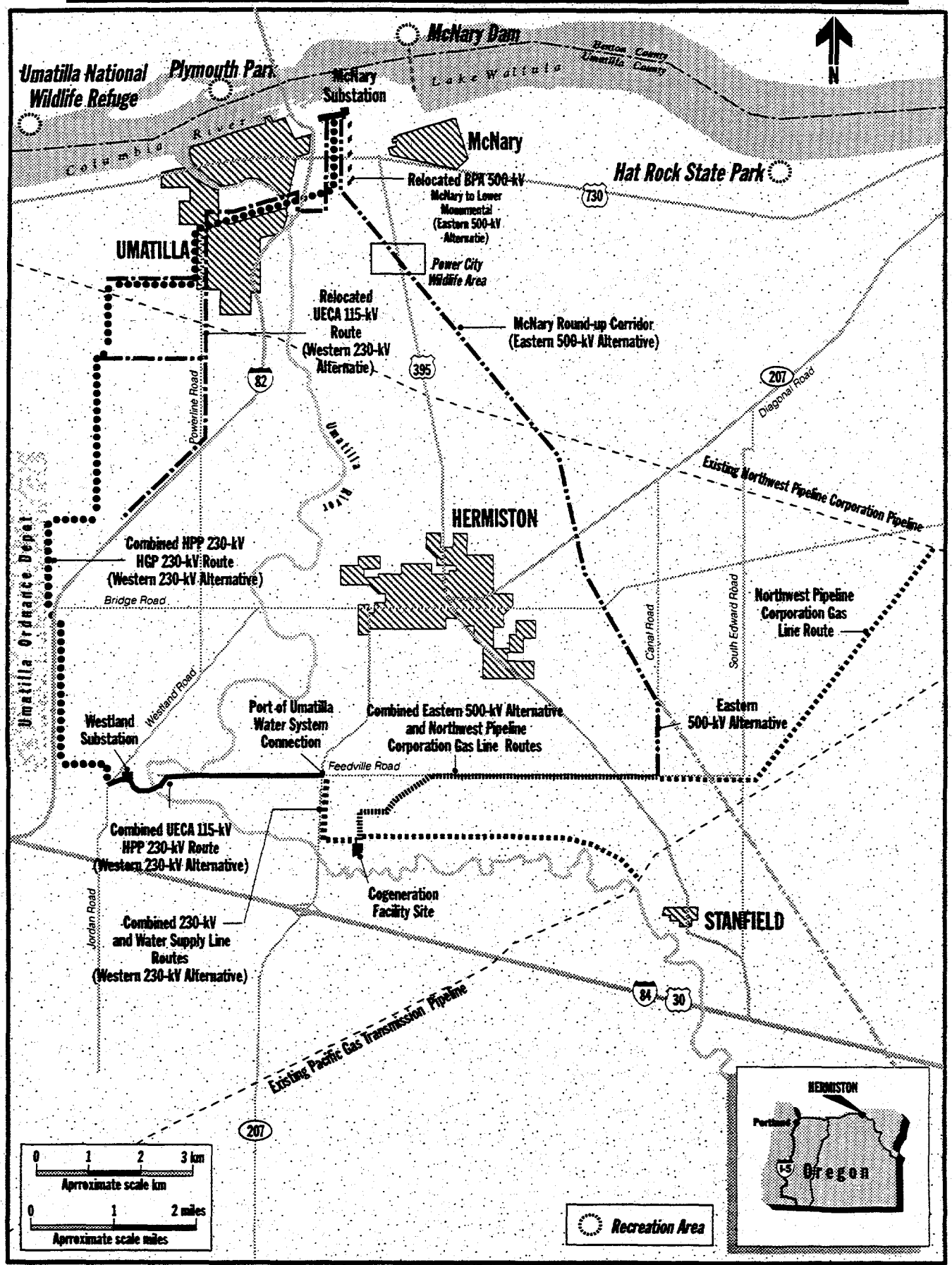


Figure 3.10-1 Recreation Facilities in the Project Vicinity

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 Strengths 0.3 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.

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.

Table 3.11-2. Typical Electric and Magnetic Field Strengths from 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.

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.

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:

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

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	Low NO_x combustors with SCR
Fuel Oil Firing	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

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. 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 $\mu g/m^3$. 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

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

	Pollutant (MTY [TPY])				
	NO_x	PM_{10}	CO	SO_2	VOC
Turbine					
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

Table 4.3-3 Predicted Air Pollutant Concentrations

Pollutant	Maximum Concentrations ($\mu g/m^3$)	AAQS ($\mu g/m^3$)	PSD Increment (Class II) ($\mu g/m^3$)	De Minimis Monitoring Levels ($\mu g/m^3$)	Oregon SILs ($\mu g/m^3$)
PM_{10} (annual)	0.238	50	17		0.2[1]
PM_{10} (24-hour)	8.3	150	30	10	1.0[1]
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 $\mu g/m^3$ for the annual average and 5.0 $\mu g/m^3$ for the 24-hour average.
Source: EMCON 1994b

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

		Concentration ($\mu g/m^3$)	
Toxic Air Pollutant	*Averaging Time*	*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.

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

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

perceptibility (color difference) parameter, ΔE, which is a function of difference in brightness, color hue, and saturation. The contrast and ΔE 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 ($\Delta E = 0.671$ and contrast = 0.007) and were much smaller than the screening criteria ($\Delta E = 2.0$, 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).

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 4.3-6 Maximum Predicted Concentrations in PSD Class I Areas

Location	Pollutant	Averaging Period	Maximum Predicted Concentration ($\mu g/m^3$)	PSD Class I Increment ($\mu g/m^3$)
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

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

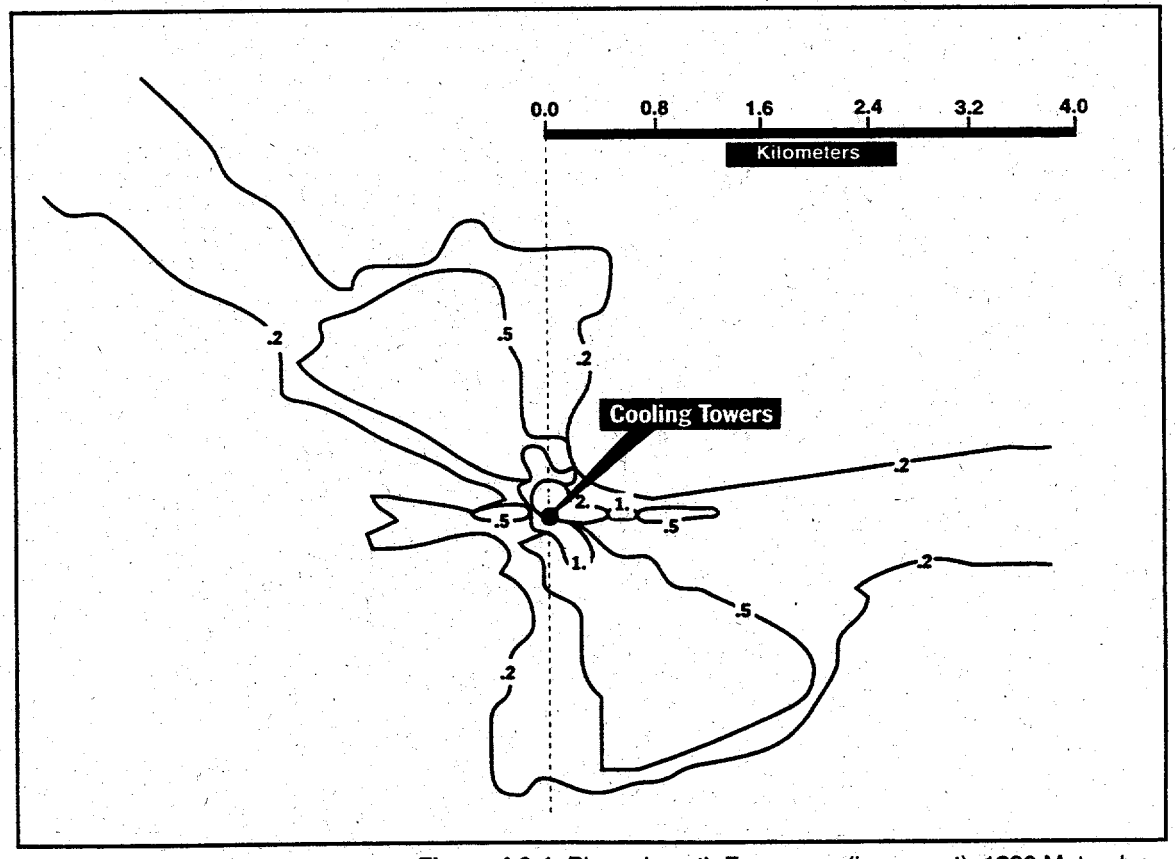


Figure 4.3-1 Plume Length Frequency (in percent), 1990 Meterology

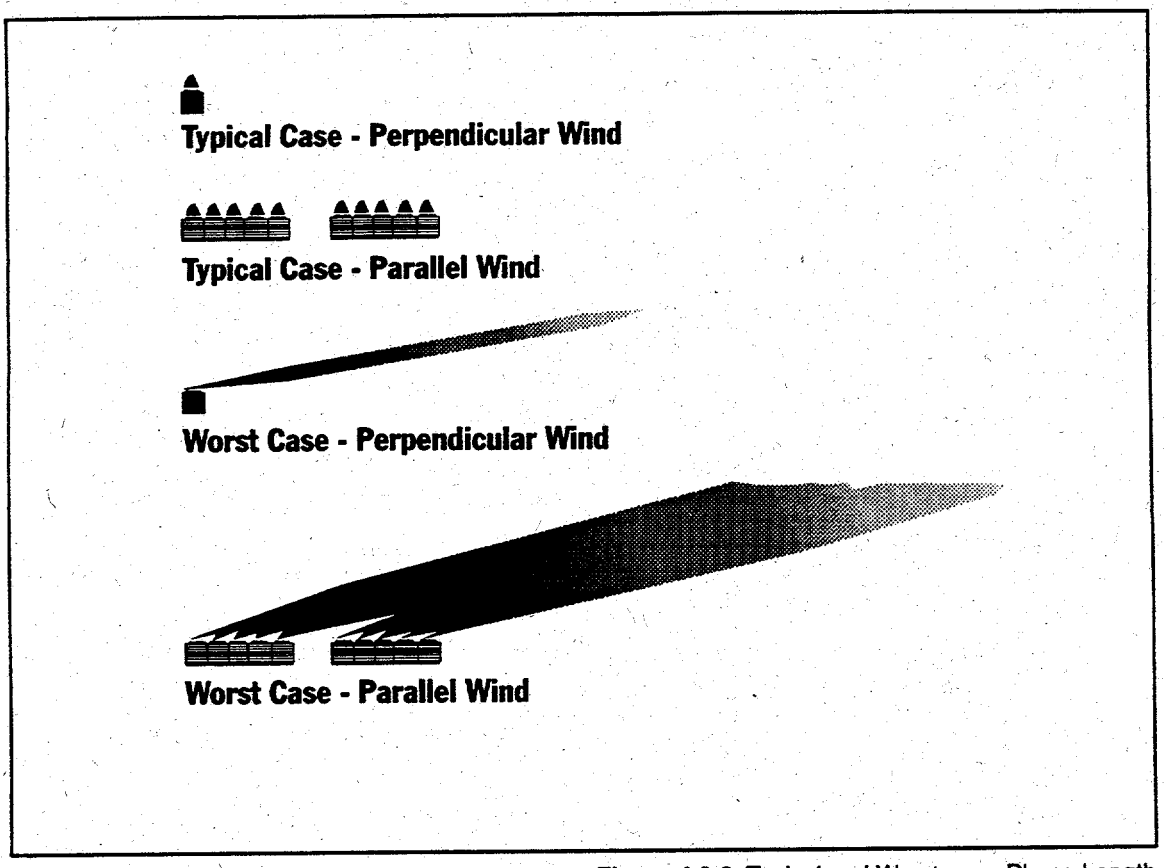


Figure 4.3-2 Typical and Worst-case Plume Length

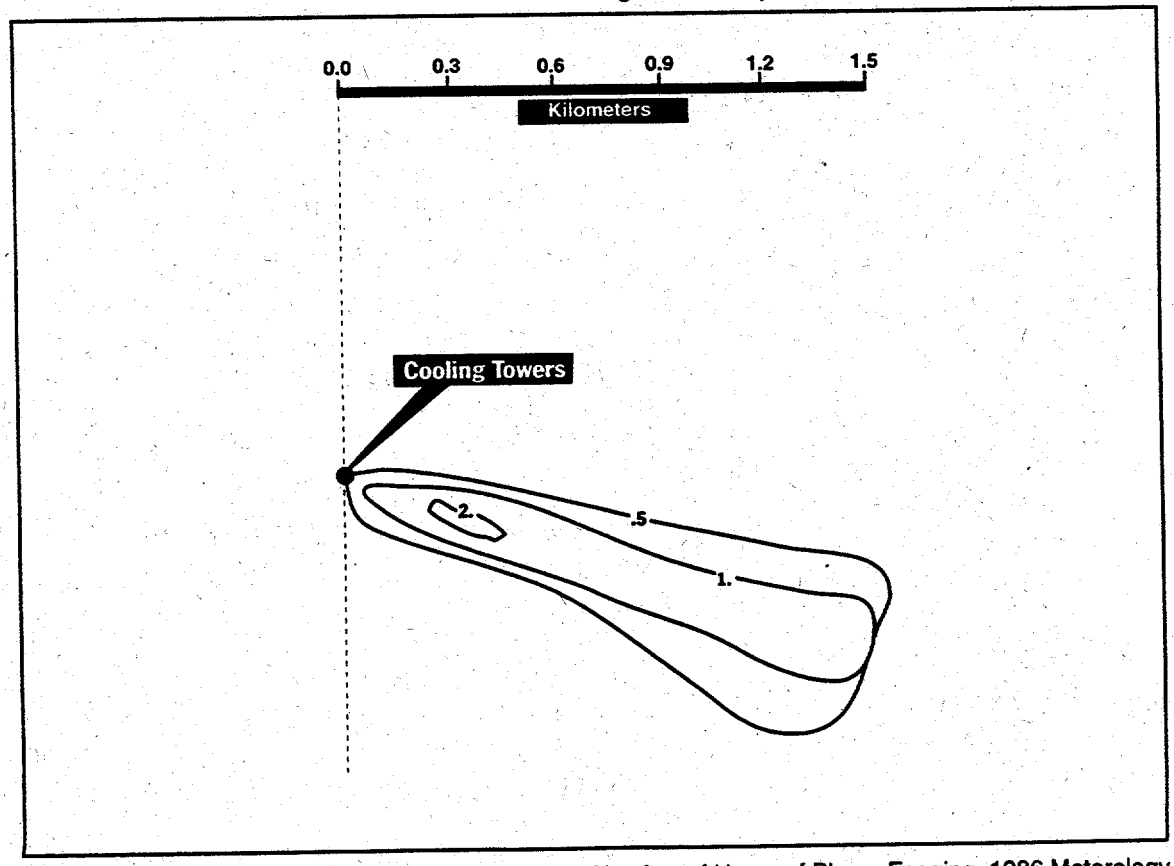


Figure 4.3-3 Number of Hours of Plume Fogging, 1986 Meterology

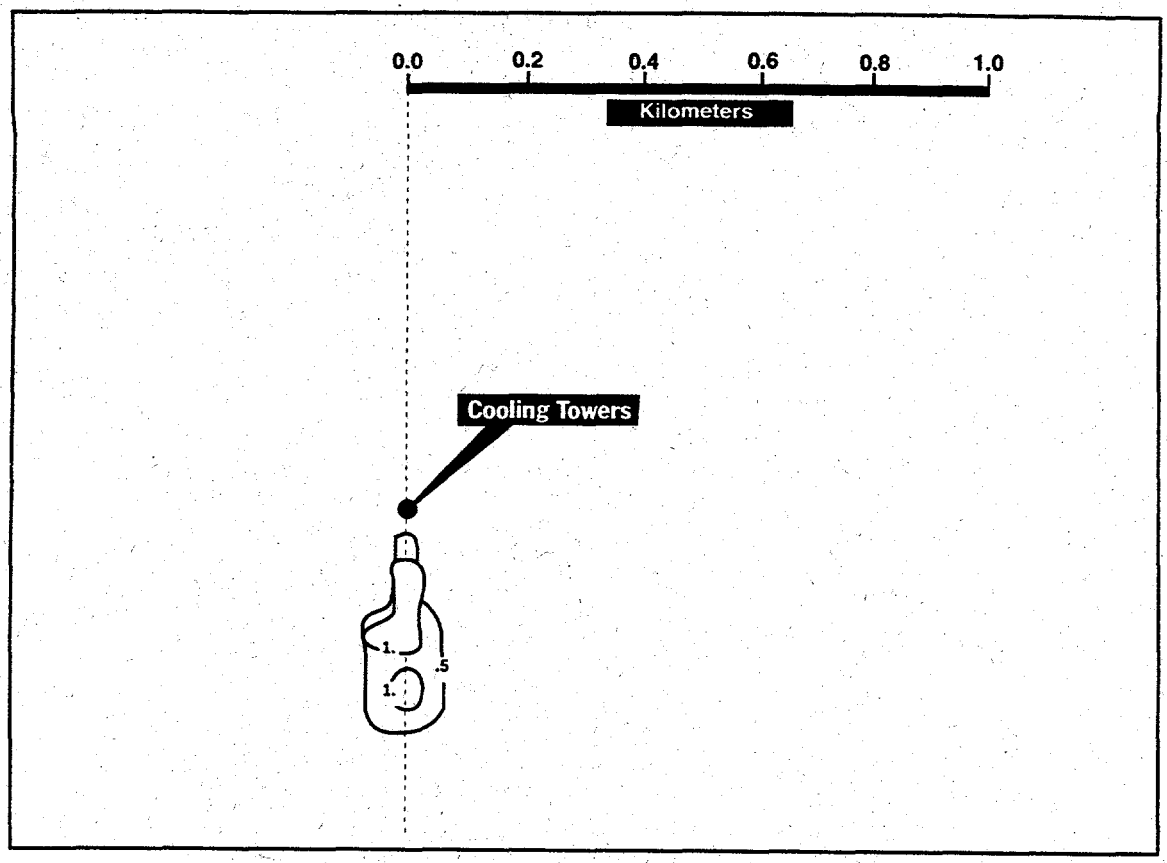


Figure 4.3-4 Number of Hours of Icing, 1990 Meterology

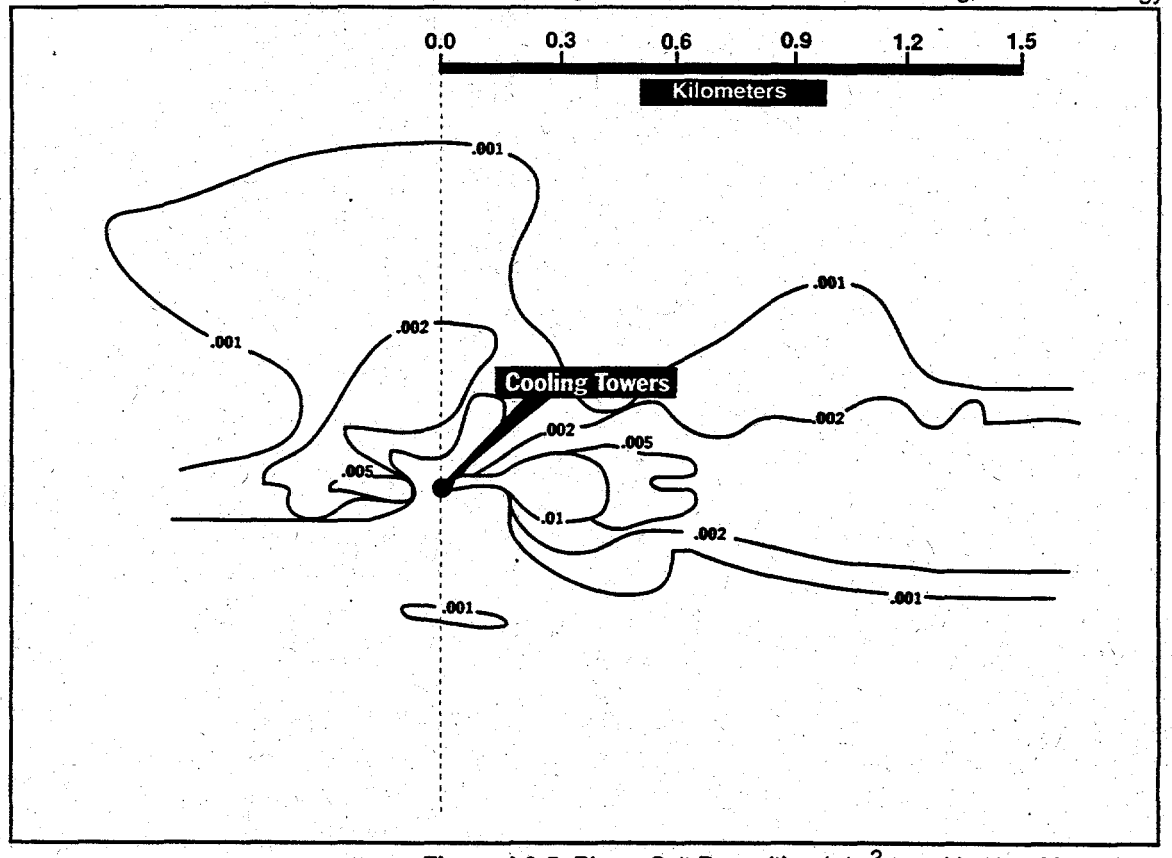


Figure 4.3-5 Plume Salt Deposition (g/m^2-month), 1990 Meterology

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.

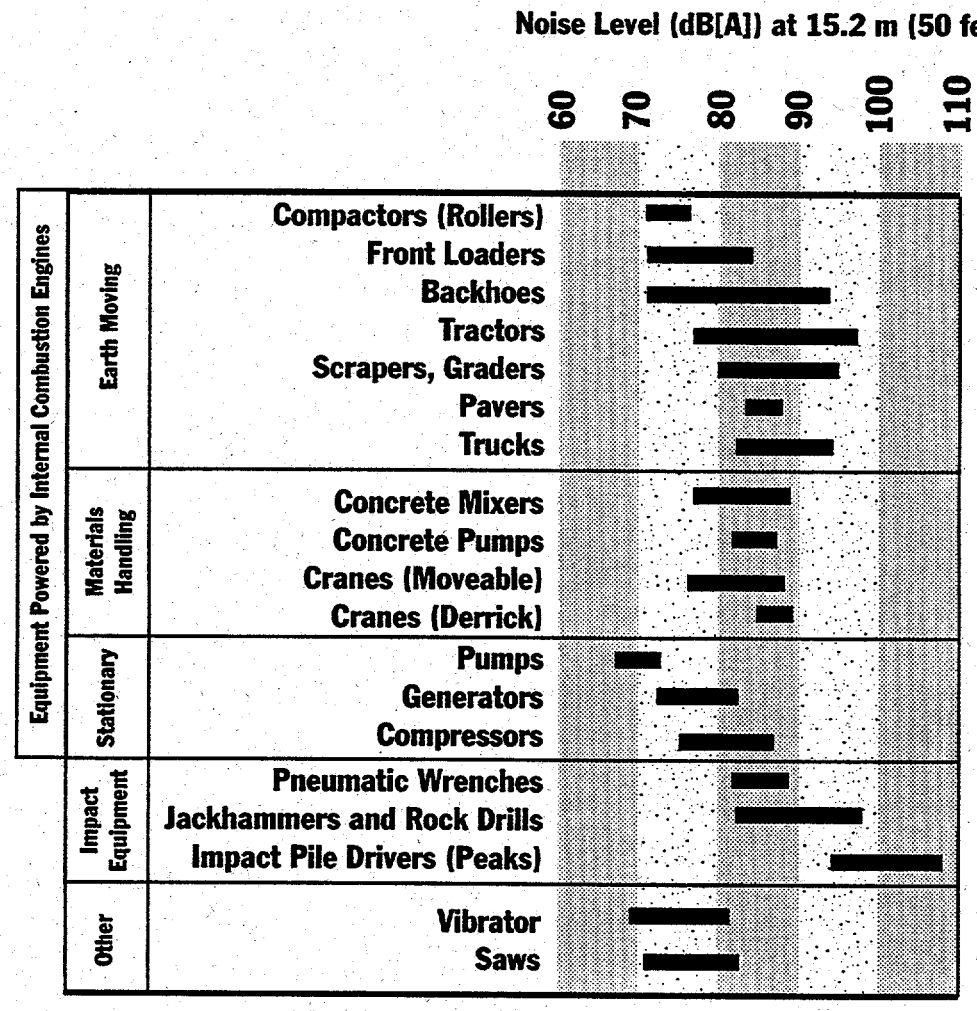
4.4.2 Cogeneration Facility

Noise would emanate from the HRSG, stacks, generator building, cooling tower, and transformers. ODEQ has established allowable noise levels from industrial facilities. The nighttime L_{50} criteria would be the most stringent noise standard applicable to this project (Table 4.16-1). 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 L_{50} 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



Source: Oregon State Highway Division 1990

Figure 4.4-1 Typical Construction Sound Levels

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 L_{eq} 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 L_{50} noise level of 44 dB(A). The ODEQ nighttime L_{50} 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 L_{50} 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 2.6-1). 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 2.6-1). 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

	Disturbance Areas			
Project Component	*Total ha (Acres)*	*Temporary ha (Acres)*	*Permanent ha (Acres)*	*Habitat Types Affected*
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 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 2.7-1, 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 2.7-1b). 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 2.7-1b). 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.

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

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.

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.

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)	[1]	100 (378)
6	Shot Chemical Feed Tank (Closed Cooling Corrosion Inhibitor)	[1]	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.

[1] Sodium metasilicate, sodium hydroxide, sodium nitrate, sodium tetraborate.

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.

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

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 Demineralizer Resins	Nonhazardous	48 cu. m (1,700 cu. ft)	Once Every 8-10 Years	None	None	Recycle to Resin 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

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.

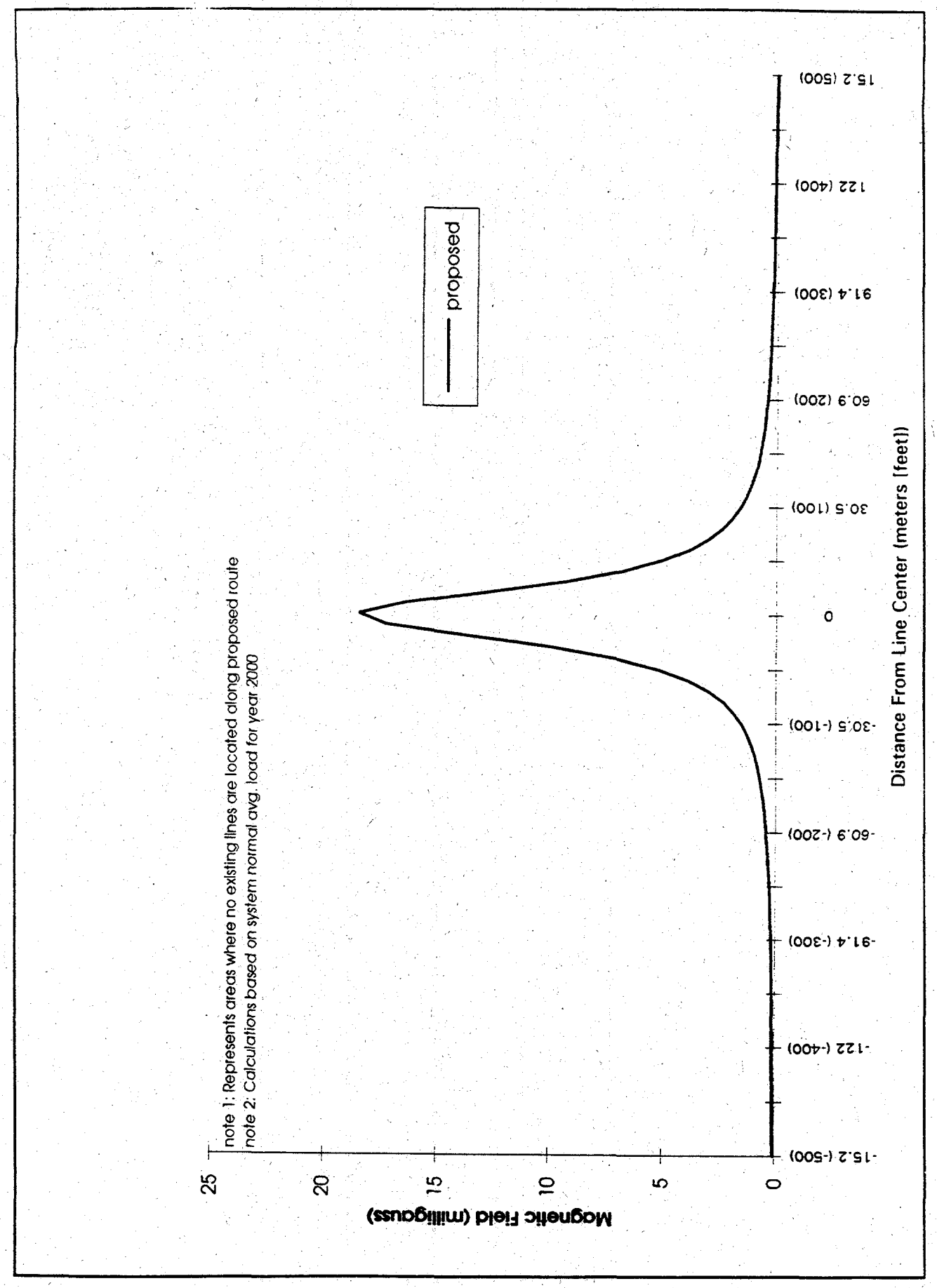


Figure 4.11-1 Western 230-kV Alternative: Magnetic Field Profile for UECA Relocated 115-kV Transmission Line

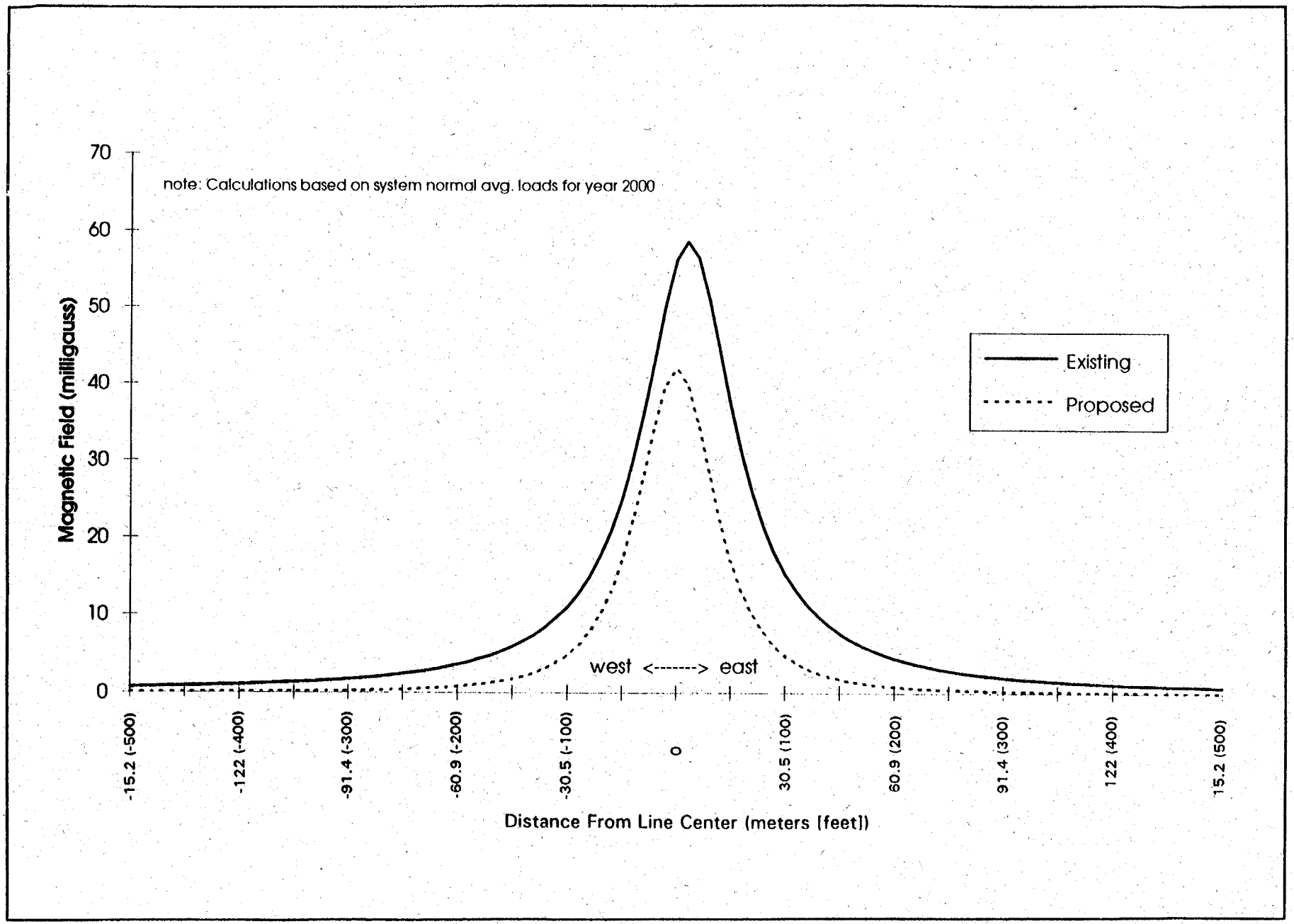


Figure 4.11-2 Western 230-kV Alternative: Magnetic Field Comparison Between Existing and Proposed Double Circuit 230-kV Transmission Line Configurations-Segment Between Westland and McNary Substations

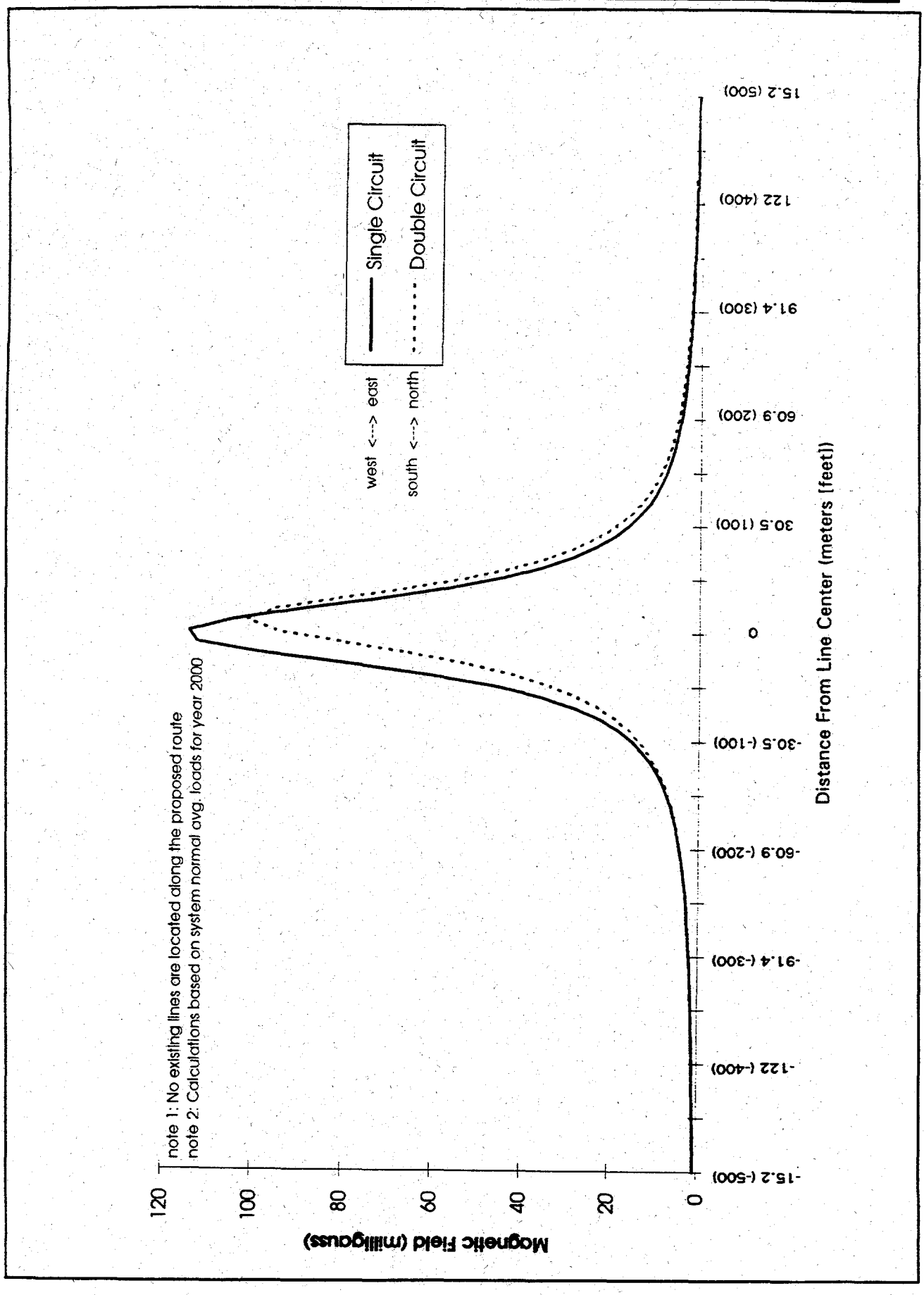


Figure 4.11-3 Western 230-kV Alternative: Magnetic Field Profiles for Proposed Single and Double Circuit Transmission Line Configurations-Segment Between Westland and Cogeneration Facility

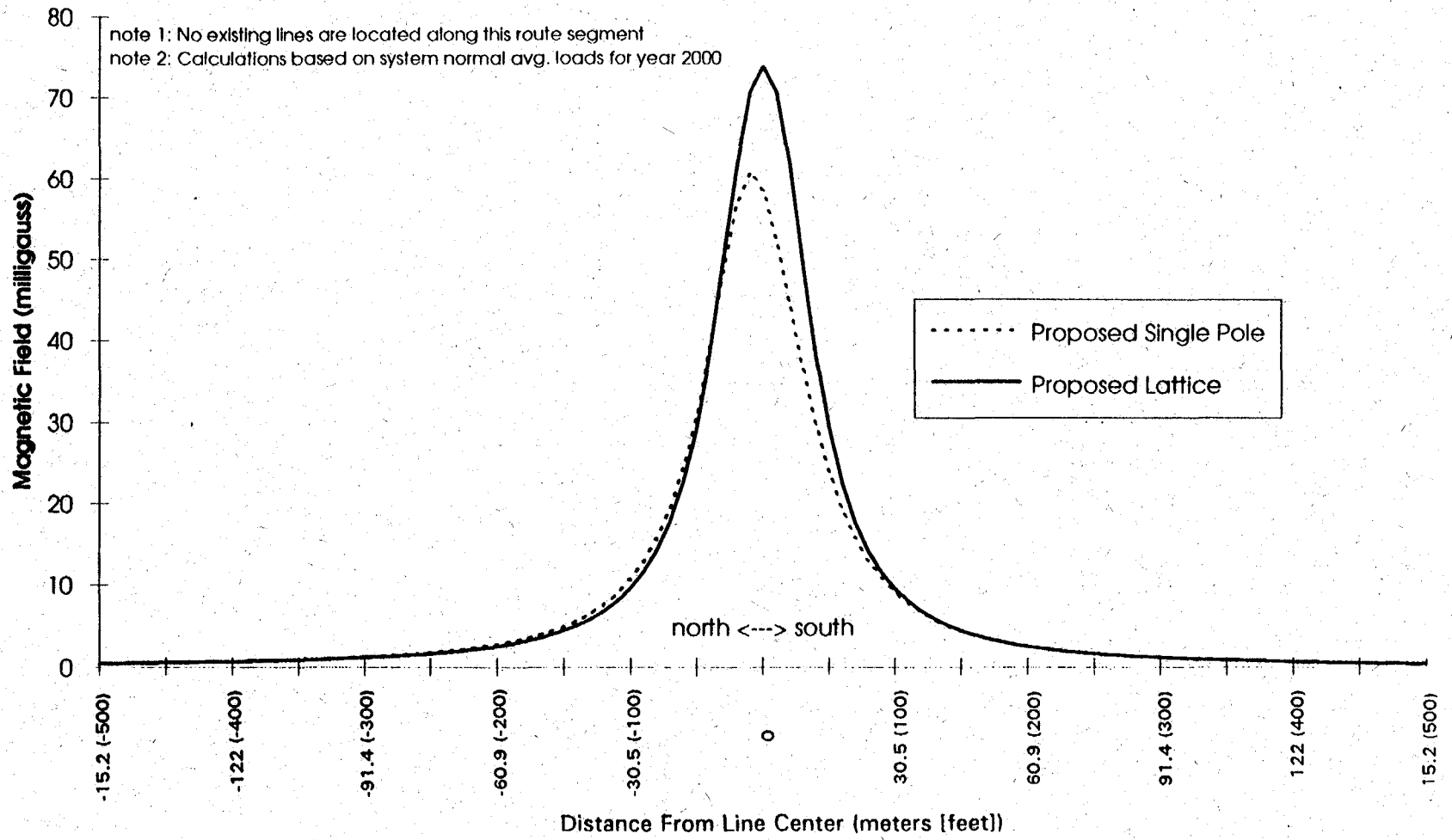


Figure 4.11-4 Eastern 500-kV Alternative: Magnetic Field Profiles for Proposed Transmission Line Configurations-Segment Between Cogeneration Facility and BPA's McNary-Roundup 230-kV Corridor

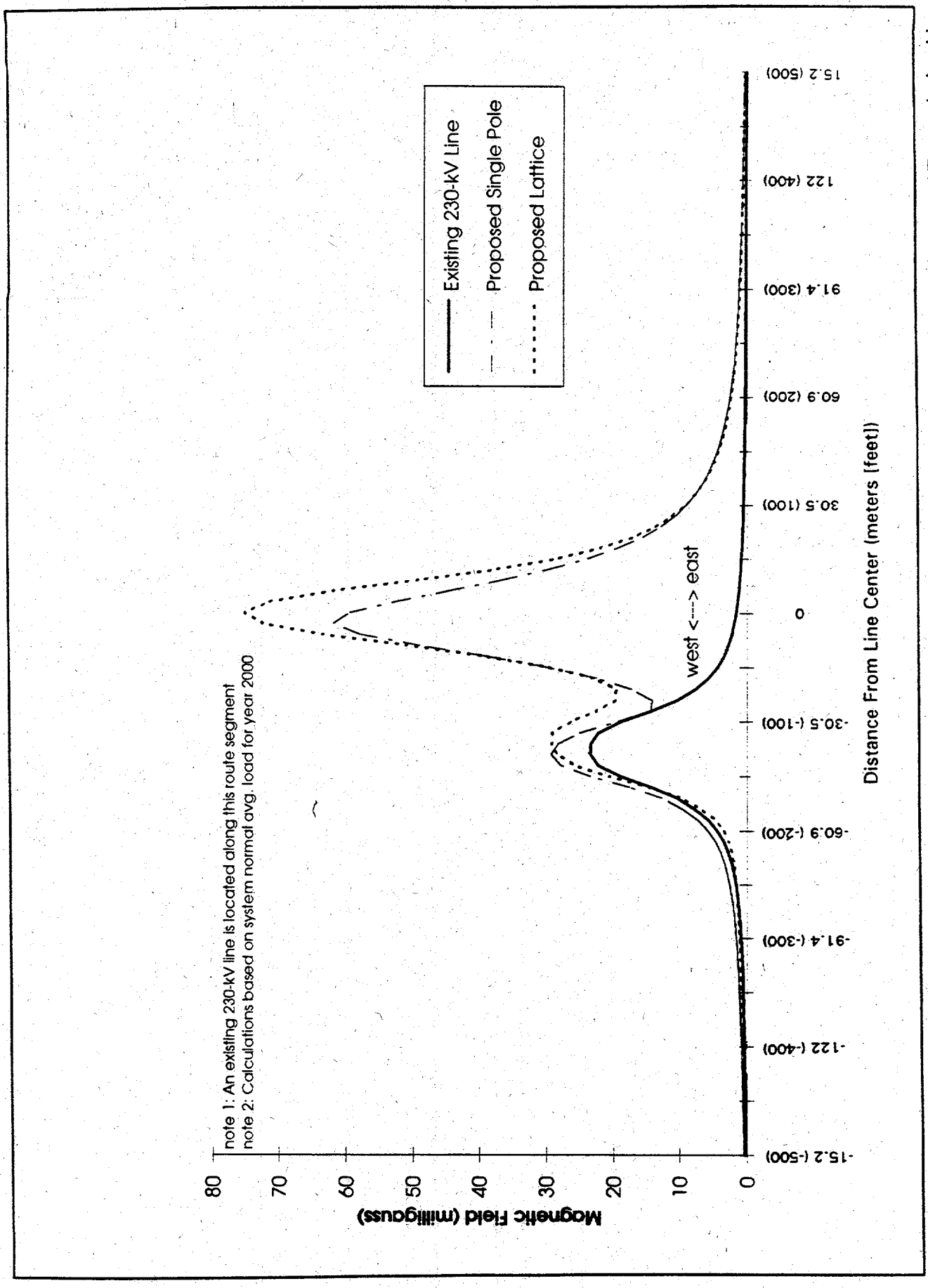


Figure 4.11-5 Eastern 500-kV Alternative: Magnetic Field Comparisons Between Existing Proposed Transmission Line Configurations-Segment Adjacent to BPA's McNary-Roundup 230-kV Line

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.

Water and Gas Pipelines

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.

Transmission Lines

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.

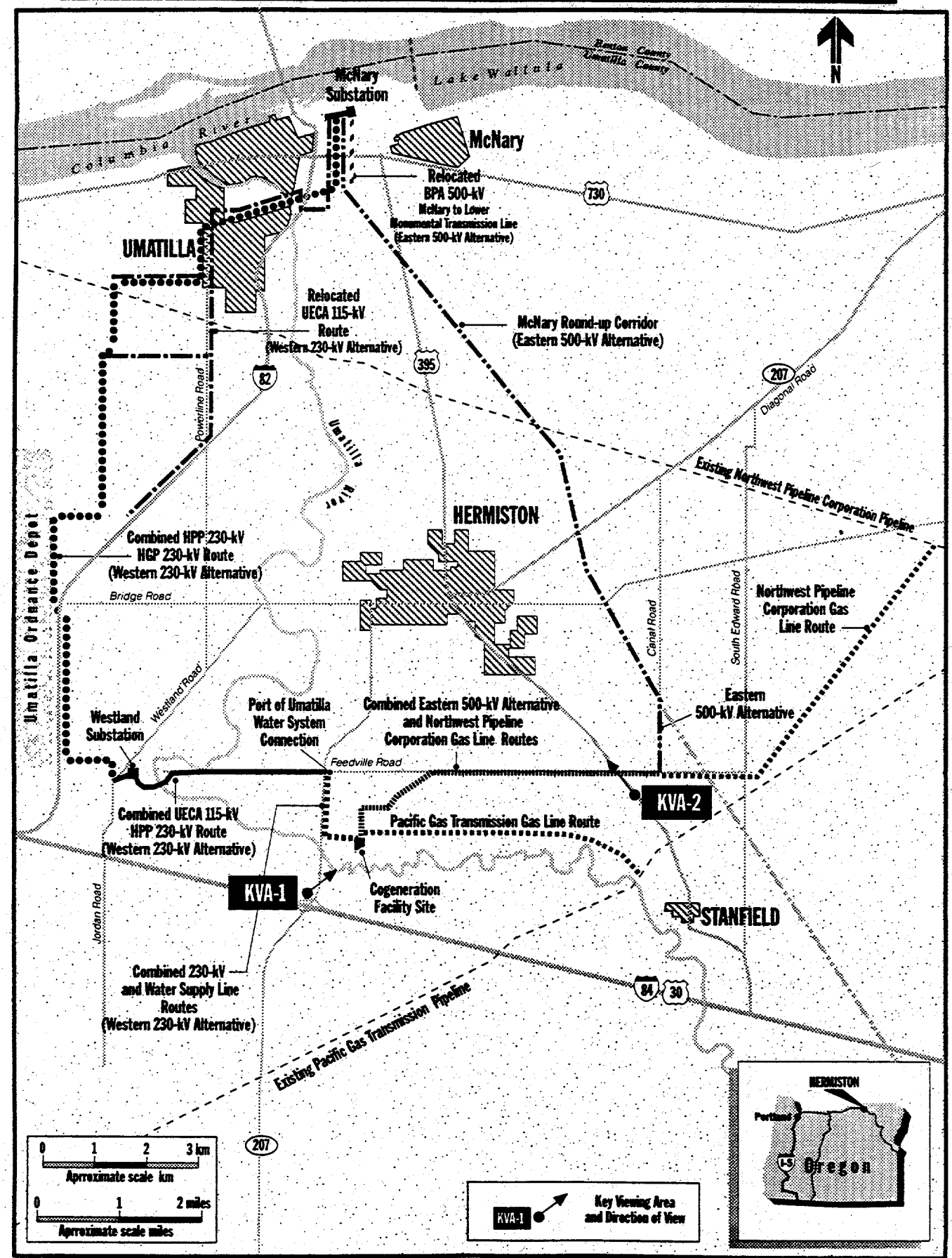


Figure 4.12-1 Key Viewing Area Locations

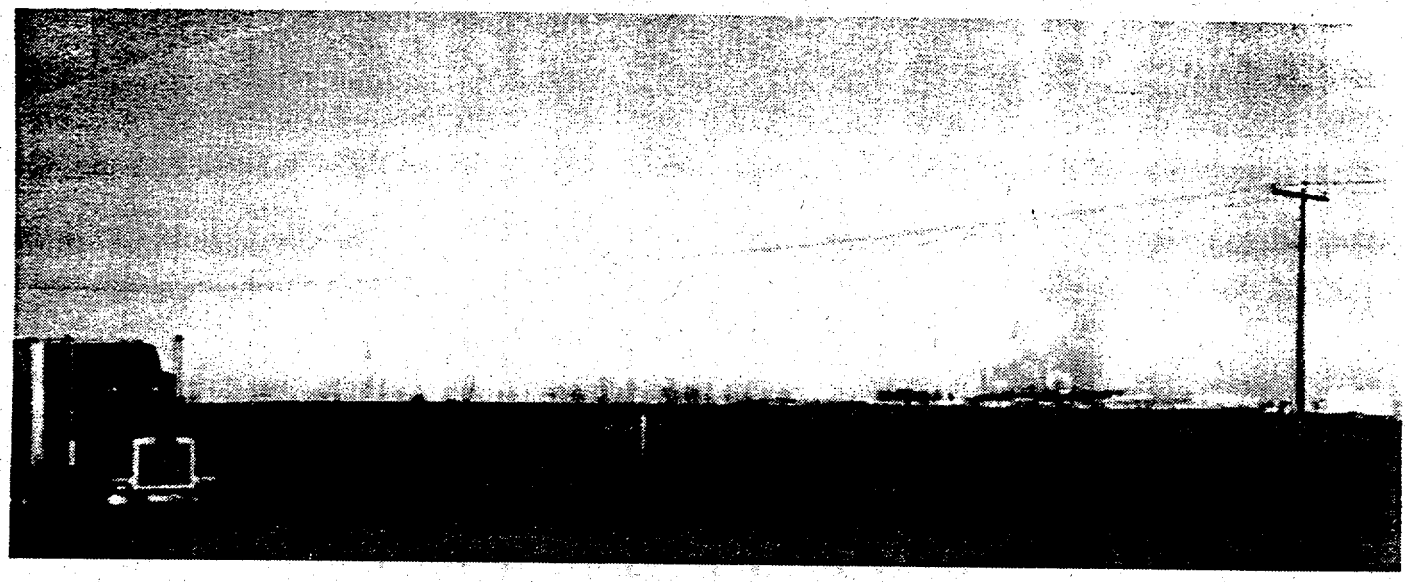


Figure 4.12-2a **KVA-1**—Photo taken from a mini-mart parking lot at the interchange of I-84 and State Route SR 207. View is approximately 0.75 mile from the site of the proposed facility.

Figure 4.12-2b **KVA-1**—Visual simulation of the proposed facility from the same location as Figure 3.12-2a.

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

Figure 4.12-3a **KVA-2**—Photo of existing transmission lines crossing over Highway 395 at the intersection with Feedville Road. Photo is toward the northwest along Highway 395.

Figure 4.12-3b **KVA-2**—Visual simulation of the proposed transmission line crossing over Highway 395 at the intersection of Feedville Road. Note that this alternative replaces some smaller poles with larger transmission towers.

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 Program 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 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 (L_{10} or L_{50}) 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.

Table 5.16-1 Allowable Noise Levels

Statistical Noise Level	Measurement Period	
	7am to 10pm	10pm to 7am
L_{50}	55 dB(A)	50 dB(A)
L_{10}	60 dB(A)	55 dB(A)
L_1	75 dB(A)	60 dB(A)

Source: OAR-340-35-035

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

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

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

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

BONNEVILLE POWER ADMINISTRATION

PUBLIC MEETING

RE: HERMISTON POWER PROJECT

PUBLIC COMMENTS

March 14, 1995

7:00 p.m.

Hermiston Civic/Recreation Center

215 West Orchard

Hermiston, Oregon

PANEL:

Mr. Dennis Oster, Bonneville Power Administration.

Mr. Ed Clark, Ida-West Energy Company.

Mr. Dave Broadfoot, Foster Wheeler Environmental Corporation.

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* * * * * * * * * *

MR. OSTER: If we could ask anyone who wishes to speak to please introduce himself. You don't necessarily have to come up to the podium. Go ahead.

BYRON GROW: My name is Byron Grow. I'm director of Industrial Development for the Port of Umatilla. I represent the partners of the regional water system, which is a part of Umatilla and the City of Hermiston. We have supported and have encouraged Hermiston Power partners to build the plant at Hermiston, and we've entered into agreements with them to supply them water.

HH1-1

At this time, our water project is about 50 percent complete, should be on line by August. And by the time this plant's built, we could provide industrial water from the Columbia River. Thank you.

MR. OSTER: Thank you.

ALLAN LAMBERT: My name is Allan Lambert. I've been a resident in the area for 15 odd years, and I do have some concerns with the project. I'd like to state that I do not have any objections to the power plant itself. Maybe I could borrow this, bring it over here, that I could explain

HH2-1

HH1-1 Comment Noted.

HH2-1 Comment Noted.

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myself a little better. Is that possible?

Where we have some real concerns is within the City of Umatilla on the 230 KV alternate route. I have to admit, I don't understand all of the implications of the 500 KV or 230 KV, what the differences are, I cannot tell you that.

What I can tell you, though, is this line in this vicinity right here runs directly through a mobile home, residential zone and it comes through an incorporated area of the City of Umatilla.

HH2-2

I got the copy of the draft EIS today, so I haven't really had time to read it all. It's quite extensive, but flipping through some of it and the supplement here, the summary, it doesn't really address this situation specifically. The impact to land use is not really addressed.

I realize this only one mile of the 12- or 15-mile project, and that to the overall project may not have a significant impact, but it has an enormous impact to that one-mile piece of land.

I do realize Hermiston Generating Plant is building these poles, and I'm sure this project would take into consideration when them poles were being promoted or provided on that route.

HH2-3

Because of the public hearing process and the

3

HH2-2 The transmission line referred to by the comment is an existing Umatilla Electric Cooperative Association (UECA) double circuit 115/230-kV transmission line constructed for the Hermiston Generating Project. The HPP project will require the conversion of the 115/230-kV line to a 230/230-kV line.

The conversion will only change the insulators and conductors on the western side of the existing poles. No additional poles or circuits will be added. Additional right-of-way is not required to accommodate the improvement. The improvement will not create any additional impacts on adjacent land. That portion of the existing UECA 115/230-kV transmission line within the city limits of the City of Umatilla complies with the applicable substantive criteria from the City's land use regulations.

The conversion of the existing 115/230-kV line to a 230/230-kV line also complies with applicable city standards.

See also response to comment HI1-1.

HH2-3 The displacement of the UECA 115-kV conductors from the existing US Generating/ UECA structures may require construction of a new 115-kV transmission line by UECA to feed several existing switch stations south of the City of Umatilla. The UECA is also looking at alternatives to relocating this 115-kV line, such as installing several 230-kV to 115-kV step down transformers to serve the same loads that this relocated line would serve, in which case, UECA would not reinstall the 115-kV line. If the 115-kV line were reinstalled, it would roughly parallel the 230-kV transmission line within the City of Umatilla Urban Growth Area. In the county, the 115-kV transmission line will follow road rights-of-way.

See also response to comments HI1-1 and HH2-2.

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HH2-3 (cont.)

way it was advertised in the last go-around with Hermiston Generating, we did not get an opportunity to make a comment such as I am now, so I don't want to get confused with the two projects, even though they're tied together.

At I understand, the current project is proposing to use these same structures, but in turn the Umatilla Electric Co-op would have to put their lines back down onto existing or new 55-foot poles that are already there which are currently being removed.

This in itself may be minor, but we would like to see them poles left permanently off the property, and, obviously, if the 230 KV route is selected, that cannot be done. It may be able to. Without more detail than that, I can't explain it.

The smaller lines may be able to be taken down another route that is not totally inconvenient and that would solve some problems. Ultimately, we'd like to see the larger poles that are under construction right now be removed.

HH2-4

I've tried to contact different power companies, and BPA in particular, on burial of that one mile of project, and I've never been able

HH2-4 See response to comment HI1-1

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HH2-4 (cont.)

to get an answer whether it is actually feasible. I've been told it is, but nobody will commit to saying: We can do that on a $300 million project.

I've been told that it would cost about a million dollars extra to bury one mile of that cable. I can see the problems associated with that, but if we could get some consideration from BPA or Hermiston Power Project to consider our problem.

This is over a 400-acre tract of property, residentially zoned, that is almost being totally destroyed, visually and through the EIS. I cannot perceive of building any livable structure within 500 feet of this main line.

I concede this project isn't the sole perpetrator of that problem, but a three to five hundred-foot tract of land we cannot develop on a mile-stretch of roadway is quite significant. It's significant for the City of Umatilla.

HH2-5

I just want to see some alternatives looked at. The land use references in this draft EIS really doesn't address the land uses in this particular instance at all. It doesn't refer, as I could find anywhere, to residential development. There's a few notes here made, but some are

HH2-5 The commentor's remarks address an existing UECA line that currently carries power from another project, the Hermiston Generating Plant. See responses HH2-2 and HH2-6.

The EIS presents two alternatives for conveying power from the HPP project to the McNary substation; the Western 230-kV route which involves using for the most part the existing Umatilla Electric Cooperative Association (UECA) 115/230-kV transmission line; and the Eastern 500-kV alternative, which would involve construction of a new transmission line between the co-generation facility and the McNary substation, mainly using a vacant BPA ROW adjacent to the existing McNary-Roundup 230-kV transmission line.

The EIS presents the land use, visual, and other impacts of each alternative transmission route.

The Western 230-kV alternative would be the least impacting because it would minimize the need for new transmission poles by using existing UECA poles.

See also response to comments HI1-1, HH2-2, and HH2-3.

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HH2-5 (cont.)

relevant, some are not.

The savings -- and it may be somewhat condensed -- it's my belief that the decision is based on what route or the type of transmission that is needed, or can either route be used for the same, or not?

MR. OSTER: The project could be interconnected to the McNary Substation over either route, and a decision has not been made, which is why we've presented both routes as alternatives. So your comments are excellent. We'll have to look at your comments.

ALLAN LAMBERT: On that point, giving it a little nitty-gritty, this route, does that involve a full new construction, the full 500 KV?

MR. OSTER: There is new construction that's required within our existing right-of-way.

ALLAN LAMBERT: But it would require almost 15 miles of new poles?

MR. OSTER: That's correct.

ALLAN LAMBERT: On this route you'll use existing poles that have been built by Umatilla?

MR. OSTER: That's correct.

ALLAN LAMBERT: In that consideration,

HH2-6 I'll make the point by stating: This route,

HH2-6 The 230-kV transmission line referred to is currently under construction. The ownership of that line will be held by the Umatilla Electric Cooperative Association (UECA). It is HPP's understanding that Mr. Lambert and UECA are currently involved in binding arbitration to establish a fair market value for any access impacts for the line crossing his land. This arbitration process is a part of the Cooperative's condemnation process. HPP has no standing in this process and no knowledge of the result of the arbitration hearing.

HH2-6 (cont.)

regardless of whatever reason, Hermiston Power Project would save a considerable amount having to build these new poles. And considering the problems it's creating for us in the City of Umatilla, I assume we can we get some real consideration monetarywise, in an effort to alleviate the problem it's creating for Umatilla and myself personally.

I'm president of a company that's right now in the process of developing almost 400 acres into residential property. That's where my initial problem arises here.

But, anyway, thank you tonight for allowing us to come here to speak. I just wish we'd had the opportunity a year and a half ago. Thank you.

MR. OSTER: Thank you. Are there other comments? No one else wishes to speak?

JER PRATTON: I'm Jer Pratton, superintendent of the school district here in Hermiston, and it seems we're getting pretty used to co-generation plants, so we are a little more savvy than we were a few years ago.

HH3-1

I'd like to speak on behalf of the school district and simply say that without a doubt, on record, that we support the project for, really,

Should BPA select the 230-kV transmission alternative as the preferred route for the Hermiston Power Project, HPP would change out the conductors and insulators on the western side of the poles owned by UECA. At completion of HPP's construction the new 230-kV conductors and insulators will be deeded to UECA. The UECA transmission line will be subject to any and all conditions that are forthcoming from the current Lambert/UECA condemnation arbitration hearings.

Requirements for City of Umatilla building, zoning and conditional use permits are considered during the Oregon Facility Siting Council's site certification process.

HH3-1 Comment Noted.

HH3-1 (cont.)

many reasons. We're a growing area. And where growth is, there's going to come the development of the land in many respects.

I can't imagine a project more beneficial to our area and to the citizens in our state. It's cleaner, it's lower-impact. So we really do support this in terms of what we're looking at.

And, also, from the school district's point of view, very simply, it's going to provide us with the kind of assessed valuation that will certainly be a benefit to our students and our parents in the area. We are growing. We know we're going to need buildings in the future. This modes well for us when we go out for a bonding situation, so we welcome you.

It's the kind of growth I think any right-minded community would welcome. It's a very conservationist point of view, it's a very beneficial point of view, and we stand to benefit and we stand to be ready to be partners with you. So, thank you.

FRANK HARKENRIDER: As mayor of the City of Hermiston, I do support this project 100 percent. With the way this area is growing, we're going to need this power.

HH4-1

HH4-1 Comment Noted.

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HH4-1 (cont.)

I understand this is the Umatilla Electric Co-op's district. With the new distribution center coming up, there will be a big use of power. I'm a hundred percent for this project. Like Jer Pratton said, I'm for it.

The gentleman that just put on the program for the environmental impact statement, about 25 years ago or maybe 20, we started to get the AluMax Plant, which was located down at the Port, and thought we had the project. We got into the environmental impact statement -- I hate to tell that gentleman -- after ten years, the fellow committed suicide.

DAVID HAWK: I'm David Hawk with the JR Simplot Company. I wanted to say with regard to what the Superintendent of Public Instruction of Hermiston said, when he said it would be beneficial to his students and beneficial to their parents, at the same time I would maintain that's beneficial to our employees, who are the very same parents and have the very same students, and would it be very beneficial to our future employees of our businesses here in this community.

HH5-1

MR. OSTER: Thank you.

9

HH5-1 Comment Noted.

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TAMRA MABBOTT: I'll just say something. I'm Tamra Mabbott from the Umatilla Planning Department, and I think I can speak on behalf of a county in general in support of the project. I'm personally put in an unpopular role, being from one of those regulatory agencies, so I have to make sure it's in compliance, particularly with all the land use standards.

HH6-1

To date, they really have demonstrated that. There are a few of these legal interpretation tissues that we're awaiting some clarification on, and we really anticipate that they're simply clarification issues. Other than that, I think it's a great project for the community.

I wanted to make one clarification. When you talk about removing prime farm ground, I think that's primarily next to the existing Simplot site, and that's zoned industrial. So if you're savvy to the land use laws in Oregon, we're not talking about removing land that's owned a view. And that makes the project, you know, even more consistent with the overall comprehensive plan of the county.

HH6-2

DAVID HAWK: Off the record for just a moment.

HH6-1 Comment Noted.

HH6-2 Comment Noted.

(Discussion off the record)

MR. OSTER: Other comments?

(No response)

MR. OSTER: OK. Well, thank you very much. We are taking written comments through April 4th. If anyone would like to talk directly to us, there is a phone number -- There's a form back on the table that has a phone number where you can call. We'd be willing to get together with anyone in the community to discuss issues.

Thank you. We appreciate your coming.

SOLAR VOLTAIC GENERATION LETTER

336 Eric Way
Grants Pass, OR 97526

Saturday, February 25, 1995

RECEIVED BY E
PUBLIC INVOLVEM...
LOG #: R-P-3-53
RECEIPT DATE: 4/10/95
AREA: DISTRICT

Dawn R. Boorse, Environmental Project Manager
Office of Environmental Fish & Wildlife
BONNEVILLE POWER ADMINISTRATION
Post Office Box 3621
Portland, Oregon

Re: RCP-Draft Environmental Impact Statement

Dear Ms. Boorse:

Thank you for the opportunity to review and comment on the above document and action. Through past efforts to get the Solar Voltaic Generation alternative before BPA, my responsive proposal, Solar Voltaic Generation to your "March 1992 Request for Energy Options-The Resource Contingency Program" was not only ignored, at the behest of Angus Duncan, but tagged with ridicule through your Pub.Info. office (Sharon Blair), " a very strange one involving submarines with solar panels cruising up and down the Columbia River." But I am not so easily put off by the Council, by Angus or by those in old RMG that simply ask the Council "How High?".

GI1-1 1. Where are alternatives beyond three gas-fired C-GTs in the EIS-Summary? Is it up to responders, like myself to introduce more affordable, abundant and amicable in the environment alternatives under three proposed alternatives: the proposed action, no action, and other actions? Then well before the April 4, 1995 close of comment you will have an extensive and well documented other actions. I must presume that such formal comment on the draft EIS will appear in the final EIS per your cover material — that is Angus can't veto it.

GI1-2 2. Under Socioeconomics the impact on cost of energy should be discussed for each power plant alternative, C-GTs and Solar Voltaic Generation. Are such factors discussed in the main RCP-EIS along with proposed heat-rates, gross

ELECTRICAL ENERGY DECENCY.....
ABUNDANT AFFORDABLE AMICABLE IN THE ENVIRONMENT ATTAINABLE NEAR-TERM

GI1-1 The Resource Programs EIS published by BPA in 1992 discusses alternative resource types in Chapter 3 and alternative resource acquisitions strategies in Chapter 4. This RCP EIS will not re-examine the overall issues pertaining to different alternative resource types or power acquisition alternatives that were addressed in detail in the Resource Programs EIS. Instead, this EIS will incorporate some of the analyses contained in the Resource Programs EIS by reference, and is consistent with the preferred alternative of emphasize conservation of the Resource Programs EIS. This approach to preparing environmental documents is referred to as "tiering." It is consistent with the Council on Environmental Quality's guidelines for implementing NEPA. Its primary advantage is that it avoids duplication of effort.

GI1-2 The cost of the power will be determined when the need for power has been determined, and these resource options compared to other energy alternatives are considered the cost-effective alternative to fill this need. See Resource Programs EIS p.3-49 and 3-59 for heat rates.

GI1-2 (cont.) annual capacity factor base for emissions, basic fuel-cost of gas projections, and natural-gas reliability. Is there a need for that energy at that location in the BPA system and against what local, temporal marginal costs? Consider rating alternatives against the *Four A's in Energy Decency*. Should I receive a copy of the full EIS?

GI1-3 3. I must question the emission numbers in the draft EIS. First they are sensitive to the expected heat-rate and gross annual capacity factor, neither of which are shown. Moreover, for C-GTs that are on an energy option basis the emission numbers should be stated in tons per aMW of generation. Again there is a temporal basis for emissions and local impact, based on the projected hours and generation levels on line. Do you have generation-duration curves projected for each plant based on the availability of clean-hydroelectric at that location versus the demand-duration curves. The CO_2 emission numbers that I use are from the three Gordon J. MacDonald publications (Items 205-207) in the extensive Solar Voltaic Generation Collection that I contributed to BPA's Library some months ago.

GI1-4 4. As BPA enters the 1995 Rate-Case, are these three C-GTs the offering to acquire more energy and to hold the rates or even lower from the 27 mills priority-firm? Is this new energy and whatever its price in the system held out to offset the considerable cost and short-fall occasioned by Duncan's "Conservation Power Plant"?

Other Actions .....

GI1-5 For a preview of another action response and comment toward April 4th, consider the enclosed for page document, a hand-out at Duncan's Valentine's Day FORUM. It addresses the four logical questions posed in the Council's FORUM announcement. The enclosed "Q-1" sheet has been modified to include the information we heard from Enron at the FORUM. Of course it will be re-formatted in presentation and text to fit the style and items of concern as in your Summary --- toward easy inclusion in your final EIS.

Yours for Strategic Energy Decency,

Alfred H. Canada
(503) 474-4393

GI1-3 Emissions of combustion byproducts are a function of fuel, fuel rate, combustion temperature, altitude, and air flow. The combustion turbine manufacturers have provided the developer with reliable estimates of air pollutants emitted from their engines for different operating conditions. These emissions are presented in detail in the PSD Application for the project (the PSD Application is also presented in the EFSC Application).

The developer has decided to choose a turbine vendor later in the development process and is presenting emissions from four turbines. The air quality analysis uses maximum potential emissions. Emissions for different pollutants are representative of different operating scenarios and the different turbines. NO_x emissions would increase with increasing load and temperature. NO_x emissions were based on full load conditions. CO emissions would decrease with increasing temperature. Maximum CO emissions were estimated at 60 percent load conditions. SO_2 emissions increase with increased sulfur content of the fuel.

The use of the auxiliary boiler proposed for HPP would increase project emissions, but may offset other emissions from the Simplot plant boiler. The HRSG would increase the efficiency of the turbine while decreasing the emissions per MW generated. The use of fuel oil (used only during an interruption in flow of natural gas) would generally increase the emission rates of all pollutants.

With future operational changes being planned for the hydroelectric system to protect fisheries resources and with technological advances in combustion turbine design uncertain at this time, generation-duration curves for each project are impractical at this time. However, this EIS assumes a worst case analysis that these plants would operate in a full year base-load mode and analyzes pollution emission figures that can be met with today's technology. In reality, all available hydroelectric power would be used to meet load requirements before these thermal plants would be considered. In addition, one of the inherent advantages of combustion-turbines is the flexibility they offer to meet seasonal or peak demand needs.

GI1-4 There has been no decision to build or purchase the output of these projects, and therefore, no funding has been allocated for their acquisition in the 1995 or 1996 Rate Cases. When and if BPA determines a need for power, BPA will analyze competitive bids submitted by the resource developers for these projects as well as from other potential energy sources and determine how to best cost-effectively meet load requirements.

GI1-5 Comment noted.

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG #: RCP-3-61
RECEIPT DATE:
4/13/95
AREA DISTRICT

Friday, April 07, 1995

S
SOLAR
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TION
LETTER

336
Eric Way
Grants
Pass, OR
97526

Dawn R. Boorse
Environmental Project Manager
BONNEVILLE POWER ADMINISTRATION
Post Office Box 3621
Portland, Oregon 97208

Subject: Revised Comments on RCP-EIS

Dear Ms. Boorse:

Please substitute this slightly revised "Comment on the RCP-EIS", dated April 7, 1995, for the April 4 version that must have gotten to your office yesterday by UPS-Overnight. I see by the item at the top of last page "Public Involvement" in the Journal for April '95 that *"the close of comment on the draft EIS has been extended to April 20"* ----- plenty of time for regular mail today.

That also provides time for me to provide a copy to several others that may be persuaded to comment on these SVG comments. A copy to the Council may cause some trauma, with perhaps a comment and surely Angus politicking to bring NEPA under their control to continue avoidance of strategic solar voltaic generation power plant ***Energy Decency***.

GI1-6

The changes are a few spelling gaffes, additions to the "Literature Cited" and added information in the "Summary Table". As this document reaches its entitled inclusion in the final RCP-EIS, I would welcome comments and editing to help the case for solar photovoltaics. Perhaps there will be a public meeting to thrash out the *no action* and *other action* determination. Doug Auburg and Dennis Oster never would permit a meeting to question, critique, or discuss the SVG power plant, not even view the full-scale prototype. Recently, they even returned all four boxes of the extensive Photovoltaics Library that I contributed to BPA about a year ago.

ELECTRICAL ENERGY DECENCY.....
ABUNDANT AFFORDABLE AMICABLE IN THE ENVIRONMENT ATTAINABLE NEAR-TERM

7-18

GI1-6 Comment noted. Three public scoping meetings where held on the project in October 1993, and three public comment meetings were held in March 1995 on the Draft EIS.

GI1-7 Yet, hands-down, strategic solar voltaic generation has arrived and surpasses CCCTs and CPPs and as suggested in the latest PVNEWS copy enclosed from Paul Maycock. Of course the old "RMG gang" may fix on the "$33, 940 per kW-inc" project in UPVG —— except that Amoco/Enron/Solarex are delivering the goods, offering 150 MW-inc pv-plants in Nevada, China and India; the later with Hazel O'leary's help. Would that Hazel or our Christine would shed a little charity starts at home on our BPA.

GI1-7 Comment noted.

GI1-8 There should be an EIS that includes Angus' "Conservation Power Plant" and BPA's dear commitment impacting our rates. As shown in a beginning Table the *Conservation Power Plant projects, 1500 aMW* is neither the least-cost resource nor the most benign. Is the "Business Plan Supplemental EIS" the first step in a CPP-EIS? If so please supply a copy.

GI1-8 Comment noted.

GI1-9 Just as solar and hydro complement one another, there is added synergism in planting wind-turbines dispersed in a large SVG project. With the right BPA engineering, the thin-shadow and guy-wired towers merely plug into the low-voltage bus that is already in place for SVG. From the svg-farmer's point of view it is cleaner than smudge-pots and may drive away the birds from his crop.

GI1-9 Comment noted.

GI1-10 BPA should be the electricity supplier of choice for the Pacific Northwest. With the SVG approach that has been before the Council, ignored, since early 1991 and twice proposed and rejected by BPA, BPA could take the lead in this energy decency. BPA's method of resource acquisition and financing could cause the incremental-growth SVG 1026 aMW Project. Worldwide pv-module manufacturers will flock to sell energy at the BPA standard power/scada interface at considerably less that 20 mills. If BPA revenues are paying the interest on the $160/kW borrowed to build the svg-plant, say at 10% then BPA need add only 9 mills on the 1752 kWhs or so to keep up with the interest. Share-crop lease and adders on the wind-power-electricity are gravy.

GI1-10 Comment noted.

GI1-11 On the other hand, some of your customers could build their own svg-plants and simply treat the BPA-system like a big storage battery. Some of them are already talking to me about svg-plants and Amoco/Enron has been scouting the neighborhood. It needn't be, but their doing a turn-key plant by an A&E like Ebasco or the new hat assumed by Amoco/Enron must build a power plant for a financial-life with all of the fees, like 20% FCR and 10% engineering-management, tacked on to the plant cost that in most cases includes the plant manufacturers own private pv-modules. That is why the high cost per installed

GI1-11 Comment noted.

GI1-11 (cont.) kW of capacity in some of the UPVG responses. The low-cost SVG generic-plant concept made it to Enron many months ago. I am told by Paul Maycock that the Enron approach closely follows the SVG model even to allowing a choice of who's pv-modules to plug in. The point is that any distribution engineer is already well versed in all that is needed to design and engineer an svg-plant. BPA superior experience in acquiring and moving electrical energy ***and your firm grip on the storage battery*** gives BPA an uncommon edge to be the electricity supplier of choice and economy for the next century. **Do it. Don't let nay-sayers like Oster and Auburg and an overly ambitions Angus Duncan crab this act. Our future and my *socioeconomic* well-being depends on you.**

GI1-12

Yours for Strategic Solar Energy Decency,

Alfred H. Canada
(503) 474-4393

GI1-12 Comment noted.

...OVEMENT
RCP-3-6D
...IPT DATE:
4/13/95
AREA: DISTRICT

Saturday, April 08, 1995

George Dana
Dawn Boorse - ECN. 15-C

S
SOLAR
V
VOLTAIC
G
GENERATION LETTER

336
Eric Way
Grants
Pass, OR
97526

C. Douglas Auburg *et al* in RMG
BONNEVILLE POWER ADMINISTRATION
Post Office Box 3621
Portland, OR 97208-3621

Dear Doug:

GI1-13

Look closely, no way can the enclosed be viewed as ***submarines with solar panels cruising the Columbia.*** Your own, Butler's or Duncan's other favorite for brush-ing off consideration of strategic solar voltaic generation now appears curious on the following from your BPA/RCP-draft EIS of 2/95; *"Instead of buying or build-ing generating plants now, BPA has purchased options to acquire power later, if and when needed."* This *other action* that must appear in the final EIS with com-ment and analysis, presumably by Ebasco, offers so much more for our BPA's fu-ture than CCCTs operating at an annual capacity factor of 95% !! Projects built by the Corps or better the Bureau since extensive land-management is involved, add less than a cent to the ***energy-option*** price that you and some of your customers can obtain from IPPs desirous of placing their svg-unit generator modules in the project. Don't duck this as "no authorization for fundamental research", which it is not. Nor is it fundamental research to draw up engineering plans and specifica-tions for plant, power/scada interface, solar/hydrographic operational planning at Dittmer, or Amplidiyne generator/motor wind-turbines for plug-in dispersal into likely SVG Projects.

If RMG gets its head out of the sand or off the Council's ass you may wish to give engineering consideration to implementing the SVG Project *other action*. No, I didn't burn-the-books returned recently. The ***Photovoltaics Library***, now residing in the Canada barn, is still available to our BPA.

Yours for strategic solar energy decency at BPA,

Alfred H. Canada

ELECTRICAL ENERGY DECENCY.....
ABUNDANT AFFORDABLE AMICABLE IN THE ENVIRONMENT ATTAINABLE NEAR-TERM

GI1-13 Comment noted.

Attachment to Comment GI1-13

Other Action: Solar Voltaic Generation Project RCP- EIS (2/95)

Introduction

At Issue: Other Action Alternative In the EIS

GI1-14 **Solar Voltaic Generation** projects can supply BPA with **up to 1026** aMW of electric energy with little or no environmental impact beyond that of the electric transmission; at energy costs comparable to or lower than the current BPA firm priority rate. The no action alternative should be taken on the NEPA-EIS proposed natural-gas-and-oil-fired Combined Cycle **Combustion Turbine** projects to provide **up to 1090** aMW. Implement the other action alternative; with one or more Solar Voltaic Generation power plants to provide up to 1026 aMW in the same time period. The SVG projects are expandable to provide all or most of the additional electrical energy needs in the system for most of the 21st Century. A combined hydro/solar resource can remove the need for BPA to pursue Council's *Conservation Power Plant* resource to conserve 1500 aMW by year 2000; hardly a cost-effective resource at an estimated cost of 13¢/kWh. Solar photovoltaic electrical energy added to the daily/hourly hydrosystem operation can accommodate water releases for *fisheries* enhancements with a minimum sacrifices of hydroelectric energy.

RCP-EIS Background

BPA has responsibilities to supply electric power to local utilities, industries, business and other customers in the Pacific Northwest. As electric power use grows, BPA studies different kinds of resources to supply power. BPA is committed to acquiring cost-effective conservation, but conservation alone cannot meet the projected demand for electricity in the Northwest.

GI1-15 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 generation plants now, BPA has purchased options to acquire power later", if and when it is needed. This Environmental Impact Statement (EIS) addresses the environmental consequences of purchasing power from these options, three proposed natural-gas fired, Combined Cycle Combustion Turbine (CCCT) projects that could supply BPA with up to 1,090 average megawatts (aMW) of firm energy; locations, installed-nameplate-capacity, and capacity-factors; being near Chehalis, WA (456 aMW, 478 MW-inc, 95.4%), Hermiston, OR (430 aMW, -ng- MW-inc, -ng-%) and Stasop, WA (207 aMW, 234 MW-inc, 88.5%) (ng, not given).

RCP, Solar Voltaic Generation Background

GI1-16 In May 1992, BPA issued an RCP solicitation. In response to BPA's request for energy options, 64 proposals were submitted totaling 7,842 aMW of energy; with one an up to 800 aMW from Solar Voltaic Generation projects proposed in distributed generation at best *solar-fuel* locations throughout the region. While the proposed projects were to be evaluated

GI1-14 For a discussion of solar energy supply and price forecast please refer to section 3.3.1.4 of the Resource Programs EIS.

GI1-15 Comment noted.

GI1-16 Comment noted.

GI1-16 (cont.)

against the RCP goals of *project viability*, *cost-effectiveness*, and *minimal environmental impacts*, the solar photovoltaic project proposal was suppressed; apparently without such evaluation, with *"BPA agrees with the Council that solar has uncertainties which preclude it from being considered a reliable cost-effective resource at this time. For this reason it was not included in our request for energy options."* (BPA-RMG, 6/30/92)

Conclusions and Actions

The EIS considers three alternatives: the proposed action, no action and **other action**. BPA also is considering taking no action. In this alternative, BPA would not acquire energy from the proposed projects. Since the **proposed action** may satisfy only part of BPA's power needs, if taken, **other actions** for resources will be considered independent of the proposed action. Based on the technical analyses summarized in the Draft RCP-EIS and the Solar Voltaic Generation project descriptions, the salient features of three resources available to the Pacific Northwest are shown in a Summary Table, evaluated against *minimal environmental impact, project viability and cost-effectiveness.* Upon the evidence the EIS should implement:-

GI1-17

The NO ACTION alternative on the proposed Combined Cycle Combustion Turbine projects,

The OTHER ACTION alternative to undertake Solar Voltaic Generation projects, and incremental expansion to offset any transitory Conservation Resource energy savings,

The EIS on the CONSERVATION RESOURCE to enable consideration of the socioeconomic impacts and the induced fuel-switching to polluting-fuels.

Alfred H. Canada, Grants Pass, Oregon

GI1-17 Comment noted.

Allan and Angella Lambert
P.O.Box 1095
Umatilla, OR 97882
phone & fax 503-567-9999

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG #Herm-1-64
RECEIPT DATE:
4/20/95
AREA: DISTRICT

April 14, 1995

Public Involvement Manager
Bonneville Power Administration
P.O.Box 12999
Portland, OR 97232

RE: comments regarding Draft EIS for HPP/Ida-West project

Dear Sir/Madame,

Please include all of the enclosed information as comments regarding the Draft EIS for HPP/Ida-West Project.

Sincerely,

Allan J. Lambert

Allan J. Lambert

Angella Lambert

Angella Lambert

Allan & Angella Lambert
Phil & Marianne Brown
P.O.Box 1095
Umatilla, OR 97882
phone 503-567-9999
fax 503-567-9999

March 28, 1995

Mr. Ed Clark
Ida-West Energy Co.
P.O.Box 7867
Boise, ID 83707

RE: Transmission Lines, City of Umatilla

Dear Mr. Clark,

In response to our phone conversation last week, we ask for your help in this matter.

I have enclosed maps and a copy of the letter we sent to Rep. Chuck Norris. This briefly outlines the problems associated with these lines that your company is part of.

Regarding Rep. Chuck Norris's letter, no response has come back from U.E.C.A. to us except a Condemnation Lawsuit.

Construction of the large poles and the lower U.E.C.A. lines is taking place at this time.

We realize that changes may not be initially accepted and that Ida-West Energy may not have created this problem for the City of Umatilla and/or the property owners.

We also acknowledge that Ida-West Energy current request is to "only use existing poles and easements".

Ida-West Energy as the applicant for these new additional transmission lines, can rectify through an ammended application help resolve the problems and past mistakes.

HI1-1 We propose the Ida-West Energy request a change in the 230 kv route that would allow new poles be erected from the corner located 1/2 mile South of the BPA easement between section 24 & 19, to run directly North to the BPA Easement and then East along side the BPA easement.

7-26

HI1-1 Energy from the HPP would be delivered from Westland Substation to a point within 0.4 km (1/4 mile) of BPA's McNary Substation on new conductors replacing UECA conductors on double-circuit 115/230-kV structures to be erected for the Hermiston Generating Project at the Lamb-Weston potato processing plant adjacent to Westland substation. The proposed activities simply consist of replacing the UECA 115-kV conductors and insulators with 230-kV conductors and insulators using the same poles.

Construction of the 115/230-kV transmission line is ongoing and was required as a result of the Hermiston Generating Project (by U.S. Generating). This transmission line interconnection was evaluated in BPA's Hermiston Generating Project EIS, (DOE/EIS-0204 July 1994) as well as in a Site Certificate Application to the Oregon Energy Facility Siting Council and the Oregon Department of Energy. Site Certification for the Hermiston Generating Project (and transmission line) was granted March 11, 1994.

Thus, the UECA transmision line structures transmitting the Hermiston Generating Company's power would have been built regardless of whether the proposed Hermiston Power Project is constructed or not.

To demolish and remove and relocate that portion of the 230-kV line proposed by the commentor would cost over $2 million dollars.

It has been suggested by the commentor that undergrounding of the lines be considered as an alternative to relocation of the UECA lines. This too would involve demolishing and removing existing structures. The cost of undergrounding would be 3 to 5 times the cost of overhead construction. Also the undergrounding ofa 230-kV line would require the use of high-pressure fluid-filled pipe (HPFF) technology rather than solid diaelectric cables.

Fluid pressurization and possibly cooling stations would be required. Because the cable would be filled with diaelectric fluid for insulation and cooling, a rupture in the pipe system could result in fluid leakage. The fluid handling equipment of an HPFF system requires significantly more maintenance and attention than an overhead line. In addition, because of the difficulty of locating faults in an underground cable, repair of outages require time-consuming and expensive trenching and fault repair can take days rather than hours.

It would be difficult to justify placing the burden of substantial additional cost on the Hermiston Power Project to demolish and relocate the now existing UECA 115/230-kV transmission line for which HPP is requesting wheeling of power to the McNary substation.

HI1-1 (cont.)

If the Ida-West Plant were to be approved with this done, an arrangement would be needed with U.E.C.A. and Hermiston Generating to ensure that they then transfer their lines from the existing Hermiston Generating poles to the new Ida-West poles and easement.

Removal of the Hermiston Generating poles and lines through the affected property could then take place. Such an undertaking would resolve 90% and more of the negative impact of what is now taking place.

No more lawsuits or destruction of property.

Hermiston Generating, U.E.C.A. and now Ida-West combined will pay in excess of $700 million for these power plants. These poles/transmission lines as they exist now will become a permanent blight for the City of Umatilla..

We do not believe that U.E.C.A., Hermiston Generating or Ida-West should be offering us as landowners any monetary amount and condemning this section of property unless all possible alternatives to save this property have been fully considered.

Furthermore we offer the above proposal with the hope that the co-operation of all parties can alleviate the permanent destruction of the zoned use of this property. We feel that Ida-West has the ability, with the co-operation of Hermiston Generating and U.E.C.A. to do this.

This property represents 1/3 of the City of Umatilla's incorporated area.

We ask for your serious consideration of this matter.

Sincerely,

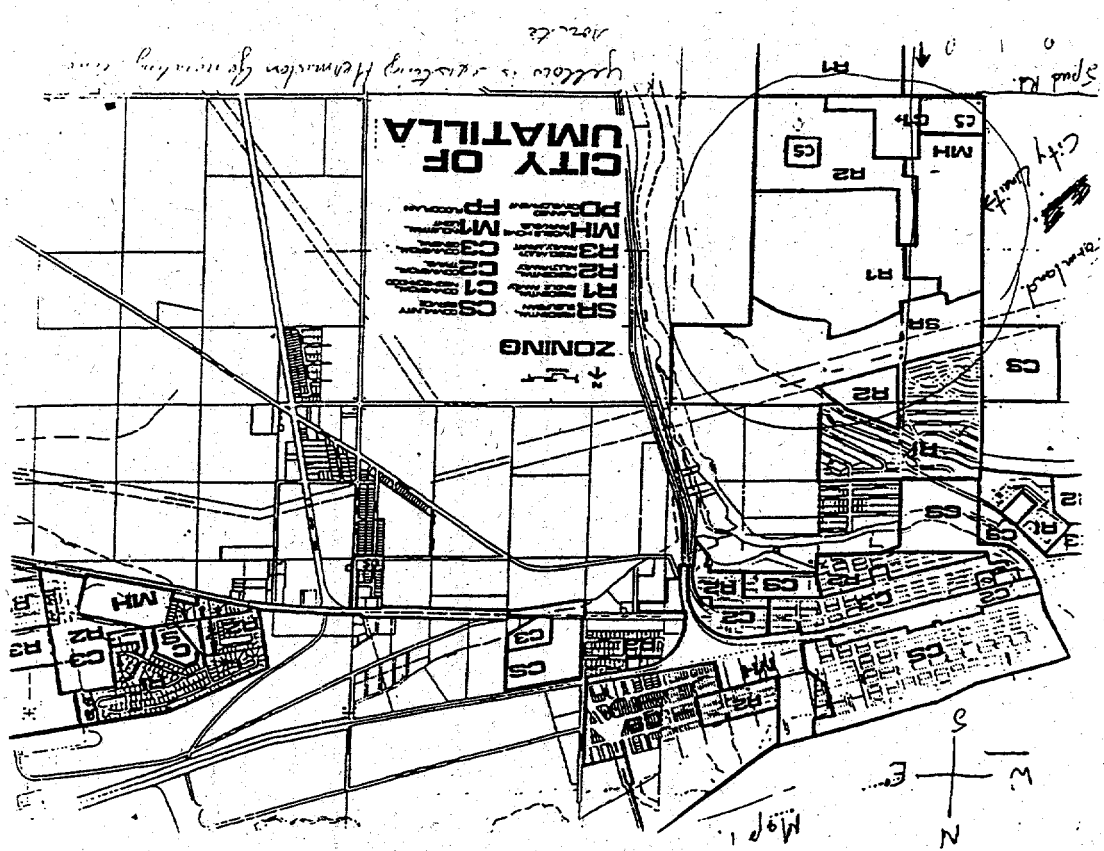
Allan J. Lambert

Angella Lambert

Phil Brown

Marianne Brown

cc: Dept. of Energy, Energy Facility Siting Council, Adam Bless
BPA, Julie Pifer
Sen Gordon Smith
Rep. Chuck Norris
City of Umatilla, Mayor, City Council
Umatilla County Planning Dept., Tamara Mabbot
City of Hermiston, Mayor Frank Harkenrider


CITY OF
UMATILLA
ZONING
SR
R1
R2
R3
C1
C2
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MH
MP
PD
FP
Map 1
N
S
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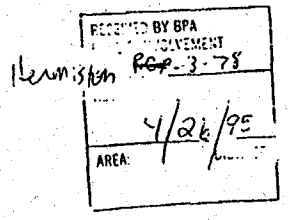
1702 Bryant Avenue
Walla Walla, WA 99362
April 19, 1995



Dawn R. Boorse
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208-3621

Dear Ms. Boorse:

I recently received the letter dated March 22, 1995, RE: Opportunity to Review RCP Draft, you sent to my mother, Laura Buck DePietro. She sent it to me, asking that I reply in her behalf.

After visiting with you on the telephone and reviewing the information that you faxed to me, it is still not clear to me the extent of the impact this project will have on my mother's property and property owned by Buck's Consumer Supply, Inc., in that area. My mother is President of Buck's Consumer Supply, Inc., and is the majority stockholder.

HI2-1 What I can say for sure is that mother and I would object to any portion of the project that would devalue her property or property owned by Buck's Consumer Supply, Inc. in any way, create a health hazard, obstruct view (she is on a view lot overlooking the Columbia River), limit property use, or in any way diminish or limit use of these properties.

We request that our individual situation be addressed regarding the above issues and that comment be made to each concern. We want to be assured that these properties will not be negatively impacted as described above or in any other way. If adequate and reasonable assurance cannot be provided, your means of compensating for financial loss should also be discussed.

Thank you.

Sincerely,

Laura Nielson

Laura L. Nielson

HI2-1 The comment addresses four areas of concern, related to the commentor's lands and the proposed relocation of approximately 1 mile of the existing BPA 500-kV McNary-Lower Monumental transmission line circuit to new single shaft tubular steel poles within Umatilla County Road 623 right-of-way. The relocated BPA line would be approximately 183 m (600 feet) east of its present location. The required HPP conductors would then take the present position of the BPA McNary-Lower Monumental circuit on the exiting BPA transmission line structures.

The four areas of concern are: property devaluation, health hazards from the transmission line, obstruction of views from commentor's property to the Columbia River and limits on property use under or near the transmission line. Each concern is addressed separately.

Property Devaluation

The relocation of the 500-kV transmission line would be within an existing county road right-of-way to US Route 730. The outer edge of the tubular steel poles would be set back approximately 0.61 m (2 feet) from the county road right-of-way boundary. The conductors would be suspended on davit arms over the county roadway. (See Figure 2-8 in the FEIS, Proposed Transmission Line Pole Design - 500-kV Eastern Alternative.)

Upon crossing US Route 730 the transmission line would occupy right-of-way within lands owned by US Army Corp of Engineers and BPA to the McNary Substation. No new easements from private landowners would be required for the new transmission line route.

Several studies have been conducted throughout the United States and Canada to identify the impact of overhead electrical transmission lines on property values. The Effects of Overhead Transmission Lines on Property Values (July, 1992), prepared for the Edison Electric Institute Siting and Environmental Planning Task Force by Cynthia A. Kroll and Thomas Priestley, reviews and summarizes several research projects conducted over the previous 15-year period. Three of the studies occurred within the BPA region. A 1985 study in Western Montana, of suburban and rural residential property (both improved and unimproved), referencing a 230-kV line and a proposed 500-kV line, concluded that no adjustment to market price was necessary for properties encumbered by or in view of the line. A 1990 study in Western Montana, of suburban and rural residential property, and referencing a 500-kV line, analyzed interviews with 400 residents. Fifty percent of those residents living within almost 1 mile of a 500-kV line felt there was a negative effect on property value, while on 5 percent of the residents living within 1.61 to 4.83 km (1 to 3 miles) from the line felt there was a negative effect on property value. A 1983 study along the Oregon/Idaho border of agricultural grazing land, referencing a 500-kV line, concluded that value was affected only by the amount of land removed by towers and roads; and that owners perceive effects if a potential exists for residential use or if lines disrupt irrigation. BPA is currently conducting

a study on the impact of overhead transmission lines on property value in the Portland, Oregon and Seattle, Washington metropolitan areas. After the raw data is verified, reviewed, and statistically analyzed, the study results will be published (Summer/Fall 1995). We are not aware of any other studies that have taken place in the immediate project area.

Health Effects and Transmission Lines

In recent years, interest and concern has grown with regard to potential effects associated with electric and magnetic fields in the vicinity of electric power transmission lines.

Power lines, like all electrical devices and equipment, produce electric and magnetic fields or EMFs. Voltage (the force that drives the current) is the source of the electric field. Current (the 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 the distance from the line. Field strength decreases rapidly with distance.

EMFs 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 (for an electric blanket) and higher can be found very close to electrical appliances. Typical electric and magnetic field strengths for some common electrical appliances are shown in Table 3.11-1 in the FEIS.

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. Magnetic fields associated with appliances range from 1.5 mG for a coffee maker to as much as 100 mG for an electric blanket. The magnetic field near an appliance decreases rapidly with distance from the device. Magnetic fields also decrease from line sources, such as transmission lines, but not as rapidly as appliances.

Table 3.11.2 in the FEIS shows typical electric and magnetic field strengths from BPA transmission lines. For a 500-kV line the electric field at the edge of the ROW is approximately 0.3 kV/m, and the magnetic field averages 30 mG.

There are no national or federal standards in the United States for electric or magnetic fields. The State of Oregon has a standard for electric fields of 9 kV/m at the edge of the ROW but no standard for magnetic fields. The proposed 500-kV line will meet Oregon's electric field standard.

The magnetic field of the proposed 500-kV single pole/single circuit line was estimated using industry accepted computer modeling techniques as presented in Section 4.11.3, and illustrated in Figure 4.11.5 of the FEIS. The modeled results showed a maximum 60 mG at the center of the ROW, decreasing rapidly to 20 mG, 100 feet from the center line of the ROW.

A number of studies in the 1960s and early 1970s found no obvious harmful effects from typical transmission line electric and magnetic fields. Some studies during this period did report the potential for harmful effects. More recent reports have suggested a possible association between occupational and residential exposure to magnetic fields and adverse health effects. Most scientific reviews, however, find the evidence too weak to establish a cause and effect relationship between electric and magnetic fields and health risks. Studies are continuing to obtain more definitive information on the subject. A review of some of the studies related to electric and magnetic fields and possible biological and health effects is included as Appendix D in the DEIS.

Bonneville Power Administration has also published a document entitled *Electrical and Biological Effects of Transmission Lines: A Review* which discusses the worldwide research on EMF. Two other documents published by BPA that discuss the EMF issue are *What We Know and Don't Know About EMF* and *Electrical Power Lines: Questions and Answers on Research into Health Effects*. These documents are available from BPA on request by calling 1-800-622-4520.

Electrical fields dissipate when they encounter vegetation or structures; magnetic fields do not. Therefore, recent health concerns relating to EMF have mainly focused on magnetic fields. Because public concern is increasing over potential health effects of EMF, and because a clear course of action still cannot be determined from present scientific evidence, BPA has developed interim guidelines on EMF. HPP is using BPA's guidelines to keep EMF exposures as low as are reasonably achievable, considering social, economic, and environmental factors. The Oregon Energy Facility Siting Council, in adopting the March 1993 Report of the EMF Committee concluded that it was premature to set "Health Based" limits for exposure to EMF. Furthermore, they encouraged the exploration of low cost ways to reduce or manage EMF exposure. In light of these considerations, HPP has included EMF reduction in its design philosophy for the project.

HPP has consciously designed the lines to reduce ground EMF levels. The planned vertical arrangement of the transmission line conductors exhibit significantly less electrical and magnetic field impact at ground level than the more common horizontally arranged conductors. The vertical design achieves a partial EMF cancelling effect.

Obstruction of Views

The rerouted McNary-Lower Monumental 500-kV transmission line as it crosses U.S. Route 730 would be located to the east and parallel to the DePietro residence as it proceeds in a northerly direction, crossing the railroad tracks before turning west into the McNary Substation.

The transmission line structures would be single shaft tubular steel, approximately 127 feet high. The distance from the DePietro residence to the point where the transmission turns west into the McNarysubstation is approximately 610 m (2,000

feet). In this segment approximately 3 transmission poles would be installed (based on average span length of 198 to 244 m (650 ft. to 800 ft.).

The transmission line segment, roughly perpendicular to the railroad tracks to the McNary Substation is approximately 244 m (800 feet) in length, requiring perhaps one pole before terminating in the substation. The conductor (or wire) height above the ground at the maximum point of sage would be 18.3 to 22.9 m (60 to 75 feet). The approximate elevation change from the DePietro residence, which is situated on a bluff downslope to the McNary substation is approximately 42.7 m (140 feet).

Visual impact of the relocated transmission line segment perpendicular to the railroad tracks and the Columbia River view from the DePietro residence would be low to moderate because although the Columbia River is over 1.6 km (1 mile) from the residence (a background view), and few poles would be installed, portions of the conductors would be within the line of sight from the residence to the river.

The landscape character surrounding the DePietro residence is generally not intact. The existing landscape condition contains a number of major and minor disturbances including several existing BPA high voltage transmission lines, a railroad, the McNary Substation complex, and a network of access roads and highways. These disturbances have disrupted the landscape unity.

The addition of a new 500-kV line into the landscape would result in a low but long-term additive impact on the views from the DePietro residence.

The impact of the new line on views is considered low because of the number of existing transmission lines near the new route that converge on the McNary Substation.

Limitations on Property Use

Land uses within the right-of-way are limited to those which do not interfere with the safe operation and maintenance of the line as defined by the National Electric Safety Code (NESC). For instance, no buildings or other structures may be built within the right-of-way and no flammable materials may be stored there.

Land owners can still use the right-of-way for grazing and agriculture as long as it does not interfere with the safe operation and maintenance of the line. Future use of lands that lie adjacent to the right-of-way are not restricted or limited except for the planting of trees whose mature crowns may extend into the right-of-way.

The relocated BPA 500-kV Lower Monumental to McNary transmission line in the area of concern to the commentor would be located partially within the Umatilla City Limits and entirely within the City of Umatilla Urban Growth Area (UGA).

Umatilla County has land use jurisdiction within the City of Umatilla's UGA in accordance with the Joint Management Agreement (JMA) between the City and County dated January 25, 1978. Within the City UGA, the 500-kV transmission

line will be constructed within the existing BPA right-of-way South of Diagonal Road (Power City Road), where it intercepts BPA's existing 500-kV McNary - Lower Monumental transmission line. The HPP project 500-kV electrical transmission line will occupy the existing 500-kV structures North of Diagonal Road into McNary Substation, while the McNary - Lower Monumental transmission line, which presently occupies those structures, will be relocated to a new corridor paralleling Lind Road, (County Road 623).

The City of Umatilla County JMA requires the county to adopt and incorporate the City zoning ordinance provisions for application in the UGA.

Current City zoning within the area of concern consists of five zoning designations:

C-1 General Commercial

C-S Community Services

F-1 Exclusive Use Farm Zone

F-2 General Rural Zone

M-1 Light Industrial Zone

C-1 General Commercial

Current land use within the General Commercial zone to the east of the County road right-of-way is open lands. In a C-1 zone a "utility facility" is a permitted conditional use subject to approval and issuance of a zoning permit.

C-S Community Services

Current land use within the Community Service zone to the west of the County road right-of-way at its intersection with U.S. Route 730 is a water tower.

In a C-S zone a "power substation or other public utility building or use is a conditional permitted use subject to approval and issuance of a zoning permit."

F-1 Exclusive Farm Zone

Current land use within this zone to the North of U.S. Route 730 consists of pasture and the Buck-DePietro dwelling.

In an F-1 zone "utility facilities necessary for public service except commercial facilities for the purpose of generating power for public use by sale" is a permitted use per Section 3.012 of the Umatilla County Zoning Ordnance.

The transmission line is a utility facility necessary for public service and does not generate power for public use by sale.

F-2 General Rural Zone

Current land use within this zone on either side of the County road right-of-way is

primarily pasture, with the exception of a retail establishment at the intersection of US Route 730 and County Road 623.

In an F-2 zone, the transmission line is a "utility facility" permitted as a conditional use in accordance with UCAO Section 3.024.

M-1 Light Industrial Zone

Current land use within this zone on the east of the county road right-of-way is public storage buildings.

In an M-1 zone, the transmission line is a "utility facility" permitted as a conditional use in accordance with UCAD Section 3.136.

The relocated BPA 500-kV Lower Monumental to McNary transmission line along County Road 623 and crossing U.S. Route 730 through DePietro property is a permitted or conditional permitted use according to the City of Umatilla zoning ordinance.

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG #: HERM--73
RECEIPT DATE: 4/21/95
AREA: DISTRICT

John Williams
12770 SW Foothill Dr.
Portland, Ore. 97225
503-626-5736 fax-503-641-2093
April 19, 1995

BPA
Dawn Boorse
Portland, ORE by FAX and mail

Dear Ms. Boorse:

I am a researcher for Plumbers and steamfitters Local #342. The Local has many current, former and retired members who live and work in and near the vicinity of the proposed BPA power plants, specifically the Hermiston facility.

Here are the Local's comments on the BPA contingency plan and the Hermiston plant. Please send me copies of all comments received by BPA on the DEIS for these projects.

Thank you for your past and future cooperation

Yours, John Williams

cc: Doyle Williams, UA #342
Attorney Linda Williams

Here are comments from Plumbers Local #342 regarding the BPA's Resource Contingency Plan. Local #342's comments solely evaluated the impacts from construction of a natural gas fired power plant in Hermiston, Oregon, although the Local's general concerns may be applicable to the other projects under consideration.

GENERAL CONCERNS

GO1-1a-d The DEIS was inadequate in that it failed to provide many necessary details about the precise environmental and socio-economic impacts. There is conflicting or unavailable information about many specific prospective amounts of air and water pollution from these facilities, there were no comparisons of air and water pollution prevention measures at the proposed facilities, with other operating or recently proposed/permitted power plants, and there was no comprehensive presentation of alternative designs of these proposed power plants.

GO1-2 The last factor is especially critical. Discussion of alternatives is the "heart" of the NEPA process. But this DEIS did not, for instance, discuss an air-cooled project alternative design for the project, even though water use and pollution is a vitally significant issue.

GO1-3 Nor did the DEIS compare alternative designs for the air pollution control systems for these projects. For instance the DEIS did not adequately discuss the merits and drawbacks of low-NOx burners, selective catalytic reduction, thermal oxidation, non-selective catalytic reduction, baghouses, combustion controls, and other alternative pollution controls for these facilities.

SAFETY

GO1-4a The Hermiston project will need a new natural gas pipeline that will run in and near populated areas. But the EIS did not discuss natural gas pipeline accidents, also known as "service incidents."

GO1-4b A service incident is reportable if there is a gas leak causing a death or serious injury, gas ignition, over $5000 in property damage, if it occurred during a test, if it required immediate repair, or if a portion of the line was taken out of service because of the incident.

GO1-4c The EIS should describe the likely scenario of service incidents on the pipelines serving these power plants, perhaps by describing several recent service incidents at similar pipelines.

GO1-4d Descriptions of a range of several recent incidents should be provided in the FEIS, so that readers and commentors can be

GO1-a &1-b Comments noted. The comments do not provide specifics regarding "necessary details and conflicting or unavailable information" to enable a focused response.

GO1-1c The emission controls proposed for the Hermiston Power Project (HPP) meet or exceed current Best Available Control Technology (BACT). ODEQ requires the application of the BACT for control of each regulated pollutant emitted above significant emission rates from a new or modified stationary source (more than 100 tons per year of any one pollutant from a combined cycle cogeneration facility).

The BACT requirements are intended to ensure that a proposed facility will incorporate control systems that reflect the latest technology used in a particular industry. The BACT evaluation requires the documentation of performance levels achievable for each air pollution control technology applicable to a natural gas-fired combined cycle cogeneration facility.

HPP in its PSD application to the Oregon Department of Environmental Quality submitted on August 3, 1994 included a comprehensive BACT analysis, employing USEPA and ODEQ's recommended top-down approach to the evaluation of available air pollution controls. This approach to the BACT process involves determining the most stringent control available (LAER) for similar or identical emission sources.

It involved a five-step process which:

1) Identified all available control options within practical potential for application to the emission unit and the regulated pollutant under evaluation.
2) Eliminated technically infeasible options.
3) Ranked remaining control technologies by control effectiveness.
4) Evaluated most effective controls.
5) Selected the BACT which is the most effective option not rejected based on energy, environmental and economic impacts.

With respect to water pollution prevention, the HPP cogeneration facility has been designed so its wastewater can be used for irrigation. The cogeneration wastewater will 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.

As stated in the FEIS, Section 4.2 Water Resources, a study by Cascade Earth Services 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. Land application of HPP cogeneration plant wastewater is unique to the project and not comparable to other recently permitted facilities such as the Tenaska Washington II Generation Project where power plant wastewater would be discharged to a municipal sewage treatment system and the Hermiston Generating Project by U.S. Generating Company where wastewater is evaporated to produce a solid sludge that is disposed of in a landfill.

Other features incorporated into the HPP plant to reduce wastewater, manage storm water runoff, and handle solid waste disposal include:

- Multi-media filter backwash water is recovered by recycling this stream to the clarifier for suspended solids removal.
- Filtrate from the sludge dewatering system is returned to the clarifier for reprocessing.
- A two-pass reverse osmosis (RO) system has been incorporated into the boiler feed water preparation system to substantially increase the run length of the mix bed demineralizers. This configuration decreases demineralizer regenerations and reduces regenerant wastewaterproduction. Additionally, the reject stream from the second pass of the RO will be to blended with the filtered RO feedwater stream and reused.
- Steam condensate that is recovered in the potato plant will be returned to the energy facility for reuse.

The majority of storm water which falls on the site will be discharged through a biofiltration swale and infiltration pond, where it will infiltrate into the ground.

Storm water from the fuel oil storage tank containment will be discharged and disposed of in the biofiltration swale and infiltration pond. Contaminated storm water from the fuel oil storage berm will be diverted to an oil/water separator. The cleaned water will then discharge to either the wastewater sump or the biofiltration swale. If the storm water is too contaminated for discharge to either the biofiltration swale or plant sump, then a licensed firm experienced in handling and disposing of this type of waste will be utilized to collect and dispose of the contaminated storm water. Storm water from the ammonia containment will be discharged to the chemical waste sump and then to the neutralization tank.

Other waste which will be handled on an individual basis include worn equipment parts, sediment periodically collected from sumps and basins, used lubricating oils, and used demineralizer resins. Disposal of these infrequent and low volume wastes will be contracted with licensed firms specializing in handling and disposal of waste materials. Spent catalyst from pollution control equipment will be returned to the manufacturer for regeneration or disposal.

In addition, a comprehensive construction stormwater management plan will be prepared to prevent erosion or sedimentation from potential construction runoff. A Spill Prevention Containment and Countermeasures Plan (SPCC) will also be prepared for the project to address procedures for handling, storage, and containment of hazardous substances.

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 potential for 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. Section 4.11 (Public Health and Safety) of the FEIS further discusses measures to protect surface and groundwater from spill contamination.

See also response to comments; G01-1d, G01-3, G01-9a and G01-9b, and G01-6a through G01-6j.

G01-1d BPA's Resource Programs EIS (DOE/EIS - 0162) looked at resource acquisitions over a 20-year planning period—through 2010. In the Record of Decision, a mix of conservation and generation resources was determined to be the most cost-effective and environmentally responsible. The thermal resources included both cogeneration and gas-fired combustion turbines.

The Resource Programs EIS included an analysis of the environmental trade-offs among a variety of energy resources, including conservation, renewables, cogeneration, combustion turbines, nuclear, coal, and clean coal, as well as a comparison of costs and operating characteristics. Both the potential environmental effects and the costs of gas-fired combustion turbines were considered in reaching a decision to meet load obligations through a mix of conservation, renewables, and thermal generation, including cogeneration and gas-fired combustion turbines.

After thoroughly analyzing the environmental trade-offs among energy resource types and the cumulative environmental effects of adding combinations of these resources to the existing power system, BPA determined that acquiring all cost-effective conservation and efficiency improvements, supplemented by a mix of renewables and thermal resources (including combustion turbines and cogeneration) was the most cost-effective, reliable, and environmentally responsible approach.

The Resource Programs EIS recommended that BPA acquire options on 1,050 MW that could be called on to meet energy needs. The Resource Contingency Program (RCP) was designed to competitively acquire these energy options.

BPA issued a RCP solicitation in May 1992, for energy option proposals. In response to BPA's request for energy options, 64 proposals were submitted. Through an analysis of system cost, project viability, preliminary environmental evaluation and discussion with developers, BPA selected the three projects addressed in this EIS. These combined-cycle combustion turbine energy options are consistent with the resource choices in the preferred alternative of BPA's Resource Program EIS.

In evaluating how best to respond to BPA's RCP solicitation for energy options, the Hermiston Power Partnership conducted a systematic evaluation of alternative generation types and sizes as well as powerplant locations.

HPP evaluated generation types and mixes that were available to them including, hydro, biomass, and a range of thermal generation options including natural gas fuel turbines. HPP concluded that to meet the criteria of the RCP solicitation and to submit a competitive proposal, the project type must be a gas fired generation system.

Following selection of the generation type, HPP investigated alternative generation sites and powerplant sizes ranging from 50MW to 460MW. HPP submitted a proposal to BPA for 3 projects. Each was gas fired, but they varied in size and location. BPA, in its initial review of proposals from prospective developers, short-listed 2 of HPP's projects. During subsequent detailed evaluation of developer proposals, BPA selected the Hermiston Power Project along with the Chehalis and Satsop projects; all gas fired projects.

HPP, in its proposal to BPA, based the project concept and energy output calculations on a General Electric 7FA gas turbine. Following BPA's selection of the HPP project as one of three energy option projects, HPP, as part of studies connected with NEPA compliance and the Oregon Energy Facility Siting Council site certification process, conducted detailed evaluations of a range of equipment and turbine types with various cooling and discharge options. Four gas turbines were evaluated for air permitting (PSD application); the ABB GT24, Westinghouse 501F, General Electric 7FA, and Siemens V84.3, all advanced gas turbines achieving high efficiencies. High efficiency reduces fuel consumption and minimizes emissions.

In the EIS, BPA has evaluated potential impacts from the "worst-case" effluent and emission scenarios that take into account all the alternative turbine designs considered.

The selection of the final generation system and configuration will be made during final design and will be based upon economic considerations as well as regulatory standards for air emissions and other environmental factors.

In addition to the evaluation of generation types and sizes, HPP examined alternative gas pipeline interconnections and routes as well as alternative transmission line routes. The alternatives are presented and evaluated in the EIS.

GO1-2 The power plant utilizes a condenser cooled by water from the cooling tower. Steam from the steam turbine is not discharged to the open air, but is condensed to water and the water is recycled to the steam system.

Air cooling was considered as a means of further reducing plant water use. While air cooling is used extensively in climates that are cool year round, its use in the Hermiston area would significantly reduce plant output during the summer months. This reduced generating capability would occur when outside air temperatures climb and reduce the temperature differential between the air and the exhaust steam in the steam turbine surface condenser. This reduced temperature difference causes the back pressure on the steam turbine to rise, substantially lowering its output and efficiency. The full capability of the plant may be needed during parts of the summer for BPA to meet system peak requirements caused by air conditioning and irrigation loads, therefore a cooling tower was selected as the best means of handling waste heat.

GO1-3 Although not specifically discussed in the EIS, alternative technologies for the control of emissions were considered in preparing the PSD Application, which has been incorporated by reference in the EIS (see Section 3.3.1). In order to obtain an air permit to construct and operate the proposed HPP facility, a PSD Application was prepared and submitted to the Oregon Department of Environmental Quality (DEQ) in April 1994 for review and approval.

The PSD process requires a very rigorous evaluation of feasible emission control technologies as part of the regulatory review process. This evaluation is referred to as the Best Available Control Technology (BACT) evaluation. The BACT evaluation for the HPP project (see EMCON, 1995) discussed the following emission control technologies:

(continued on following page)

Pollutant	Technology Evaluated
Oxides of Nitrogen	• Selective catalytic reduction plus water injection • Selective catalytic reduction plus low-NO_x combustor • Selective catalytic reduction plus water/steam injection or with dry low NO_x combustor • Low NO_x combustor, aggressive water injection, or both • Water/steam injection or low NO_x combustor
Carbon Monoxide	• CO oxidation catalyst • Combustion controls
Particulate Matter	• Low ash fuel • Combustion controls • Electrostatic precipitators • Baghouses
Unburned Hydrocarbons	• Catalytic oxidation • Combustion controls

Dry low-NO_x combustors are available for gas turbines. Most of the major gas turbine manufacturers offer such combustors for their turbines. These combustors significantly decrease NO_x emissions, particularly at high turbine load conditions, but have the side effect of increasing carbon monoxide (CO) and unburned volatile organic compounds (VOC) emissions due to decreased combustion efficiency. Hermiston is using dry low-NO_x combustor technology in conjunction with SCR for NO_x control. This proposed approach results in lower out-of-stack NO_x emissions from the plant than would be achievable with dry low-NO_x combustors alone.

Hermiston considered and adopted the use of aqueous ammonia as an alternative to anhydrous ammonia. Selective Catalytic Reduction (SCR) has been found to an efficient, reliable, and environmentally acceptable method of controlling NO_x emissions from combined-cycle gas turbine power plants at numerous locations in the U.S. and other countries. Earlier in its preliminary design evaluations, Hermiston considered other methods of NO_x control, but found that these technologies did not achieve the same high level of NO_x control as their proposed approach.

GO1-4a to 4e The Hermiston Project may construct two natural gas pipelines to supply gas to the power plant. The natural gas pipelines will be extensions from the Pacific Gas Transmission Company (PGT) and the Northwest Pipeline Corporation (NWP) main interstate pipeline systems. Each pipeline will be approximately 30.5 cm (12 inches) in diameter.

The 6.4 km (4 mile) PGT route passes through mostly agricultural land and some rural residential land. The 13.7 km (8.5 mile) NWP route passes through mostly agricultural, industrial and some rural residential land. Each pipeline would be a permitted or conditional use in the land use designations they would cross.

The proposed pipelines facilities would be designed, constructed, operated and maintained in accordance with Federal DOT's Subchapter D, "Pipeline Safety" as prescribed in Title 49 CFR, Parts 190, 191 and 192. Because these safety standards would be met or exceeded to ensure protection of the public, the DEIS did not present detailed historical pipeline accident data and statistics. However, to address the concerns of the commentor related to pipeline accidents or service incidents, the following discussion and presentation of pipeline incidents is provided.

Pipeline Safety and Accident Reporting Requirements and Statistics

The safety aspects of pipelines are regulated by the Research and Special Programs Administration of the Department of Transportation (DOT) which closely monitors pipeline operators performance. DOT's 49 CFR, Part 191, "Transportation of Natural and Other Gas by Pipeline: Annual Reports, Incident Reports, and Safety-Related Condition Reports," describes the requirements for the reporting of incidents and other annual pipeline summary data by operators of gas pipeline facilities.

Since 1970, 49 CFR has required all transmission, distribution and gathering companies to report to DOT all incidents involving a release of gas from a pipeline. Reportable incidents are defined as any release that:

- caused a death or personal injury requiring hospitalization
- required taking any segment of transmission line out of service
- resulted in gas ignition
- caused estimated damage to the property of the operator, or others, or both of a total of $5,000 or more
- required immediate repair on a transmission line
- occurred while testing with gas or another medium; or
- in the judgement of the operator was significant, even though it did not meet the above criteria.

The DOT changed reporting requirements after June 1984 to reduce the amount of data collected. Since that date operators must only report incidents that involve either a death or injury requiring inpatient hospitalization, or estimated property damage (including the cost of gas lost) of $50,000 or more or incidents that are otherwise considered significant by the operator.

Reportable incidents therefore do not always equate to an explosion or fire. A small leak in an isolated rural area may show up in the DOT reporting system as a service incident if the cost of gas lost plus the cost of the repair meet the $50,000 reporting threshold.

DOT statistics show that the single greatest cause of pipeline accidents is damage from outside forces, construction equipment (e.g., bulldozers and backhoes) soil settlement, washouts or geologic hazards, weather, ships anchors and willful damage.

Third party damage may not result immediately in a failure; the pipeline failure may occur months or years later.

DOT statistics show that human error in equipment operation is responsible for the majority of outside forces service incidents.

The frequency of service incidents is also strongly dependent on pipeline age. While pipelines installed since 1950 exhibit a fairly constant level of service incident frequency, pipelines installed prior to that time have a significantly higher rate, partially due to corrosion. Older pipelines have a higher frequency of corrosion incidents, since corrosion is a time-dependent process. Further, new pipe generally uses more advanced coatings and cathodic protection to reduce corrosion potential.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well-known and less well-marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller diameter pipelines, which have a greater rate of outside forces incidents.

The use of both an external protective coating and a cathodic protection system has been required on all pipelines installed after 1971. This has significantly reduced the rate of failure compared to unprotected or partially protected pipe.

Service incidents or failures on newer pipelines is caused less frequently by internal or external corrosion, faulty construction or material defects.

The primary factors that cause pipeline failures vary from year to year. DOT reported pipeline failure statistics as shown in Table 1 for the period 1970-1992.

Table 1 provides a percentage distribution of the causal factors as well as the annual frequency of each factor per 1,000 miles of pipeline in service. There are presently over 300,000 total miles of natural gas transmission and gathering systems nationwide.

Table 1. Service Incidents by Cause.

Cause	Percentage	Incidents/ 1,000 mi-yr
Outside Forces	53.5	0.70
Corrosion	16.6	0.22
Material defect	16.9	0.21
Construction defect	4.8	0.06
Other	8.2	0.11
Total	100.0	1.30

Table 2 below presents the annual fatalities that occurred on natural gas transmission and gathering lines from 1970 to 1992. Fatalities between 1970 and June 1984 have been separated into employees and non-employees to better identify a fatality experienced by the general public. Fatalities among the public averaged 2.6 per year nationwide over this period. The simplified reporting requirement in effect after June 1984 do not differentiate between employees and nonemployees.

Table 2. Gas Transmission and Gathering System Fatalities. [a/, b/]

Year	Employees	Nonemployees	Totals
1970	1	0	1
1971	2	1	3
1972	3	3	6
1973	1	1	2
1974	1	3	4
1975	5	2	7
1976	1	6	7
1977	3	3	8
1978	1	0	1
1979	4	8	12
1980	0	1	1
1981	5	1	6
1982	4	6	10
1983	1	1	2
1984[c/]	-	-	9
1985[c/]	-	-	6
1986[c/]	-	-	4
1987[c/]	-	-	0
1988[c/]	-	-	3
1989[c/]	-	-	22d/
1990[c/]	-	-	0
1991[c/]	-	-	0
1992[c/]	-	-	4
Annual Average	2.4	2.6	5.2

a/ 1970 through June 1984 - American Gas Association, 1986
b/ U.S. DOT Hazardous Materials Information System
c/ Employee/non-employee breakdown not available for years 1984 through 1992
d/ Eleven fatalities resulted from a fishing vessel striking an offshore pipeline and seven fatalities resulted from an explosion on an offshore production platform.

The average 2.6 public fatalities per year is relatively small considering the more than 300,000 miles of transmission and gathering lines in service nationwide. The fatality rate is approximately two orders of magnitude lower than fatalities from natural hazards such as lightning, tornados, floods, earthquakes.

Statistics released by the National Transportation Safety Board provide another relative measure of the safety of natural gas pipelines. In 1992 almost 42,000

people died in transportation-related accidents (33,790 on highways, 5,410 pedestrians, and 2,717 all others). In the "all other" category fatalities were broken down as follows:

- Railroad - 691
- Marine - 993
- Aviation - 1,013
- Pipeline - 20

The 20 fatalities were associated with all pipelines, including liquid and gas pipelines. (Liquid pipelines accounted for five fatalities and gas pipelines for 15 fatalities.)

Based on approximately 311,000 miles of pipeline in service, the rate of public fatalities for the nationwide mix of gas transmission and gathering lines in service is 0.008 per 1,000 miles per year.

The proposed Hermiston Power Project gas pipelines consisting of 2 new 12 inch laterals totaling 12.5 miles would not result in a measurable increased risk to the nearby public.

apprised of the possible impacts of service incidents. This is appropriate because service incidents can be expected over a 50 year life span for these pipelines.

GO1-4e There have been many explosions and leaks at natural gas facilities and pipelines, sometimes causing loss of life and property. The proposed projects will all include additional gas pipeline construction, which will, to some degree increase the possibility of gas pipeline explosions, fires and accidents. In fact, the pipeline that will supply the Chehalis project blew up in March, 1995. Other recent events of this nature should have been listed and described in the DEIS.

GO1-4f Recent disasters include the 1992 explosion at a salt dome storage facility in Texas, at which three died and 16 were injured. In that catastrophe, a 3 mile square cloud of natural gas was release, and exploded when a person drove their car into the cloud and attempted to restart their vehicle.

GO1-4g The National Transportation Safety Board stated in light of that explosion, that natural gas storage facilities "do not require an adequate level of safety for the public and employees." (Oil & Gas Journal, 10/4/93, p. 40)

GO1-4h But the DEIS did not describe whether the necessary fail-safe procedures will be incorporated into the facility and pipeline which are an affiliated structure with the proposed Hermiston project.

GO1-4i During the October, 1994 floods hear Houston, at least seven pipelines burst, causing releases of hydrocarbons and large fires. The precise cause of the pipelines' failures is not yet clear, but it is suspected that the extreme force of the flowing floodwaters, and the striking of the pipelines by heavy debris, may have contributed to those disasters.

GO1-4j This information is relevant in light of the planned pipelines for these projects discussed in the DEIS, some of which will cross floodplains. The DEIS fails to explain why the Houston (and these other) pipelines burst. Presumably those exploded facilities were constructed to industry standards. In light of these unexplained disasters, the DEIS should include a detailed explanation of its opinion that there is a low threat of danger from these power plant projects' pipelines.

GO1-4k There is no indication in the DEIS that the new pipelines to these new power plant projects, and the existing pipelines which will feed these projects, will comply with the Pipeline Safety Advisory Bulletin ADB-94-05. That Bulletin mandates additional procedures and more stringent construction and design

GO1-4f & 4g The proposed Hermiston Power Project does not include natural gas or liquid natural gas (LNG) storage facilities.

GO1-4h Section 4.11 Public Health and Safety has been revised to describe design and construction and operational safety standards and procedures that will be followed for the power plant and gas pipeline facilities.

GO1-4i, 4j, 4k, 4l, 4m, and 4n As stated in the Pipeline Safety Advisory Bulletin ADB-94-05, the Research and Special Programs Administration (RSPA) of the Department of Transportation and the Texas Railroad Commission (TRC) made no formal determination of the cause of failure of seven natural gas and liquid pipelines in or near the San Jacinto River (Houston, Texas) during heavy flooding in October, 1994.

RSPA and the TRC believe that the "extreme" flooding and force of flowing water was the contributing factor of pipeline damage as well as pipelines being struck by heavy debris.

The preliminary determination of the RSPA and TRC as to the cause of the Houston pipelines failure appears reasonable.

However, flooding conditions and circumstances surrounding the Houston pipeline failure are site and situation specific and there can be no extrapolation of events of the Houston failure to the proposed pipeline interconnections of the Hermiston Project.

For the Hermiston Project, the NWP natural gas pipeline interconnection route would not cross any designated flood plains. Very short portions of the PGT natural gas pipeline interconnection route could encroach on the Umatilla River flood plain depending on the final alignment of the pipeline. The pipeline would be located in areas with little submergence (no more than one to two feet of flooding) during a 100 year flood event.

If portions of the final alignment of the PGT pipeline interconnection encroach into the flood plain, then the DOT Advisory Bulletin ADB-94-05 would apply. PGT and the Hermiston Power Project would review the recommended actions contained in the bulletin for applicability and would implement those actions, deemed prudent or necessary to safeguard those portions of the pipeline within the Umatilla flood plain, from the potential effects of a flood event.

Advisory Bulletin ADB-94-05 identifies the following actions that pipeline operators should consider taking to assure integrity of pipelines in case of flooding. The actions are recommendations and it is up to the operator to determine which actions should be implemented, if any.

- Deploy personnel so that they will be in position to take emergency actions, such as shut down, isolation, or containment.
- Consider extending regulator vents and relief stacks above the level of anticipated flooding, as appropriate.

requirements for pipelines in areas subject to flooding.

GO1-4l The FEIS should describe in detail the Bulletin's requirements for pipeline on floodplains, explain how the Bulletin applies to the project's feeder pipelines, and describe the projects' pipelines' compliance with the Bulletin.

GO1-4m For instance, the Bulletin mandates continuing surveillance of the pipelines, and rapid deployment of personnel in storm events. But the DEIS does not state where, if anywhere, pipeline personnel will be available in this event, and the description in the DEIS of the swift revegetation of the pipeline ROW, may describe conditions under which it will be difficult to maintain pipeline surveillance.

GO1-4n The Bulletin mandates measures to rapidly phase out endangered pipeline reaches. If these measures will be required for these pipeline, the details are not supplied in the DEIS.

GO1-4o Other incidents that merit discussion are an October, 1994 explosion of a pipeline in Torrance, California, injured 30. A December, 1989 pipeline rupture caused by a farmer's plow, triggered the evacuation of 600 people in Butler, Illinois. A construction backhoe caused a gas leak recently in Rainier, Oregon. Seventy five people were evacuated.

GO1-4p In March, 1994, a natural gas pipeline exploded in New Jersey, killing and injuring scores of people and creating a 30 foot deep crater and a fire that destroyed eight buildings and severely damaged six more buildings. A hydrocarbon pipeline broke in Oxnard, California, in December, 1993. Hydrocarbon pipelines broke in Norco and Baton Rouge, Louisiana in 1988 and 1989, killing a total of nine people, injuring 49, and causing almost $400 million in property damage.

FACILITY FIRE DANGER

GO1-5a There is a severe fire danger at the proposed projects. in light of the huge storage capacity and use of fuel oil (and other chemicals including lube oil) at these plant sites. For instance, three workers were killed in a fuel oil fire at the O'Brien Newark Cogeneration facility a few years ago. In the last 10 years, there have been at least 20 fires at power plants that caused significant loss of life, injuries, and/or property damage.

GO1-5b The DEIS fails to describe the full range of safety procedures that should be implemented at facilities that storage large amounts of toxic, hazardous, and flammable materials. Alternative use of less flammable chemicals, such as esters rather than lube oil, should have been discussed in the DEIS.

- Evaluate the accessibility of pipeline facilities, such as valve settings needed to isolate water crossings or other sections of a pipeline that may be in jeopardy.
- Perform frequent patrols, including overflights as appropriate, to evaluate right-of-way conditions at water crossings during flooding and after waters subside. Determine if flooding has exposed or undermined pipelines as a result of new river channels being cut by the flooding or by erosion or scouring.
- Coordinate with, and provide maps and other relevant information to, emergency and spill responders on pipeline location and condition.
- Determine if facilities normally above ground (e.g., valves, regulators, relief sets, etc.) have become submerged and are in danger of being struck by vessels or debris; if possible, and with Coast Guard approval, such facilities may be marked with an appropriate buoy.
- Perform surveys to determine the depth of cover over pipelines and the condition of any exposed pipelines, such as those crossing scour holes. Where appropriate, surveys of underwater pipe should include the use of visual inspection by divers or instrumented detection. Information gathered by these surveys should be shared with landowners. Agricultural agencies may be helpful in informing farmers of the potential hazard from reduced cover over pipelines.
- Assure that line markers are still in place or are replaced in a timely manner, and remind contractors, highway departments, and others involved in post-flood restoration activities of the presence of pipelines and the risks they pose from reduced cover.

GO1-4o and 1-4p See response to comments G01-4a thru G01-4g regarding service incidents and accident statistics. Please note that BPA has no regulatory authority pertaining to pipeline safety standards or accident reporting.

The service incidents/accidents cited are noted in the context of the importance of adherence to pipeline construction and operation safety standards prescribed by the Department of Transportation in 49 CFR Part 190, 191 and 192.

It would not be particularly useful for the EIS to devote a lengthy discussion of the cited accidents because the circumstances and causes are unique to individual incidents and are not pertinent to the proposed Hermiston Project except possibly for reinforcing the importance of meeting or exceeding government requirements and industry standards for designing, constructing and operating a gas pipeline.

GO1-5a, 5b, The fire protection system for the generation facility will be designed in conformance with National Fire Protection Association (NFPA) 850,

GO1-5c | Other recommended procedures should include installation of on-site sprinkler systems, flame-retardant foam or dry chemical release devices on site.

FIRE MITIGATION

GO1-5d | Alternatively, there should be immediate nearby availability for instance at the nearest fire station, of adequate amounts of these fire fighting chemicals and devices, including but not limited to foam wands with backflow prevention devises, a fire flow capacity in excess of 9000 gpm water and 200 gpm of foam, . There should be extensive training of the local fire department, on techniques for fighting turbine/generator fires, paid for by CGF.. These measures are suggest in part in light of a hydrocarbon tank fire in Florida. [1]

DESCRIPTION OF CHEMICAL STORAGE AND RELEASE THREAT NOT ADEQUATELY PRESENTED

GO1-6a | The DEIS failed to describe the degree to which the numerous toxic and flammable chemicals stored at the proposed facilities pose a risk of release, which may cause injuries, deaths, evacuations , and property damage.

GO1-6b | The following information on the frequency and severity of incidents and releases elated to the proposed storage of these chemicals is probably understated, since much of it comes from Department of Transportation data. (DOT)

GO1-6c | The General Accounting Office is skeptical about the DOT reporting system, and complained a year ago that "the department lacks accurate, complete data." Toxic releases in the air and at sea were 10 to 20 times more frequent than the DOT's count, the congressional Office of Technology Assessment estimated in 1986. (LA Times 9/20/92)

GO1-6d | Rail incidents were triple the DOT's figures and those on the highways were twice as high. Even by the DOT count, the frequency of railroad spills increased 36% from 1982 to 1991, while the number of highway spills jumped 34%, according to The Times' computer analysis.

and 5c Recommended Practice for Fire Protection for Electric Generating Plants and Uniform Fire Code. The system's design will be reviewed with the local fire department to ensure conformance with applicable codes and standards. All equipment installed in the plant for fire protection will be compatible with the local fire department's fire fighting equipment. The fire protection system will include a fire water loop and monitors, CO_2 or Halon fire extinguishing systems for the gas turbine, fuel oil tank foam system, sprinkler systems for various areas of the plant, and portable fire extinguishers.

A fire water loop system will be provided for the facility that consists of fire hydrants, building sprinkler systems, the cooling tower sprinkler system, the turbine generator lube oil sprinkler systems and hose stations.

Hose connections at hydrants will be compatible with local fire departments fire fighting equipment. Fire hoses will be sized for two-man operation.

The source of fire water will be from a dedicated portion of the raw water storage tank. A packaged CO_2 or Halon fire suppression system will be provided as part of the combustion turbine fire protective system.

The gas turbine will be protected by an automatically-actuated carbon dioxide or Halon system. It will consist of temperature-sensing devices, spray nozzles, carbon dioxide or Halon storage tank, and all required interconnecting piping and wiring. When actuated, an alarm or indication at the control panel will be activated.

The control room, the battery room, cooling tower, and turbine lube oil systems will be protected by Halon or dry pipe-water sprinkler systems. Upon actuation, an alarm or visual indicator will be activated at the control panel.

Portable fire extinguishers will be provided throughout the plant and within buildings or structures. The type and number of extinguishers will be determined during final engineering. Fire extinguishers will be sized for one-man operation.

According to the Hermiston Fire Department, if the proposed energy 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 (Stearns 1993).

An employee training program will be instituted which will provide all new employees with training in the safe operation of the cogeneration facility. In addition to the operation training, all employees will also receive health and safety training. The initial training will be supplemented by annual refresher training and as appropriate specialized training for specific functions. Training records will be maintained for all personnel.

The plant will be equipped to handle minor personnel injuries by providing a first-aid station and safety shower eye and wash stations in strategic locations in the

plant.

An early warning gas release system will be installed for flammable gases. The flammable gas detectors will monitor work areas to alert personnel if gas concentrations reach 20 percent of the lower explosive limit or at limits to protect human health which ever is lower. If hazardous levels of a gas are detected, the area will be evacuated and appropriate measures taken to shut off the gas supply.

In addition to the mechanical safety and fire protection systems installed as part of the facility there will also be a quick response protocol for employees to follow should potential safety or fire hazards be detected. The response protocol will include notification procedures for emergency response personnel and appropriate local authorities.

GO1-5d Refer to fire protection discussions in FEIS, Sections 3.9.5 and 4.9.5.

The Hermiston Power project is within the Hermiston Rural Fire Protection District and fire protection services would be provided by the Hermiston Fire Department. The department is equipped to handle fire and medical emergencies if they were to occur at the power plant and is in the process of mobilizing a hazardous materials vehicle.

According to J. Stearns, Chief of the Hermiston Fire Department, if the facility is constructed with all fire protection equipment and facilities in accordance with the Oregon Fire Code, there should be no adverse impact to the department's fire fighting capabilities (J. Stearns, Chief, Hermiston Fire Department, December 1, 1993; ENSR Engineering and Consulting 1994)

GO1-6a to 1-6j A discussion of the general and specific procedures for the handling and management of toxic and flammable non-fuel substances has been added to Section 4.11 Public Health and Safety, subsection 4.11.1 Cogeneration Facility, Regulated Non-Fuel Substances. The discussion describes the safety systems for the prevention and containment of spills and the safety standards for design, construction, and operation related to storage and handling of combustible liquid chemicals. Chemical storage areas will provide a secondary containment storage volume equal to 100 percent of the maximum chemical volume in primary containment. A Spill Prevention and Countermeasures Plan (SPCC) will be prepared in accordance with local, state, and federal requirements and submitted to the appropriate agencies for review.

GO1-6e

CHEMICALS TO BE STORED AT THE POWER PLANTS, WHICH CAUSED DEATH OR MORE THAN 50 INJURIES IN INCIDENTS FROM 1982-1991 (LA TIMES, 9/20/92, P. 1)

people evacuated	Chemical	Incidents	Deaths	Injuries
425	Morpholine	34	1	4
12	Fuel oil	2,330	5	10
0	Sulfuric acid	2,779	0	238
57	Sodium hydroxide	1,688	0	84
208	Chlorine	67	0	55

GO1-6f

CHEMICALS TO BE STORED AT THE POWER PLANTS, WHICH ARE AMONG THE TEN CHEMICALS MOST FREQUENTLY REPORTED AS INVOLVED IN TRANSPORTATION INCIDENTS, 1987-91.

Commodity name	Incidents
Sulfuric Acid	1546
Fuel Oil	1313
Sodium Hydroxide	1087

GO1-6g

CHEMICALS TO BE STORED AT THE POWER PLANTS, WHICH ARE AMONG THE 10 CERCLA CHEMICALS MOST FREQUENTLY REPORTED AS RELEASED FROM FIXED FACILITIES DURING 1990

Chemical name	# of notifications
Ammonia	493
Sulfuric Acid	333
Chlorine*	312
Sodium Hydroxide	101

*A chlorine compound (NaOCl) will be stored/used at the power plants.

GO1-6h

Diesel is one of the oil products released most often. There were 655 reported releases, which was the most frequently reported oil product released from fixed facilities in 1990. This may include fuel oil releases. Fuel oil will be stored in multi-million gallon amounts at the power plants.

GO1-6i

CHEMICALS TO BE USED/STORED AT THE POWER PLANTS, WHICH ARE AMONG THE MOST FREQUENTLY REPORTED AS INVOLVED IN OSHA INCIDENTS, 1987-91.

CHEMICAL	ACCIDENTS	FATALITIES	INJURIES
Methane*	70	48	276
Chlorine**	22	2	162
Ammonia	14	4	68
Sulfuric acid	13	8	81
Butane	4	5	3

*Constituents of natural gas
**A chlorine compound (NaOCl) will be stored/used at the power

GO1-6j These figures indicate there is a significant possibility of accident, injury, and degradation of the human and natural environmental from releases of the materials stored at the proposed facility. These issues should have been discussed at length, and similar statistics presented, in the DEIS.

GO1-6k The DEIS does not evaluate the power plant's potential emissions of aliphatic and aromatic hydrocarbons, esters, ethers, alcohols, carbonyl, carbolic acids, and polycyclic organic matter during combustion of fuel oil.

CUMULATIVE EFFECTS OF INCREASED USAGE OF NATURAL GAS

The EIS did not discuss the full panorama of adverse impacts from the increased exploration and processing of gas in Canada, in part sparked by the development of these tree projects.

GO1-7 Discussions of Canadian impacts is mandated by Presidential findings during the Carter Administration regarding the scope of NEPA-covered projects. A description of Cross-border impacts are also appropriate, considering that the Canada Energy Board requires assessments of impacts in the United States, when evaluating proposals for Canadian pipelines.

PROJECT'S AIR IMPACTS: CUMULATIVE IMPACTS

The DEIS fails to examine the cumulative air quality impacts from the Hermiston project. The DEIS does not overlay the pollution plumes from other nearby large polluters, such as other, nearby power plants (US Generating, Coyote Springs, and others) that are planned and/or under construction, with the HO1-1 pollution plume from this project to determine the cumulative localized air quality impacts from the operation of all these facilities.

It is possible that starting up the facility will produce an air impact cumulatively with these other large air pollution sources, that could lead to localized "hot spots" of high concentrations of criteria and/or toxic pollutants.

AIR POLLUTION--CLASS I IMPACTS

The DEIS stated that the sulfur and nitrogen deposition rates, and resulting concentrations are less than recommended loadings at the nearest Class I areas. But the DEIS failed to HO1-2a inform reviewers that the National Park Service and United States Forest Service considers the current concentrations and loadings of these pollutants in Class I areas to be excessive, and both agencies urge no increases in these pollutants that would potentially affect these areas. [2]

HO1-2b The NPS and USFS have far lower thresholds of significance for NOx and SO2 impacts, than are listed in the DEIS. The DEIS

GO1-6k Potential emissions of aliphatic and aromatic hydrocarbons among other organic compound groupings were estimated using the *Identification of Volatile Organic Compound Species Profiles (August 1991)* from the California Air Resource Board (CARB). These profiles in combination with Volatile Organic Compound (VOC) and particulate matter emission rates provided by the turbine manufacturers were used to estimate emissions of aliphatic and aromatic hydrocarbons, along with several other organic compounds (part of the "toxic air pollutants"). The emission rates for toxic air pollutants were based on the combustion of natural gas. This information is provided in Table 4.3-5 of the DEIS, and the PSD Application.

HPP is considering low-sulfur fuel oil as an alternative fuel for combustion when natural gas is not available for short periods of time. The PSD Application is based on the facility combusting only natural gas. When HPP decides to permit the facility to combust fuel oil, all required information and dispersion modeling analysis will be included with a permit modification request to the Oregon DEQ.

GO1-7 No Canadian gas field development, processing or pipeline facilities are proposed in connection with the construction and operation of the Hermiston Power Project.

The environmental impacts of Canadian facilities that were to be built in conjunction with PGT Natural Gas Pipeline Expansion Project were determined to be beyond the scope of the PGT/PG&E Natural Gas Pipelines Projects EIS (FEIS May 1991).

With respect to the reference of "mandated discussions of Canadian Impacts by Presidential findings during the Carter Administration regarding the scope of NEPA - covered projects --"

It is assumed that the comment is referring to Executive Order 12114 of January 4, 1979 Environmental Effects Abroad of Major Federal Actions.

As the exploration, processing, and export of gas within Canada is occurring with full participating and involvement of the sovereign nation of Canada, this EIS does not evaluate the impacts of such actions, consistent with Executive Order 12114.

It should be noted that the Government of Canada (under the Environmental Assessment and Review Process (EARP) and the recently enacted Canadian Environmental Assessment Act of 1995) requires an environmental assessment of energy production and transportation facilities constructed in Canada. This is in addition to other environmental regulations connected with the exploration and development of natural gas enforced in Canada nationally and in the provinces.

HO1-2b (cont.) should have listed in a table the projected impacts from this project in Class I areas, and compared those impacts to the NPS and USFS significance levels, as outlined on Page six of the NPS letter cited in these endnotes.

HO1-1 See response to comment GG5-2. It is possible that the pollutant plumes, and their points of maximum impact, from the HPP and US Generating projects could, under certain atmospheric conditions, coincide. However, as explained in the PSD Application and the EIS prepared for the HPP, the projected "worst case" ground-level pollutant impacts from the HPP facility for permitted operating scenarios will be less that the Oregon DEQ significant impact limits (SILs), below which projected concentrations are considered to be negligible or inconsequential. Impacts below the SILs do not require analysis of cumulative effects from background or future sources.

HO1-2a & 2b HPP's air permitting consultant, EMCON Northwest, utilized the information presented in the referenced NPS letter in formulating the response to this comment. NO_2 and SO_2 impacts in the Eagle Cap and Strawberry Mountain Wilderness Areas were evaluated through dispersion modeling results previously performed in connection with the HPP PSD application. The following table presents the maximum predicted (modeled) concentrations of NO_2 and SO_2 expected in the Wilderness areas as compared with the NPS suggested thresholds of significance.

		Predicted Concentrations	
Pollutant	NPS Suggested Significance Threshold	Eagle Cap Wilderness	Strawberry Mtn. Wilderness
Nitrogen Dioxide (NO_2):			
Annual Average	0.025 µg/m³	0.011 µg/m³	0.020 µg/m³
Sulfur Dioxide (SO_2):			
Annual Average	0.025 µg/m³	0.0003 µg/m³	0.0006 µg/m³
24-Hour Average	0.07 µg/m³	0.0046 µg/m³	0.0053 µg/m³
3-Hour Average	0.48 µg/m³	0.0103 µg/m³	0.0119 µg/m³

The projected levels are well below the NPS suggested significance levels.

An evaluation of SO_2 impacts was not required for the PSD application. The ODEQ administered PSD program specifies "significant emission rates" for each pollutant. If the specific emission rate is below the threshold value, then no air quality analysis is required. This level is 40 tons per year for SO_2. The HPP permitted level of annual SO_2 emissions is 8.5 tons per year, well below the threshold level, thus PSD review was not required for SO_2.

With respect to the USFS reference made by the Commenter, see response to comment GG5-3.

For instance, the National Park Service's significance threshold for a 24 hr. SO2 average, is .07, and is .48 for the SO2 3 hr average. [3]

GO1-8a

PROJECT RELATED TRAFFIC

Construction related traffic, and truck traffic from the plant's suppliers, and the commuter trips from the plant's employees, will contribute many tons per pollution annually.

GO1-8b

The DEIS omits calculations of construction equipment and commuter traffic exhaust emissions, and the prospective cumulative effects of these pollution sources in combination with the power plant emissions.

HO1-3

SULFURIC ACID MIST

The Tenaska II plant near Tacoma is similarly configured to the Hermiston plant. At Tenaska II, sulfur mist emissions from a single 7221 turbine are estimated at 8 to 9 pounds per hour. But the BPA EIS does not mention any sulfuric acid mist emissions from the Hermiston project. Calculations of beryllium emissions from the Hermiston plant during oil firing, are also neglected.

HO1-4a

PM-10

This plant will emit many tons per year (TPY) of PM-10 from the exhaust stacks. PM-10 is fine particulate that is capable of being drawn deep into the lungs. PM-10 is highly damaging to human health. In addition to the power plant exhaust, there are other sources of PM-10 and total suspended particulate (TSP) from this project; construction will create about 1 ton of TSP per acre of disturbance per month. In 1.5 years of construction, given 7 acres of disturbance on the average, another 100 tons of TSP will be emitted.

HO1-4b

Construction equipment, truck and car traffic related to this project, both in the construction and operation stage, will be an additional PM-10 and TSP source.

HO1-4c

In addition, the cooling towers are PM-10 and TSP sources, to the degree which the cooling water contain solids, which are emitted from the cooling tower exhaust as particulate. A large power plant using water high in solids content can emit many tons per year of PM-10 and TSP.

HO1-4d

The subject of the health effects of PM-10 should have been presented in depth, because many recently published studies demonstrate that PM-10 and TSP are far more harmful that previously considered. In one study of the Seattle area, days of high particulate concentrations in the air were correlated with increased hospital visits for asthma.

GO1-8a and 8b Information has been added to Section 4.3 to discuss construction related emissions and mitigation.

HO1-3 The HPP project is proposing to use natural gas as the primary fuel for combustion in the gas turbines. The current PSD Application lists only natural gas as the fuel for combustion. Meteorological and particulate data are now being collected at the site. Once a full year's data has been collected so the environmental impacts of firing distillate can be accurately modeled, HPP intends to seek a permit modification from the Oregon DEQ that would allow short-term operation on distillate during periods that natural gas is not available. HPP will conduct dispersion modeling analysis in accordance with Oregon DEQ requirements as part of the process to amend its air permit for limited operation on fuel oil. Only low-sulfur fuel oil would be used should low-sulfur fuel oil be considered as a backup fuel.

The sulfuric acid mist emissions from combusting natural gas are negligible. In Tables 4-9 through 4-12 of the PSD Application, the sulfuric acid emissions rate for each turbine design is provided. The total estimated emission rate for sulfuric acid is 110 lbs/yr. (assuming 8,760 hours of operation/year).

The maximum potential emission rate for beryllium compounds was estimated to be less than 0.8 lbs/yr. from the combustion of natural gas. The emission rate estimate is based on maximum fuel combustion rates in combination with the particulate matter specification tables from the *Identification of Volatile Organic Compound Species Profiles (August 1991)* from the California Air Resource Board (CARB). The potential emission rates for toxic air pollutants are provided in Table 4.3-5 of the EIS.

HO1-4a & 4b The proposed HPP facility followed the air quality permitting requirements of the Oregon DEQ in preparing the PSD Application. The ambient impacts from the proposed facility will not be significant under Oregon DEQ regulations.

HPP will minimize fugitive dust emissions during construction, and maintain a program to minimize fugitive dust emissions during facility operation. Measures to minimize fugitive dust during construction will include the application of water or dust suppressing agents to the disturbed ground. To minimize dust during facility operation high use areas will be paved. These areas will be swept periodically to prevent dust accumulation that would be susceptible to blowing.

HO1-4c With respect to TSP, a small portion of cooling water escapes from the cooling tower in droplet form. Like the cooling water, the droplets contain salt. Salt deposition patterns for the area surrounding the cooling tower were predicted by the SACT I (Seasonal and Annual Cooling Tower Impacts) model developed by the Argonne National Laboratory in the early 1980s on behalf of EPRI.

The Oregon Department of Environmental Quality (ODEQ) standards for particulate fallout, including salt deposition are:

Industrial Zoning	10.0g/m^2 per month
Residential Zoning	5.0g/m^2 per month

H01-4e

In another series of similar studies, days of high particulate concentrations were correlated with days of high death rates in Santa Clara, California, Steubenville, Ohio, Birmingham, Alabama, and Philadelphia, Pennsylvania, among seven separate studies on this topic. Particulate have been recently, convincingly implicated in harm to pulmonary function.

H01-4f

Some important conclusions from these studies is that harmful health effects occur even when particulate concentrations ar far, far below the legal limits, there is no apparent particulate threshold for adverse health effects, and that harmful health effects are apparently caused by very minor increase in particulate concentrations.

H01-4g

It appears from these studies that <u>any</u> increase in PM-10 and TSP levels will cause an adverse health impact. This is a significant impact that should have been discussed in the DEIS.

H01-4h

The DEIS also failed to model 1-hr maximum concentrations of PM-10, supplying 24-hr averages instead. We suggest 1-hr concentrations be modeled because of the serious implication of increasing already elevated PM-10 levels, as shown by these recent studies.[4]

G01-9a

<u>WATER POLLUTION</u>

The DEIS' list of water treatment chemicals does not list any details of the toxicity of inhibitors or algicides that would be discharged.

G01-9b

Lacking a complete discussion of the possibly pollutants in this source's discharge, it is not possible to conclude that the these sources waste water will not contribute to water treatment problems.

G01-10

<u>GLOBAL WARMING</u>

The DEIS fails to discuss possible mitigations for carbon dioxide emissions, and fails to evaluate the contribution made by the plants' massive steam discharges to global warming. Heated water vapor is widely recognized as a contributor to the global warming problem (California Energy Commission, 1991). T h i s source will not mitigate their CO2 emissions.

H01-5a

<u>DETAILS LACKING ON DEVELOPER'S ENVIRONMENTAL VIOLATIONS</u>

TransCanada is a partner in the Hermiston power plant. According to published accounts, the Federal Bureau of Investigation raided the offices of a joint venture in which TransCanada was a partner, regarding potential violations of federal wetlands law. Those violations occurred on a pipeline from Canada into New York state.

Assuming a dissolved solids concentration of 0.0052g per gram of solution, the highest salt deposition rate which occurs at a distance of 200m (656 feet) East of the cooling tower, within 1km (0.6 mile) of the cooling tower is 0.287g/m² per month, a fraction of the ODEQ standards. This level of deposition is not expected to have an adverse environmental impact.

Section 4.3 of the EIS presents the results of air quality modeling to determine the amount of combustion by-products that would be emitted to the ambient air. All particulate matter was assumed to have an aerodynamic diameter of less than 10 microns. Modeling results indicated that the maximum 24-hour project related PM_{10} concentration was greater than the Oregon SIL for natural gas and fuel oil firing and greater than the Federal SIL for fuel oil firing. PM_{10} concentrations greater than the Oregon SIL were predicted to occur during periods when the ambient temperature is greaterthan 32° (90°F) and when the project is burning natural gas and is operating at less than 100 percent load. The Air Contaminant Discharge Permit, as issued by the Oregon DEQ, will permit only operating scenarios that maintain plant 24-hour PM_{10} concentrations below Oregon's SILs.

H01-4d, 4e, 4f, & 4g See response to H01-4a &4b.

H01-4h The air quality standards for permitting a facility subject to PSD in the state of Oregon requires modeled impacts to be compared to Oregon DEQ significant Impact Levels (SILs), and the National and Oregon Ambient Air Quality Standards. The averaging periods established for these standards for particulate matter are annual and 24-hour periods. The PSD Application provides dispersion modeling impact results for particulate matter covering these regulatory averaging periods.

GO1-9a and 1-9b A discussion of the chemicals to be used in the boiler and steam turbine system to provide protection from corrosion and oxidation has been added to Section 4.2.2 Water Quality Impacts.

Cogeneration wastewater will 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. ODEQ approved the amendment of J.R. Simplot's Water Pollution Control Facilities Permit to allow incorporation and application of HPP's cogeneration wastewater. The addition of HPP cogeneration wastewater will not require additional treatment and no adverse impacts to surface or ground water quality are anticipated.

GO1-10 CO_2 is one of the greenhouse gases that may contribute to global warming. However, combustion of carbon based fuels is but one source of CO_2. CO_2 is also emitted from other sources such as respiration, organic decomposition, refrigerants, and aerosols.

CO_2 emissions are not currently regulated to any ambient concentration or emission standard. The Hermiston Project does not contain technologies specifically

designed to control CO_2 emissions. However, one of the goals of the Hermiston Power Project is to optimize energy efficiency in project design to minimize greenhouse gas emissions. The combined-cycle design of the power plant is the most efficient available today and produces less CO_2 per kilowatt of power generated than conventional power plants using fossil fuels.

Nonetheless, any fossil fuel use emits more CO_2 than non-fossil fuel alternatives such as hydroelectric power, wind energy or conservation. These alternatives, however, have other economic and environmental consequences that are generally weighed against the effects of burning fossil fuels to develop the best overall strategy for reducing demand for energy and satisfying remaining demand.

According to the Climate Change Action Plan (October 1993), EPA is encouraged to promote the use of natural gas. Burning natural gas is considered a pollution control strategy under the Clean Air Act because it would lower the cost of combatting the severe ozone pollution problem plaguing many U.S. cities in a way that also reduces greenhouse gas emissions. The plan directs DOE to work with the Federal Energy Regulatory Commission (FERC) to continue to implement reforms that will increase the availability and useof natural gas. The plan recognizes the environmental, economic, and national security benefits of encouraging the use of natural gas.

In order to meet its load obligations, BPA is considering multiple solutions such as: acquiring new generating resources (both renewable and thermal), conservation, and efficiency improvements. The impacts of each resource type were studied and evaluated in BPA's Resource Programs Environmental Impact Statement (RPEIS). The RPEIS analyzes the environmental trade-offs of new energy resources within the context of meeting the electrical needs of BPA customers. The impacts are considered in detail, and are evaluated together to determine the cumulative effects of adding various combinations of resources to the existing system. Combustion of natural gas is one of several resource types considered. BPA has found it to be a necessary and logical element of its resource planning over the next few decades. Although the combustion of natural gas will produce carbon dioxide emissions, this has already been considered within the RPEIS as part of the total environmental cost from all resources.

Natural gas emits less carbon dioxide per unit of energy provided than any other fossil fuel, and the HPP power plant is highly efficient compared to conventional power plant combustion systems. To the extent that it displaces operation of existing less efficient fossil-fueled power plants, it will help to reduce emissions of carbon dioxide. BPA recognizes that all generating resources, including combustion of natural gas, produce adverse environmental impacts. However, natural gas is inherently one of the cleanest.

Thus, the HPP proposed project would be consistent with the current National Climate Change Action Plan on several counts in its endeavors to minimize greenhouse gas emissions such as carbon dioxide.

The comment stated the DEIS fails to evaluate the impact of massive steam discharges to global warming. The plant will be designed to use all steam in the steam turbine and the potato plant. Exhaust steam from the steam turbine will be condensed to water and the water will then be recycled.

BPA feels that by displacing facilities such as coal, with cleaner, cheaper natural gas fired facilities we are mitigating for CO_2. Each of the project sponsors have agreed to establish mitigation funds to offset local environmental effects. While these funds are not specific to mitigation of CO_2 emissions, BPA intends to hold sponsors accountable by directing these funds to any regulatory requirements for mitigation of emissions.

H01-5a & 5b The Federal Bureau of Investigation ("FBI") proceeding alluded to relates to a pipeline ("Iroquois System") owned by the Iroquois Gas Transmission System, L.P., in which TransCanada holds a 29% general partnership interest, and which is operated by a TransCanada Subsidiary. The comment refers to "violations [which have] occurred" and also includes the phrase "in addition to the federal violations," but the facts are simply that an investigation was initiated in 1992 by the U.S. Attorney's Office for the Northern District of New York in conjunction with the United States Environmental Protection Agency and the FBI. An FBI press release in 1992 suggested that areas under investigation include possible environmental violations, wire fraud, mail fraud and providing false information or concealment of information from federal agencies in conjunction with the construction of the pipeline. No criminal charges have yet been filed in connection with this matter, and Iroquois management believes that pipeline construction and right-of-way activities were conducted in a responsible manner. The implication of the comment — that Iroquois has been found guilty of wrong doing — is incorrect.

With respect to the remarks with regard to being "cited" in Canada, the facts are that TransCanada, its construction contractor, environmental inspectors and an analyst are currently subject to charges under two provincial statutes, but the total number of charges against these five defendants now is 82. Originally, in 1993, there were ten defendants with an aggregate of over two hundred charges, including charges under a federal statute, which is no longer the subject of these proceedings. TransCanada continues to defend these charges, which relate to discharge of sediment into water during construction of new pipeline in the province of Ontario. TransCanada believes that all necessary environmental precautions were taken in conjunction with this construction.

In addition to the federal violations of TransCanada's joint venture in this country, Canada cited TransCanada for over 200 violations of that country's water quality and wetlands laws, according to published accounts. The EIS should have discussed what investigation, if any, was undertaken by BPA into the violation history and background of the developers of the Hermiston project. The FEIS should carefully examine the prior record of this company to notify permitting agencies of the potential issues that have arisen where TransCanada has operated, and which may need to be addressed in permits for this project.

NEED FOR ACTION

GO1-11a There is reason to doubt that BPA should be encouraging any new sources on-line at this time. Low growth economic estimates provide a drastically lower projection regarding the need for power. As an example, the recent closure of part of the Reynolds Aluminum facility in Longview, Washington instantly reduced the regional energy need by many megawatts.

In addition, several independent power producer, utilities, utility districts, and industrial customers of BPA are developing their own power supplies, since BPA's price increase for its energy was announced. These new power supply developers may include but are not limited to the Intalco Aluminum facility, PGE, and the Clark County and Snohomish PUDS. Several

GO1-11b independently owned power plants have been built in the Northwest recently (Tenaska I & II, Scott Paper, Texaco, Georgia-Pacific in Washington, James River has built a plant in Oregon, and Willamette Industries has a plant under construction, Weyco/Longview has a 400+ plant fully permitted, score of small hydroelectric projects are currently undergoing NEPA review, about 8000 MW of projects have applications pending before the Energy Councils in Washington and Oregon alone). It is likely that the Northwest will reach power/supply energy equilibrium without the purchase of power by BPA from this source's projects.

GO1-11c Meanwhile, BPA is threatening to cut the power output from Tenaska II in half, and is delaying construction of at least 2 geothermal plants, and has stopped construction on a hydro plant. About 300 MW of wind power is also seeking permits to build and plug into the BPA grid. In light of these events, it is not prudent to proceed with permitting yet another 1000 MW, including the 400+ MW Hermiston project.

ALTERNATIVE OF REDUCING ENERGY DEMAND

GO1-12a In sum, BPA is buying the power from this project as part of a worst case prediction. While it may be prudent to plan for the worst case outcomes, it can also result in needless degrading of the environment, when the selected alternative has adverse impacts that exceed the possible impacts from other alternatives

GO1-11a, 11b and 11c The Bonneville Power Administration has optioned these energy resources and this EIS addresses the environmental consequences of acquiring all of the generating optioned resources. No decision has been made to acquire any of the projects. The decision to acquire any or all of these option energy projects is influenced by the variables in Section 1.1 Purpose and Need. Federal System load growth is strongly influenced by economic growth, competition from other energy suppliers, and the shutdown of energy-intensive industrial facilities to name a few. Under a scenario of lower economic growth, more energy-intensive industries being shut down, and BPA losing customers to competitors, BPA will have lower Federal system load growth. Lower load growth makes it more unlikely that the optioned resources would be acquired. Energy options are a cost-effective method of reducing resource development and lead time and allows for the decision to acquire and have the resource on-line closer to the actual need for the resource.

GO1-12a No decision has been made to acquire the output of these optioned resources. These optioned resources are consistent with the "emphasize conservation" alternative of the Record of Decision for the Resource Programs EIS.

designed for more realistic outcomes.

GO1-12b | Although BPA calls its selected course of action the conservation alternative," for the last year BPA has focused the vast majority of its energy activity on the development of new power plants, rather than conservation.

GO1-12c | Several groups strongly opposed new energy projects during hearings before Congress member DeFazio's recent hearings in Portland, and these and other groups also opposed projects at the Northwest Power Planning Council's hearings.

GO1-12d | These groups objected to a wide range of this proposal's impacts, including the failure to emphasize energy conservation, the failure to construct a cogeneration facility, and air and water quality impacts. This large opposition renders this project controversial.

POWER LINE ALTERNATIVE

GO1-13 | The alternative of completely burying all power lines associated with this project should be discussed in detail and selected. Power line burial has been used at many projects, and would reduce the visual impact of these projects, and many reduce EMF exposure.

AGENCY COOPERATION URGED

GO1-14 | BPA should encourage and recruit the relevant state agencies, including the Oregon DEQ and Energy Council, to participate as cooperating agencies to insure that these EISes comply with the state rules. NEPA urges federal agencies to seek a cooperative posture with state agencies, in its section titled Elimination of duplication with State and local authorities (40 CFR 1506.2 (b):

" (Federal) Agencies will cooperate with State and local agencies to the fullest extent possible to avoid duplication between NEPA and State and local requirements."

GO1-12b BPA has terminated acquisition of all of the generation projects selected under the Competitive Acquisition program due to frustration of purpose. On the other hand, BPA has met its conservation acquisition goals the past several years, including acquiring 49 average megawatts of conservation in FY 1993 and 59 aMW in FY 1994.

GO1-12c Comment noted.

GO1-12d Comment noted.

GO1-13 The RCP projects have been designed to minimize transmission line impacts. For the RCP Projects, they are located either adjacent to or very near transmission systems and will require only modest amounts of new transmission corridors, or are maximizing the use of existing transmission right-of-ways, corridors, and transmission poles. Burying all of the RCP transmission lines is not cost-effective or practical since these transmission poles and corridors already exist. See also response to comment HI1-1 regarding underground technology and cost.

GO1-14 BPA has been working cooperatively with both the states of Oregon and Washington. BPA has worked with the Washington Energy Facility Site Evaluation Council to ensure that this EIS meets the standards of the State Environmental Policy Act and can be adoptable by the state. BPA has worked with both states in coordinating project information and have held joint public meetings.

ENDNOTES

1. Reported in Fire Engineering, 11/93, p 38-50, and an article in Power, 7/94, pp. 49-52.

2. NPS letter by Winters to DOE, Butler, 2/19/92, p. 6

3. SO2 significance levels for the NPS taken from 5/20/91 letter from NPS to EPA's Bill Lamason.

4. Particulate Air Pollution and Hospital Emergency Room Visits for Asthma in Seattle. American Review of Respiratory Disease. Schwartz, Slater, Larson, Pierson, and Koenig. V. 147, pp 826-831, 1993.

Air Pollution and Daily Mortality in Birmingham, Alabama. American Journal of Epidemiology. Joel Schwartz. Vol. 137, No. 10, 1993. See particularly figure 6, page 1145 for an illustration of how any increase in PM10 correlates to increased deaths.

Air Pollution and Daily Mortality in Steubenville, Ohio. American Journal of Epidemiology, Joel Schwartz and Douglas Dockery. Vol. 135, No. 1. 1992.

Increased Mortality in Philadelphia Associated with Daily Air Pollution Concentrations. American Review of Respiratory Disease. Schwartz & Dockery. 145:600-604. 1992.

Pulmonary Function and Ambient Particulate Matter. Archives of Environmental Health. Chestnut, Schwartz, Savitz, and Burchfiel. May/June 1991 (Vol. 46 (No.3) p 135-144.

Particulate Air Pollution and Daily Mortality: A Synthesis. Schwartz. Public Health Review 1991/92; 19:39-60/

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WSEO
Washington State Energy Office

Comments on Bonneville Power Administration Resource Contingency Program Draft Environmental Impact Statement

The Washington State Energy Office (WSEO) thanks you for the opportunity to comment on the Resource Contingency Program Draft Environmental Impact Statement (DEIS). This document highlights environmental impacts of proposed options on combined cycle combustion turbine facilities at Chehalis, Hermiston, and Satsop, five units totaling 1090 aMW.

This comment will be brief, due mostly to the fact that WSEO's comments are limited to energy-related issues. The meat of this document lies in the environmental field, in which this office defers to the expertise of other state agencies.

GG3-1 The major flaw with the document is that it seems at odds with current Bonneville Power Administration (BPA) pronouncements in other forums. The resource options concept is a product of the BPA of several years ago, a BPA interested in taking on the regional responsibility of building new generation and concerned about the timeliness of such generation coming on line. The stated purpose of the study is to determine what, if any, of the proposed units at the projects BPA will hold for future acquisition, with the actual acquisition to take place in the future only if there is a need for power and if the units are cost-effective. Furthermore, on page 2-2, the document states "the proposed action may satisfy only part of BPA's power needs" and other resources such as cost-effective conservation will be considered independent of action on these projects. Currently, BPA is taking positions that seem to question all the basic assumptions underlying the resource options concept.

GG3-2 The major question is whether the project(s) envisioned in the Resource Contingency Program really figure in BPA's current plans. For instance, the Business Plan Supplemental DEIS , in Section 4.2.3.2 concerning BPA generation acquisition, makes general mention of only 800 aMW of options being pursued through the Resource Contingency Program. How does this smaller number compare to the 1090 aMW in this DEIS? In the Status Quo Alternative of the Business Plan Supplemental DEIS, there is mention of only 250 aMW of additional resources being optioned. Again, what is the relationship with the 1090 aMW figure in this DEIS? Is the Resource Contingency Program an integral part of the Status Quo? Also, at page 4-78 of the Business Plan Supplemental DEIS it says that BPA, under its preferred Market-Driven Alternative, would not acquire the additional generation proposed by the 1992 Resource Program. In the Market-Driven Alternative, however, there is mention of "fuel options (gas ventures)" being used to provide for contingencies not covered by short-term energy purchases. How, if at all, does the concept of "fuel options" relate to the 1090 aMW of options noted in this DEIS?

GG3-3 WSEO has two concerns about this Resource Contingency Program DEIS. First, the emerging Business Plan seems inconsistent with the Resource Contingency Program. The options concept, wherein BPA stockpiles resources for future need, appears absent from all alternatives outlined in the Business Plan Supplemental DEIS. Second, if it is true that the Resource Contingency Program has been superseded by events and no longer figures in BPA plans, should the DEIS process for the Resource Contingency Program be continued at all? Two of the sites mentioned in the Resource Contingency Program DEIS have already been submitted to the Washington Energy Facility Site Evaluation Council (EFSEC) process. WSEO is concerned about the waste of resources involved in continuing the siting process for plants that no longer fit with current BPA plans.

GG3-1, 3-2, 3-3, and 3-4 BPA's proposed action (Market Driven BPA) in the Business Plan EIS (DOE/EIS 0183), BPA would in part: (1) acquire resources only to complement existing resources and satisfy market demand; (2) rely to some extent on planned market purchases rather than long-term acquisition of generating resource output to meet any increases in BPA loads; and (3) review planned and existing generation projects and terminate those that are more costly than power purchases or new resources. However, BPA will continue to option the 1090 aMW of RCP resources as a contingency as outlined in the RCP EIS. The only alternative in the Business Plan EIS that would not support the RCP options is the *Minimal BPA Marketing* which is the only alternative that would have BPA not acquire any generating resource under any conditions. See section 4.2.3.2 of the Business Plan EIS (pg 4-24 - 4-26) for more details of BPA's resource acquisitions under the various alternatives.

Fuel options (gas ventures) would provide for contingencies not covered by short term purchases while the RCP options provide contingency for longer term scenarios.

1991 was the last year that BPA and the NWPPC released a joint forecast. A draft 1995 load forecast us likely to be released in November 1995. BPA's 1994 Pacific Loads and Resources Study forecasts of regional 'medium load growth' load to grow from 21,902 aMW to 23,953 aMW between the years 1996 and 2005 or an average annual growth rate of .94 percent.

GG3-4 As noted on page 1-1, the document is based on BPA and Northwest Power Planning Council joint forecasts of need made in 1991. Much has changed in the energy world since that time, especially the increasing availability of relatively inexpensive gas-fired combustion turbine resources. Those resources are cited by BPA in its Draft Strategic Business Plan as the reason it is worried about losing load and being able to afford to carry on conservation programs. The BPA talking in this Resource Contingency Program document does not sound like the same BPA which is promoting a Strategic Business Plan based on short-term power purchases in the open market. In the competitive energy field envisioned in the Strategic Business Plan it may not make sense to pursue resource options as a way to ensure the availability of resources to meet future needs. It should be noted that WSEO's comments on the Business Plan supported the longer term focus of planning activity resulting in the resource contingency concept rather than the short term focus on opportunity purchases characterizing BPA's preferred strategy in the Business Plan Supplemental DEIS.

GG3-5 For all three sites, the Draft Environmental Impact Statement has noted seismic hazards, two of them high, yet there is little mention of on-site diesel fuel storage, except the boiler plate language that such substances "can have adverse effects on the environment if released in an uncontrolled manner" and accidental release could increase "exposure of the fuel to the facility personnel." There is mention, at Section 3.1, of potential environmental effects from rupture or leakage of gas from the facility or from the pipeline for each site, but no mention of possible water quality concerns from rupture of the million gallon oil storage tanks.

On page 1-10, of the Satsop document, Section 1.2.4, at the end of the second paragraph, 24,857 gpm should be 246, 857. This was discovered in verifying some calculated figures.

HG1-1 On page 3-8 of the Hermiston document, Section 3.2.5, why is the replacement cost of the foregone generation associated with water withdrawals from the Columbia valued at an avoided cost of power of 6.7 cents per kilowatt hour? The cost itself is trivial, but it is surprising to see a number of this magnitude, especially since BPA itself has been claiming there was ample power available in emerging competitive markets in the 3.5 cent range.

GG3-5 As required by Oregon EFSC, the developer must provide prior to construction a Spill Prevention Control and Countermeasure (SPCC) plan for the construction and operation of the HPP. This plan will contain measures and procedures sufficient to control any oil spill on the plant site. See also repsonse to comments GO1-6a through 6k, and Section 4.11.1 of the FEIS.

HG1-1 Comment noted. Text changed in Section 4.2.5. BPA will use revenue loss figure instead of avoided cost.

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LOG #: RCP-3-50
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Environmental Project Manager
Attn: Dawn R. Boorse
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P.O. Box 3621
Portland, Oregon 97208-3621

Dear Ms. Boorse:

With regard to the Resource Contingency Program Draft EIS, following are comments to the portions of the document relating to air quality. We appreciate the opportunity to participate with you in this environmental review process.

Our primary concern is with preserving the pristine nature of the Region's wilderness resource. We are also concerned with impacts to the Columbia River Gorge National Scenic Area (CRGNSA). In summer, northwesterly winds sweep all emissions in western Washington down and across the Cascades toward the CRGNSA.

GG5-1

Factors related to population growth in the Pacific Northwest are resulting in significant increased air pollution in the airsheds affecting wilderness. Unacceptable impacts are occurring in these areas, particularly downwind of the major urban areas and in those areas which have large industrial pollution sources, such as the Centralia and Boardman coal fired power plants. While natural gas is certainly a preferred choice over coal or oil generation, it is a concern more effort is not being placed on renewable energy sources, such as wind and solar. The cost of air pollution impacts to the environment are substantial (see enclosure). When these costs are factored into the decision process one would hope renewable options would be more economically viable. This EIS does not adequately address these alternatives in Section 2.

GG5-2

Another major issue is treatment of cumulative effects. Ecosystems and the regional visibility conditions are affected by the total pollutant loading. The analysis of incremental additions, from new sources, is not relevant if the background pollutant loading is not factored in. Considering the Puget Sound urban sources, and the Centralia and Boardman facilities, all three projects are proposed in locations with substantial air pollution related problems that have not been addressed in the cumulative effects portions of this EIS. It is significant to note the Centralia power plant will soon be the single largest point source of air pollution in the western United States.

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GG5-1 Comment noted. See response to comment GI1-1.

GG5-2 As detailed in the Prevention of Significant Deterioration (PSD) Application document (EMCON, 1995), there will incremental effects on air pollution concentrations and on regional visibility; however, those effects have been modeled and are negligible. As explained in the PSD Application document, the projected increases are below the trigger levels that require a cumulative analysis for air quality impacts or visibility impacts. With regard to HPP's contribution to potential cumulative impacts to regional air quality from the possible operation of the three RCP projects, the HPP is on the east side of the Cascades, while the Satsop and Chehalis facilities are on the west side. These are completely different air sheds, and the Cascade range effectively prevents any mixing from occurring. See also response to comment HO1-2a and 2b.

GG5-3 We would, finally, like to refer you to the Air Quality Related Value portion of the Chehalis draft PSD application (enclosed). This is a reasonable example of an analysis, we would like to see, of air pollution impacts to wilderness, although note that it too has not dealt with cumulative effects.

Sincerely,

ROBERT J. DEVLIN
Director of Natural Resources

Enclosures

GG5-3 As discussed in the EIS, the PSD Application prepared for the HPP project evaluated the effects of the proposed facility on the Air Quality Related Values (AQRVs) such as soils, vegetation, and visibility [see Section 7.3 and 7.4 of the PSD Application, (EMCON, 1995)]. In preparing the AQRV analysis for the PSD Application, the guidance prepared by the USFS contained in the *Guidelines for Evaluating Air Pollution Impacts on Class I Wilderness Areas in the Pacific Northwest* (USFS, May 1992) was followed. No information is presented in this document that addresses a specific protocol for evaluating cumulative effects.

As stated in the PSD Application for the HPP project, the emission rates of VOCs and SO_2 are well below the emission rates requiring ambient impact analysis, and are believed to be insignificant. The impact of NO_2 emissions in the Class I areas was determined to be well below the threshold value of 15 ppb (the minimum value stated in the USFS guidance document where any injury to plant species is expected to occur). The threshold values provided by the USFS and the "worst-case" modeled impact in a Class I area from the proposed HPP facility are provided in Table 7-4 (from the PSD) presented below.

A visibility analysis was performed for the Eagle Cap Wilderness Area, the Strawberry Mountain Wilderness Area, and the Columbia River Gorge National Scenic Area, using the USEPA-approved VISCREEN model. The results of the visibility modeling analysis demonstrated that visibility criteria would not be exceeded by the emissions from the proposed HPP facility.

Table 7-4. Nitrogen Dioxide Effects for Plant Species, Hermiston Power Project.

Impact	NO_2 24-hour[a/] Concentration (ppb)	Model 24-hour[b/] NO_2 Concentration (ppb)
None	<15	3.71
Potential	15-50	—
Severe	>50	—

a/ Source: U.S. Forest Service, May 1992.

b/ Dispersion model predicted worst case impact = 4.93 $\mu g/m^3$ = 3.71 ppb at standard temperature (0°C) and pressure (1 atm).

References: USFS, May 1992, *Guidelines for Evaluating Air Pollution Impacts on Class I Wilderness Areas in the Northwest, Portland, Oregon, PNW-GTK-299.*

Attachment to Comment GG5-1

ECONOMIC EXISTENCE VALUE OF WILDERNESS

Note: The following discussion and table was originally prepared to demonstrate the economic value of wilderness and parks in the context of impacts from the Centralia Coal fired power plant.

In recent years, passive use value (a part of existence value) has been applied for the purpose of natural resource damage assessments. As a result, it has been written into some federal law. These concepts, used to determine value of some natural resources, are applied because the American public values wilderness and parks--even if they will never visit or see it--they derive comfort and value simply from knowing it exists and is being cared for. These concepts can be used to estimate the economic value of preserving the pristine nature of wilderness and parks. This concept applies particularly to irreversible damage, such as the potential loss of a lichen species.

The following table of values is based on the assumption that each United States household is willing to pay one dollar ($1) per year to preserve the wilderness values in an area such as Goat Rocks or Alpine Lakes. The horizontal axis is the expected lifetime of the power plant, while the vertical axis is a projection of the annual growth of these benefits (preservation of these wilderness in a pristine state). In a similar analysis for the Grand Canyon, the dollar value used was in excess of $20 per household. One could argue that Mt. Rainier, with a national awareness more in tune with Grand Canyon, has similar worth, and the values in the table could be multiplied by some assumed value per household (hh) to establish a valuation for that Park. At the modest value of $1/hh, set at this level because Goat Rocks and Alpine Lakes are not nationally prominent, the value these wilderness represent to the American public are estimated to be three billion dollars if you assume the power plant lifetime is 40 years and a benefits growth rate of 3 percent.

Table 1

DISCOUNTED PRESENT VALUE OF BENEFITS
TOTAL US (96,000,000 HOUSEHOLDS)
(millions of dollars)

	TOTAL NUMBER OF YEARS								
g(%)	10	20	30	40	50	60	70	80	90
0.0	809.8	1,356.9	1,726.4	1,976.1	2,144.8	2,258.7	2,335.7	2,387.7	2,422.8
1.5	862.5	1,538.8	2,069.0	2,484.7	2,810.6	3,066.1	3,266.4	3,423.5	3,546.6
3.0	919.5	1,754.3	2,512.3	3,200.4	3,825.2	4,392.4	4,907.4	5,374.9	5,799.4

initial value of benefits per household: $1
real discount rate: 4%
g: real rate at which benefits grow; given historical growth in real income, a 3% rate would represent a roughly constant share of income.
This information and data table provided by Prof. Dan Hagen, Dept. of Economics, Western Washington University, Bellingham, WA.

unlikely due to low level of VOCs emitted by the CGF and because of the long transport times to the closest nonattainment areas.

6.1.5 ADDITIONAL IMPACT ANALYSIS

Attachment to Comment GG5-3

PSD regulations require additional impact analyses to assess the influence of the CGF on the Air Quality Related Values (AQRV) in Class I areas. The AQRVs of concern in Class I areas include visibility, soil, flora, fauna and water. The additional impact section also provides qualitative discussion concerning the growth associated with the facility and construction impacts.

6.1.5.1 ASSESSMENT OF AIR QUALITY RELATED VALUES FOR CLASS I AREAS

This section provides an assessment of the secondary impacts to Class I areas from the CGF. The Clean Air Act through the PSD program provides special protection for pristine areas and requires applicants to meet strict air quality increments. The AQIA addressed the Class I increments and concluded that emissions from the CGF and other increment consuming sources will not cause these increments to be exceeded. However, the National Park Service (NPS) and U.S. Forest Service (USFS) as the Federal Land Managers for the Class I areas have the responsibility of ensuring that AQRVs in the Class I areas are not adversely affected regardless of whether the Class I increments are maintained. AQRVs include plume visibility, regional visibility or haze, the effects of primary and secondary pollutants on sensitive plants, and other effects associated with secondary aerosol formation.

The closest Class I area is Mt. Rainier National Park, approximately 80 km from the facility. Mt. Rainier National Park is the only Class I area within 100 km of the site, the usual limit for consideration of AQRV impacts (NPS, 1993). At the request of Ecology, other Class I areas within 160 km were also considered including Mt. Hood Wilderness, Mt. Adams Wilderness, Goat Rocks Wilderness, Alpine Lakes Wilderness, Olympic National Park, and the Columbia River Gorge National Scenic Area (proposed).

Summary of Findings

AQRVs including visibility or plume blight, regional visibility or haze, the effects of primary and secondary pollutants on sensitive plants and soils, and other effects associated with secondary aerosol formation were assessed for Class I areas within 160 km of the CGF. The screening analysis employed was designed to provide very conservative estimates of secondary aerosol formation, deposition flux, and extinction coefficients for visual range. The procedures did not consider removal mechanisms which reduce the concentrations of both the primary pollutants and secondary aerosol products at such transport distances. The procedure also assumed that ambient conditions were conducive to secondary aerosol formation and that sufficient ammonia would either exist within the plume or be entrained into the plume.

Concentrations of SO_2 and NO_2 predicted for the Class I areas were a small fraction of the USFS recommended levels for the protection of sensitive vegetation. The deposition of secondary aerosols from the facility were also less than USFS criteria for significant impacts to soils in these pristine areas. Based on USFS criteria, acidification of aquatic resources is not expected. While the cumulative effects of other existing sources were not considered in this analysis, the magnitude of the predictions from the CGF were generally insignificant and are not expected to cause or contribute to the injury of the terrestrial ecosystems within the Class I areas.

The series of consecutive conservative assumptions applied in the screening procedures indicated that secondary aerosols that may be formed by emissions from the CGF when fired by No. 2 fuel oil have the potential to affect regional visibility. However, the plume blight analysis indicates compliance with visibility screening criteria, implying the plume will not be perceptible or objectionable for lines of sight within the Class areas and for vistas outside the Class I areas.

Screening Procedures

The dispersion modeling techniques used to assess Class I area AQRVs followed the same basic procedures applied to assess the Class I increments in the AQIA. IWAQM recommendations for modeling long range transport and regional visibility were followed using the conservative guidelines specified for a Level I screening analysis (IWAQM, 1993). The IWAQM screening analysis was designed to provide conservative estimates of secondary aerosol formation, deposition flux, and extinction coefficients for visual range. The conventional steady-state ISC2CMPX model provides high estimates of concentrations at distances beyond 50 km provided secondary aerosol formation have been accounted for in the emission rate of the simulated source. The Level I analysis was conducted with ISC2CMPX using the onsite meteorological data and the other input data as described in the AQIA. Modifications to the ISC2CMPX input files necessary for conservative estimates of long range transport and secondary aerosol formation are discussed below for the acid deposition and regional visibility analyses.

In addition to the regional visibility analysis which considered changes in visual range, the potential visual impact of the project's plume as seen from Class I area vantage points was assessed. Plume blight was assessed using the EPA's plume visibility screening procedures embodied in the VISCREEN model (EPA, 1988). VISCREEN assesses whether a plume is perceptible or objectionable under "reasonable worst case conditions" to untrained observers. Plume blight for lines of sight within the Class areas and for vistas outside the Class I areas were considered. The VISCREEN analysis was conducted using combinations of meteorological variables selected from the onsite meteorological program based on their joint frequency of occurrence and considered the influence of complex terrain. The results of the VISCREEN analysis follows.

Soils and Vegetation

The effects of emissions from the facility on soils and vegetation within Class I areas was assessed by comparing predictions of pollutant concentrations and pollutant deposition fluxes with the criteria specified by the USFS in *Guidelines for Evaluating Air Pollution Impacts on Class I Wilderness Areas in the Pacific Northwest* (USFS, 1992). Concentration predictions for SO_2 and NO_2 were obtained used the methods described in the AQIA. These techniques do not consider pollutant removal, conversion to secondary aerosols, and assume transport for each hour is governed by steady-state meteorological conditions. These assumptions are expected to produce conservative predictions of pollutant concentrations in the Class I areas.

Table 6.1-30 indicates the highest predicted 3-month average and 24-hour concentrations predicted for the Class I areas using annual Scenario B and 24-hour maximum emissions from the oil-fired turbines (at 100 percent load), respectively. The predictions were based on 38 receptors with elevations set to 800 feet, near the expected level of maximum impacts from the dispersion model employed. The higher Class I area concentration predictions occurred in the Mt. Adams Wilderness and the proposed Columbia River Gorge Scenic Area. These areas are located in the downwind sectors most affected by prevailing winds at the site.

In order to maximize the protection of all plant species, the USFS recommends that maximum SO_2 concentrations should not exceed 40 to 50 ppb (105 to 130 $\mu g/m^3$), and annual SO_2 concentrations should not exceed 8 to 12 ppb (21 to 31 $\mu g/m^3$). Lichens and bryophytes are found in the subalpine and alpine regions of several of the Class I areas. Some of these species may be sensitive to SO_2 concentrations in the range of 5 to 15 ppb (13 to 39 $\mu g/m^3$)(USFS, 1992). The USFS also indicates that no significant amount of injury to plants species in the Pacific Northwest are expected for annual NO_2 concentrations less than 15 ppb (28 $\mu g/m^3$).

The concentrations predicted for the Class I areas were a very small fraction of these recommended levels. While the cumulative effects of other existing sources have not been considered in this analysis, the magnitude of the predictions from the CGF were insignificant and are not expected to cause or contribute to the injury of plant species within the Class I areas.

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TABLE 6.1-30
MAXIMUM PREDICTED SO_2 AND NO_2 CONCENTRATIONS
IN CLASS I AREAS

Class I Area	Maximum Annual Concentration [a]		Maximum 24-Hour Concentration [b]	
	NO_2 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	SO_2 (µg/m³)
Mt. Rainier Nat Park	0.038	0.014	1.507	0.516
Goat Rocks Wild Area	0.056	0.021	1.572	0.538
Mt. Adams Wild Area	0.092	0.035	1.732	0.593
Columbia River Scenic	0.093	0.035	2.084	0.713
Olympic Nat. Park	0.057	0.021	1.631	0.558
Alpine Lakes Wild Area	0.025	0.010	1.430	0.489
Mt. Hood Wild Area	0.046	0.017	1.234	0.422
Maximum	0.093	0.035	2.084	0.713
US Forest Service criterion	28	21-31		105-130

[a] Annual impacts based on operating Scenario B
[b] 24-hour impacts based on oil-fired turbines

The effect of the facility on soils and aquatic resources in the Class I areas was assessed by calculating annual deposition fluxes. The deposition of secondary aerosols to Class I areas followed the conservative procedures outlined by IWAQM. The Level I screening procedures assume all NOx is converted to nitric acid (HNO3) and deposited as an aerosol, and SO2 is deposited as a gas. Although deposition is assumed to occur within the Class I area, removal mechanisms upwind of these areas are ignored by the procedure. Annual deposition fluxes were calculated from the product of a deposition velocity and the annual concentrations predicted for HNO3 (NOx concentration converted for the change in molecular weight) and SO2. IWAQM recommends 0.005 and 0.05 m/s as the deposition velocities for SO2 and HNO3, respectively.

The acidification of aquatic resources with in the Class I areas was assessed by assuming that all the NO_x and SO_2 deposited above were removed through wet deposition. Assuming no dilution or buffering, the resulting concentrations of nitrate and sulfate expressed in terms of equivalent acidity (μeq/l) were calculated from:

$$NO_3^- \left(\frac{\mu eq}{l}\right) = \frac{DF_{HNO_3}\left(\frac{kg}{ha\ yr}\right) \cdot 10^4 \cdot \left(\frac{1\ \mu eq}{63\ \mu g}\right)}{P\left(\frac{cm}{yr}\right)}$$

$$SO_4^= \left(\frac{\mu eq}{l}\right) = \frac{DF_{SO_4^=}\left(\frac{kg}{ha\ yr}\right) \cdot 10^4 \cdot \left(\frac{2\ \mu eq}{98\ \mu g}\right)}{P\left(\frac{cm}{yr}\right)}$$

where (P) is the annual precipitation and (DF) is the annual deposition flux calculated according to the IWAQM recommendations. Annual precipitation varies among the Class I areas considered in the analysis and due to orographic effects varies greatly within each area. The annual precipitation values used in the calculation of acidification were selected to reflect the general trend in regional rainfall, but are expected to underestimate annual precipitation areas at high elevations and on western slopes of these areas. Conversely, eastern slopes of mountain ranges and lower elevations tend to receive less annual precipitation than indicated.

Predictions of annual deposition to Class I areas are presented in Table 6.1-31. The USFS indicates that annual sulfur deposition fluxes below 5 kg/ha/yr are unlikely to significantly affect the terrestrial ecosystems of Pacific Northwest forests. Deposition of sulfur associated with emissions from the CGF was predicted to be two orders of magnitude below this criteria and insignificant. The USFS also suggests that total nitrogen deposition below 3 to 5 kg/ha/yr should cause no injury, and a rate of 3 to 20 kg/ha/yr has the potential for some injury to plants and forest ecosystems. Using the conservative IWAQM Level I techniques, the highest total nitrogen deposition was predicted to be about 0.4 kg/ha/yr in the Mt. Adams Wilderness and Columbia River Gorge Scenic Area. Existing annual deposition fluxes of total nitrogen to the Mt. Adams Wilderness have been estimated at 4.1 to 4.5 kg/ha/yr, the highest of the Class I areas considered in the present analysis (USFS, 1992). The total cumulative nitrogen deposition including background will then be about 5 kg/ha/yr, near the USFS's lower limit for potential effects.

Sulfate and nitrate are the anions most associated with acidification of aquatic resources. The USFS indicates that changes in sensitive water bodies of sulfate concentrations by less than 5 μeq/l and by nitrate concentrations by less than 1 μeq/l are insignificant. With the exception of the Columbia River Gorge Scenic Area and the Mt. Adams Wilderness, these criteria were met using the conservative IWAQM Level I procedures. Predicted nitrate concentrations in precipitation or runoff were above the 1 μeq/l criteria for the Mt. Adams Wilderness and Columbia River Gorge Scenic Area. Relatively higher predictions occurred because pollutant

concentrations were relatively higher and because the diluting effects of annual precipitation was less evident in the above equations. Most wilderness lakes in the Pacific Northwest have no measurable nitrate (USFS, 1992). The nitrate contained in the rainfall or runoff predicted in the present analysis will be diluted by many orders of magnitude by the existing water bodies and the USFS screening criteria are expected to be satisfied.

TABLE 6.1-31
PREDICTIONS OF ANNUAL DEPOSITION FLUX TO CLASS I AREAS

Class I Area	Maximum Annual Deposition Flux (kg/ha/yr) [a]				Precip. (in/yr)	Sulfate (ueq/l)	Nitrate (ueq/l)
	SO_2	HNO_3	Sulfur	Nitrogen			
Mt. Rainier Nat Park	0.02	0.83	0.01	0.18	100	0.03	0.52
Goat Rocks Wild Area	0.03	1.21	0.02	0.27	100	0.04	0.76
Mt. Adams Wild Area	0.05	1.99	0.03	0.44	50	0.13	2.49
Columbia River Scenic	0.06	2.01	0.03	0.45	50	0.14	2.51
Olympic Nat. Park	0.03	1.23	0.02	0.27	100	0.04	0.77
Alpine Lakes Wild Area	0.02	0.55	0.01	0.12	100	0.02	0.34
Mt. Hood Wild Area	0.03	1.00	0.01	0.22	75	0.04	0.83
Maximum	0.06	2.01	0.03	0.45		0.14	2.51
USFS Recommended Criterion			5	3-5		5	1

[a] Annual emissions based on operating Scenario B

Plume Blight Analysis

Screening techniques were applied to assess whether the plume from the CGF will be perceptible while looking at vistas outside or within the Class I areas. The screening procedures recommended by the EPA are contained in the VISCREEN model (EPA, 1988). Input variables required for the application of VISCREEN include PM10 and NO_x emission rates, background ozone concentration, background visual range, worst-case meteorology, particle size distribution, minimum and maximum distances to the Class I area, and plume-source-observer configuration. A background visual range of 160 km was assumed for all Class I areas based on Ecology guidance. Plume to receptor geometries were selected from the 100,000 USGS maps indicating the boundaries of the Class I areas, using the methods outlined for application of VISCREEN. With the exception of the worst-case meteorological data, all other input variables were based on the default values specified for a Level I screening analysis.

Preliminary applications of VISCREEN using Level I meteorological defaults exceeded the visual screening criteria contained in the model. These conditions are considered overly conservative by the EPA when long transport times are involved, when complex terrain occurs between the source and the Class I area, or when the assumed combination of worst-case stability, wind direction, and wind speed are infrequent.

The onsite meteorological database was analyzed to assess worst-case transport conditions from the site to each Class I area based on EPA recommendations for a Level II VISCREEN application (EPA, 1988). A stability wind rose was constructed from the dispersion model input file based on the onsite meteorological data and the joint frequency of different combinations of wind speed, wind direction, and stability class calculated. Each meteorological combination was then ranked according to the procedures outlined by the EPA using wind speed and the vertical dispersion parameter calculated as a function of stability class and distance to the Class I area. The worst dispersion condition (combination of wind speed, wind direction, and stability class) that both allows transport to the Class I area in under 12 hours, and has a frequency of greater than 1 percent in the meteorological data set was used in the Level II analysis. In some instances, the Class I areas were located in offwind directions where stable conditions were relatively infrequent. Strict adherence to EPA's 1 percent criteria would have resulted in simulations with unstable meteorology, high winds, or would have dropped consideration of transport to the Class I area entirely. In these cases, average conditions at the site specified by a wind speed of 3.5 m/s and neutral conditions were assumed for the VISCREEN application.

The EPA allows the Level II analysis to consider the ramifications of complex terrain when the plume must travel over "elevated terrain" to reach the Class I Area. In this context, elevated terrain is defined by the EPA as 500 m above the final plume height. Typical final plume heights under stable conditions were predicted in the AQIA to be about 800 feet (250 m), so "elevated terrain" refers to elevations above 750 m. Topographic maps were consulted and it was established that such terrain blocked the trajectories for every Class I area. Level II corrections to account for complex terrain were applied and stable atmospheric classifications used by VISCREEN were adjusted one class lower. Neutral conditions were not adjusted one class lower. The meteorological data used in the VISCREEN analysis after correction for complex terrain are shown in Table 6.1-32.

TABLE 6-1-32
VISCREEN METEOROLOGICAL DATA COMBINATIONS

Class I Area	Closest Distance to Class I Area (km) (a)	Wind Direction Affecting the Class I Area (degrees)	Atmospheric Stability (a)	Wind Speed (m/s) (b)
Mt. Hood Wilderness	160	NNW	D	3.5
Columbia River Scenic Area	127	NW, NNW	E	3.5
Mt. Adams Wilderness	109	WNW	D	3.5
Goat Rocks Wilderness	102	W	E	3.5
Mt. Rainier National Park	77.9	WSW	D	3.5
Alpine Lakes Wilderness	137	SW	D	3.5
Olympic National Park	104	SSE, SE	D	2.5

(a) Stability class was lowered by one class to account for elevated terrain between the site and the Class I areas

(b) Wind speed and atmospheric stability class were not allowed to be more conducive to dispersion than the combination of Class D (neutral) and 3.5 m/s

For vistas inside and outside the Class I area VISCREEN assesses plume contrast and perceptibility criteria using two backgrounds (sky and terrain) and for two positions of the sun (directly behind and in front of the observer). The criteria are assessed by varying the line of sight from the observer to the vista. For vistas within the Class I area, VISCREEN limits the potential lines of sight to correspond to the boundaries of the area. For scenic views from the Class I area to outside targets, VISCREEN considers the remaining lines of sight including a case where the observer looks directly back at the source. VISCREEN does not check whether the lines of sight considered and the position of the sun represent physically realistic possibilities.

The results of the VISCREEN application are shown in Table 6.1-33 assuming the CGF was burning No. 2 fuel oil as a standby fuel at the maximum 24-hour rate. Under these worse case emission conditions, the facility passed the VISCREEN screening criteria for plume perceptibility (ΔE) and plume contrast for all potential vistas within each Class I area (i.e., where the viewer is within a Class I area looking at another location within the Class I area). The CGF also passed the screening criteria for integral vistas (where the viewer is inside the park looking out).

The VISCREEN procedures were also applied to maximum 24-hour emissions from gas-fired turbines. The results shown in Table 6.1-34 indicate the plume from the CGF under reasonable worst-case conditions will not be perceptible or visually significant.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

5/17/95

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG #: RCP-04-096
RECEIPT DATE: 5/22/95
AREA: DISTRICT

REPLY TO
ATTN OF: WD-126

Dawn R. Boorse
Environmental Project Manager
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

Re: **Bonneville Power Administration's (BPA) Resource Contingency Program Draft Environmental Impact Statement (EIS)**

Dear Ms. Boorse:

The Environmental Protection Agency has reviewed the draft EIS for BPA's Resource Contingency Program. Our review was conducted in accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act. We appreciate the opportunity to review this project and provide comments at this time.

This draft EIS addresses three proposed alternatives: the proposed action, no action, and other actions. The proposed action is the acquisition of power from all three plant sites (Chehalis-WA, Satsop-WA, Hermiston-OR). This draft EIS was prepared to address environmental effects of constructing and operating all three projects.

GG6-1

Based on our review, we have rated the draft EIS EO-2 (Environmental Objections, Insufficient Information). Our review has identified significant environmental impacts for the proposed action. Our environmental objections are based on: anticipated negative impacts to the water quality limited section of Chehalis River and potential impacts to waters of the U.S., including wetlands.

Additional Information is requested to: clarify alternatives to the proposed action; clarify proposed mitigation measureS for water quality impacts; describe the effectiveness of mitigation measures; describe project monitoring in more detail; and describe and fully evaluate cumulative impacts.

An explanation of our rating system for draft EISs is enclosed for your reference. This rating and a summary of our comments will be published in the Federal Register.

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GG6-1 Comments noted. See responses to comments GG6-6, GG6-7, GG6-12, GG6-13, GG6-14, GG6-15, GG6-16, GG6-17, and GG6-21.

If you have any questions about our comments (enclosed), you may contact Larry Brockman in Seattle at (206) 553-1750. We appreciate this opportunity to review and comment on the draft EIS.

Sincerely,

Daniel Steinborn

Daniel Steinborn, Acting Chief
Program Coordination Branch

Enclosure

SUMMARY OF THE EPA RATING SYSTEM
FOR DRAFT ENVIRONMENTAL IMPACT STATEMENTS:
DEFINITIONS AND FOLLOW-UP ACTION *

Environmental Impact of the Action

LO--Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA intends to work with the lead agency to reduce these impacts.

EO--Environmental Objections

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3--Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment

February, 1987

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
COMMENTS REGARDING
BPA'S RESOURCE CONTINGENCY PROGRAM
ENVIRONMENTAL IMPACT STATEMENT

Alternatives

GG6-2 The alternatives section of an EIS is considered the heart of an EIS. EPA is concerned with the lack of alternatives analysis included in the draft EIS.

Section 1500.2(e) of the Council on Environmental Quality (CEQ) regulations state, "Use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." It follows, according to section 1502.14 of the CEQ regulations, that agencies shall:

> (a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.
>
> (b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.
>
> (c) Include reasonable alternatives not within the jurisdiction of the lead agency.
>
> (d) Include appropriate mitigation measures not already included in the proposed action or alternatives.

GG6-3 The draft EIS indicates the proposed action is acquisition of power, if and when power is needed. However, this document does not indicate what type of power need (peaking, mid-range or base-load) BPA may be trying to meet by purchasing options to acquire this power. The type of power that may be needed, would define the types of alternatives that should be evaluated. The final EIS should indicate, if in fact there is a type of power that will be needed and then develop alternatives accordingly. Presently, the draft EIS does not rigorously explore or

GG6-4 evaluate any alternative to the proposed action. Other alternatives should be evaluated in the final EIS or a supplemental draft EIS so decision-makers and the public can identify the least environmentally damaging option.

GG6-5 Page 1-3 indicates BPA solicited requests for energy options in May, 1992. Based on that request, a total of 64 proposals were submitted to BPA and subsequently evaluated for project viability, cost effectiveness, and environmental impacts. The Hermiston, Chehalis and Satsop proposals were selected as the three projects best meeting these above criteria. EPA requests the final EIS thoroughly discuss the process and framework by which these sites were chosen. Specifically, please indicate if the process was entirely an internal evaluation conducted by BPA,

GG6-2 See response to GI1-1.

GG6-3 The RCP option projects could be used to meet a whole range of energy needs. In general, this EIS examines the worst case analysis of the projects in a baseload operation mode. In reality, these resource options could be used for a whole range of types of energy deficits such as winter peaking and load following operations. As part of the evaluation process, resources that offer operational flexibility were more highly valued in the selection process. CT's are particularly valuable for their ability to offer flexibility to follow loads and start-up/shut-down quickly, and economically unlike renewable resources and coal and nuclear resources which are slow to start-up/shut down and/or it is economically infeasible to do so. See sections 1.3 and 1.4 of the Resource Program EIS for further discussion on resource energy needs.

GG6-4 See response to GI1-1.

GG6-5 BPA has expanded Section 1.1.3 Background to include more discussion of the RCP selection process for the three optioned projects. However, because each of these projects where evaluated independently they are not alternatives to one another and they are not connected, cumulative or similar actions, to the extent the agency needs to examine them in a single NEPA document.

GG6-5 (cont.) or whether the public and resources agencies had an opportunity to comment on selection of these sites. Also, the final EIS should provide information on how to obtain a copy of the evaluation document(s) used in selecting these three projects from the 64.

GG6-6 For each of the three proposed projects, the final EIS should discuss alternatives that will avoid or minimize adverse environmental impacts. For example, alternatives to routing of gas and water pipelines should be discussed. As mentioned above, NEPA requires analysis of alternatives for avoiding environmental impacts. Each of these projects will likely need an Army Corps of Engineers (Corps) Clean Water Act (CWA) §404 permit which also requires an alternative analysis (See below for more details regarding the 404 permit).

Water Quality

Surface Water

GG6-7 It is the goal of the CWA to restore and maintain the chemical, physical and biological integrity of the nation's waters. The final EIS must clearly demonstrate that the implementation of any of the three proposed generation facilities will comply with state Water Quality Standards. State Water Quality Standards establish designated uses for a water body (or water body segment), support the uses with numeric or narrative water quality criteria, and protect the uses with an antidegradation policy. The final EIS should list the designated uses of any affected waters, and it should fully disclose all water quality impacts on these waters.

GG6-8 EPA is particularly concerned with potential water quality impacts on the Chehalis River. Due to excessive plant growth, high temperatures and bacteria, the Chehalis River is presently designated as "water quality limited" by the State of Washington. The Chehalis River is already extremely stressed due to summer low flows and high BOD loading; further reduction of water quantity could result in major impacts to aquatic resources. It is EPA's position that federal actions should not undertake or allow any activity that would contribute to further water quality degradation to a CWA section 303(d) listed water body. EPA considers any such action as significant and will not support the proposal.

GG6-9 The proposed Chehalis Generation Facility (CGF) could require up to 3 million gallons of water per day. The draft EIS states groundwater could be used to mitigate impacts on water quality. However, it is our understanding the use of groundwater to augment flows to the Chehalis River is no longer being considered due to negative impacts associated with groundwater withdrawal.

GG6-6 The project developer is aware of the potential need for a Section 404 permit. A wetland delineation was performed in the spring of 1995 and has been reviewed and accepted by the Oregon Division of State Lands. The Corps of Engineers will be invited to field verify the wetland delineation and make a determination of jurisdiction at a later date. A copy of the HPP wetland delineation report has been provided to the Corps of Engineers June 14, 1995.

A map depicting wetlands potentially affected by the project components has been added to Section 3.5 Vegetation/Wetlands.

Also Section 4.5 Vegetation/Wetlands has been expanded to provide more discussion of wetland impacts and mitigation, including avoidance measures.

GG6-7 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.

GG6-8 Refer to RCP—Washington FEIS for response.

GG6-9 Refer to RCP—Washington FEIS for response.

GG6-10 Another proposed option to mitigate water quality impacts is the use of reclaimed wastewater from the City of Chehalis's wastewater treatment plant (WWTP). The CGF would treat wastewater and then discharge into the Chehalis River through the existing WWTP outfall line. The draft EIS further states, because the proposed project would discharge a smaller quantity of reclaimed water to the river than the project receives from the WWTP, the BOD loading discharged to the river would be reduced and impact on water quality would be low. EPA agrees the BOD loading may in fact be lower and would likely have a positive effect on DO levels. However, over all water quantity discharged to the Chehalis River would be significantly less, (i.e., water loss due to evaporation) which would likely increase temperature and decrease dissolved oxygen (DO) levels. The final EIS should address this particular issue. Moreover, the final EIS should provide a quantitative basis to judge whether physical and chemical parameters, such as temperature, DO and metals (mercury, cadmium, lead, silver) will be kept at levels that will protect and fully support designated uses and meet Water Quality Standards under each of the projects, not just the CGF.

GG6-11

Wetlands/Waters of the U.S.

Wetlands are one of a number of "Special Aquatic Sites" referenced in the CWA section 404(b)(1) Guidelines. These Guidelines provide the substantive environmental criteria for protecting waters of the U.S. under section 404 of the CWA. Wetlands are significant environmental resources that provide a wide range of important functions and values. They have experienced severe cumulative losses nationally. For these reasons protection of wetlands and other important aquatic resource habitats is a high EPA priority.

GG6-12 For purposes of section 404 permits where dredge or fill activity is proposed in waters of the U.S., all aquatic resource areas, including wetlands, should be clearly identified and assessed in relation to project affects. Presently the EIS does not clearly show the location of the wetlands likely to be affected. The final EIS should include maps outlining the location of the wetlands and the routing of roads, pipelines or facilities impacting wetlands. Specifically, wetlands in the project area should first be identified and delineated consistent with the Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, January 1987, Final Report and its recent guidance on implementation. Delineation should be followed by a functional assessment to determine the extent and importance of existing wetland and aquatic resources. Several options such as the Wetland Evaluation Technique are available for use in determining wetland and associated aquatic resources functions and their values. Any special features such as rare or unique habitats should receive special attention.

GG6-13 Once the wetland functions and values are defined, the possibilities for mitigating potential effects can be explored. Planning and design should seek to

GG6-10 Refer to RCP—Washington FEIS for response.

GG6-11 Process wastewater from the HPP cogeneration facility would be discharged to the J.R. Simplot process water agricultural recycle system. Simplot currently recycles potato process water on farm land in the vicinity of their plant site. Process water is applied to farm land to provide beneficial use of water and nutrients. Sanitary wastewater from the HPP cogeneration plant would be discharged to Simplot's existing sanitary wastewater treatment system. Simplot's existing sanitary system consists of a two cell facultative lagoon/evaporation unit, chlorinator, and agricultural irrigation system.

Simplot process water and sanitary wastewater are land applied under a State of Oregon Water Pollution Control Facilities (WPCF) permit issued by the Oregon Department of Environmental Quality (DEQ). The Oregon DEQ required that the Hermiston Power Partnership assess potential water quality impacts associated with agricultural recycling of combined process water (process water from the Simplot processing plant and the cogeneration plant) as part of an application for amendment to the J.R. Simplot WPCF permit to allow incorporation of the HPP cogeneration effluent.

HPP contracted Cascade Earth Science Ltd (August 1994) to prepare an assessment of the potential effects of cogeneration plant discharges on Simplot's process water and sanitary wastewater systems in support of the application for WPCF permit amendment. The study evaluated the potential effect of nutrients and salts/crop micronutrients, trace inorganic elements, and trace organics in Cmix (combined Simplot process water plus cogeneration plant water) water on soils, plants, and groundwater.

Utilizing Cmix water as a nutrient and moisture source in farming is an established practice used by a large segment of the food processing industry (Smith and Peterson, 1982). However, Cmix water, like most commercial fertilizers and soil amendments utilized on farms, contains nutrients, salts, and oxygen-demanding materials that can degrade water resources if not properly managed. As a result, Cmix water must be irrigated in a controlled manner. Because sanitary wastewater and Cmix water are kept separate, Cmix water is free of human pathogens. Cmix water contains appreciable amounts of nitrogen, phosphorus, potassium, and sulfur as well as soil-building organic matter that can benefit crop production when applied at rates consistent with the crop(s) being grown. Cmix concentrations are based on the existing Simplot process water and the projected cogeneration plant water combined (on volume and mass basis). It is important to note that during the growing season Cmix water will be mixed on a volume and mass basis with supplemental freshwater.

Data shown in Table 9 were used to estimate the concentrations and mass loads of selected constituents to the Simplot process water system. Note that no concentrations were shown for constituents which were below laboratory method detection limits.

Table 9. Projected Discharge Quality, Concentration, and Mass Basis of Mixed Simplot and Cogeneration Plant Process Water to be Recycled on Agricultural Land

Parameter	Simplot Existing Process Water mg/L[1]	Power Plant Process Water mg/L[2]	Average Supplemental Fresh Water mg/L[3]	Mixed Process Water mg/L[4]	Mixed Process Water lbs/yr[5]
Acrylate Copolymer	-	5.78	-	0.81	3,708
Aluminum	-	1.08	-	0.15	687
Barium	-	0.20	-	0.03	137
Bicarbonate	892	317.40	243	757.56	3,467,978
Calcium	24	167.60	30	44.05	201,653
Chemical Oxygen Demand	441	-	30	379.42	1,736,919
Chloride	85	61.20	24	81.68	373,917
Copper	-	0.63	-	0.09	412
Cyclohexlyamine	-	0.01	-	0.001	5
Iron	-	1.22	-	0.17	778
Magnesium	41	-	8	35.27	161,460
Morpholine	-	0.25	-	0.03	137
Nitrate-Nitrogen	3	0.00	1	2.58	11,811
Phosphorus	32	-	-	27.53	126,034
Potassium	223	-	7	191.86	878,302
Polymer as SCP	-	6.44	-	0.90	4,120
Silica	-	108.70	-	15.18	69,491
Sodium	71	66.20	41	70.33	321,959
Strontium	-	9.00	-	1.26	5,768
Sulfate	19	323.70	3.5	61.55	281,765
Tolyltriazole	-	1.73	-	0.24	1,099
Total Dissolved Solids	1,215	1,110.00	360	1,200.34	5,494,948
Total Kjeldahl Nitrogen	113	-	1	97.22	445,056
Total Phosphorus	32	10.90	1	29.05	132,986
Zinc	-	0.43	-	0.06	275

NOTE:
"-" = No data (assumed to be 0.00 mg/L).

[1] Provided by Betz Industrial and Parsons Brinckerhoff (see Table 8).

[2] Supplemental fresh water estimated from combined surface water and groundwater sources.

[3] Process water mean values for January 1993 through December 1993 (CES, 1993).

[4] Calculated by:

$$\text{Mixed Process Water} = \frac{C_1 \times Q_1 + C_2 \times Q_2}{Q_1 + Q_2}$$

where: Mixed Process Water = Concentration of the constituent (mg/L) in the combined process water streams.

C_1C_2 = Concentration of the constituent (mg/L) in Simplot's existing process water and Cogeneration plant process water.

Q_1Q_2 = Projected discharge volume (MG/yr) of Simplot's existing process water and Cogeneration plant process water.

[5] Rounded to nearest pound. Values derived by: Million Gallons of Process Water to be Produced (about 548.90 MG/yr) x 8.34 x mg/L of constituent.

Source: "Statement of Knowledge and Work Plan for Process Water Recycling System and Sanitary Wastewater Treatment," prepared by Cascade Earth Sciences, Ltd., August 1994.

Trace Inorganic Elements

Trace inorganic elements are a group of chemical elements that occur in the natural environment in low concentrations. Some of these elements (e.g., Cr, Mn, Ni, Cu, Zn, Se) are essential to biological growth. Table 9 shows that Cmix water to be recycled at Simplot is projected to contain small amounts of Al, Ba, Cu, Sr, and Zn. Cmix concentrations of trace metals would be further reduced due to supplemental fresh water use. Table 10 shows most Cmix water trace element concentrations would be below those found in municipal wastewaters. Unlike typical municipal wastewater treatment plant sludges, Cmix water to be land applied would contain lower levels of trace elements than do native plants and soils.

In 1972, the National Academy of Sciences and National Academy of Engineering, developed irrigation water quality standards (National Academy of Sciences, 1972). These standards are shown in column 3 of Table 14. Levels specified are considered safe for indefinite applications on all soil types (acid and alkaline soils) and crops at a hydraulic loading of 4 acre-feet per year per acre. As shown in Table 14, projected HPP process water quality meets these standards.

In February 1993, the U.S. EPA issued standards for the use of sewage sludge (U.S. EPA, 1993). These standards are shown in column 4 of Table 14. Levels specified are considered safe for indefinite applications of liquid sludge (one percent solids) on all soil types and crops at agronomic rates. These standards were developed by the U.S. EPA to prevent not only adverse impacts to plants but also to groundwater, humans, and animals. As shown in Table 14, projected Cmix water quality complies with these standards.

In summary;

1) Cmix water to be recycled on Simplot agricultural land is projected to contain low and acceptable concentrations of trace elements: Al, Ba, Cu, and Zn.

2) Trace elements applied to soils should exhibit low mobility as soils at the site are neutral to alkaline and aerobic. These soil characteristics promote adsorption, chelation, and precipitation of trace elements.

3) Standards developed by the U.S. EPA and the National Academy of Sciences and National Academy of Engineering indicate trace elements in the Cmix should not adversely affect soils, plants, animals, or groundwater.

Trace Organics

Thousands of trace organics exist. Surveys have shown that phthalate esters, monocyclic aromatics, polynuclear aromatics, halogentated biphenyls, dioxins, halogenated aliphatics, triaryl phosphate esters, aromatic and alkyl amines, phenols, chlorinated pesticides and hydrocarbons and others may occur in municipal

Table 10. Comparison of Projected Cmix Water Trace Element Levels to Trace Element Levels Normally Found in Municipal Wastewater

Trace Element	*Cmix Water Concentration[1] (mg/L)*	*Municipal Wastewater Concentration[2] (mg/L)*
Aluminum (Al)	0.15	-
Arsenic (As)	ND	<0.005
Barium (Ba)	0.03	-
Beryllium (Be)	ND	-
Cadmium (Cd)	ND	<0.005
Chromium (Cr)	ND	0.02
Copper (Cu)	0.09	0.04
Lead (Pb)	ND	0.008
Manganese (Mn)	ND	0.12
Mercury (Hg)	ND	<0.0005
Nickel (Ni)	ND	0.004
Selenium (Se)	ND	0.005
Strontium (Sr)	1.26	-
Thallium (Ti)	ND	-
Zinc (Zn)	0.06	0.04

Notes:
"ND" = Non-detectable levels projected.
[1] Based on estimated volume and concentration data for Simplot process water combined with cogeneration plant water (Table 9). Does not include supplemental fresh water used for crop irrigation (see Section 5.4).
[2] Median concentration for secondary effluent. Data from Pettygrove and Asano (1986).

Source: "Statement of Knowledge and Work Plan for Process Water Recycling System and Sanitary Wastewater Treatment," prepared by Cascade Earth Sciences, Ltd., August 1994.

Table 14. Comparison of Projected Cmix Water Trace Element Levels to Maximum Trace Element Levels in Irrigation Waters and Municipal Wastewater Sludges Considered Suitable for Indefinite Use of All Soil Types and Crops

Trace Element	*Cmix Water Concentration*[1] *(mg/L)*	*Maximum Recommended Limits for Irrigation Waters*[2] *(mg/L)*	*Federal Limits for Liquid Municipal Wastewater Sludges*[3] *(1% Solids) (mg/L)*
Aluminum (Al)	0.15	-	-
Antimony (Sb)	ND	-	-
Arsenic (As)	ND	0.10	0.41
Barium (Ba)	0.03	-	-
Beryllium (Be)	ND	0.10	-
Cadmium (Cd)	ND	0.01	0.39
Chromium (Cr)	ND	0.01	12
Copper (Cu)	0.09	0.20	15
Lead (Pb)	ND	5.0	3
Manganese (Mn)	ND	0.20	-
Mercury (Hg)	ND	-	0.17
Nickel (ni)	ND	0.20	4.2
Selenium (Se)	ND	0.02	0.36
Strontium (Sr)	1.26	-	-
Thallium (Ti)	ND	-	-
Zinc (Zn)	0.06	2.0	28

Notes:
"-" = No data available.
"ND" = Non-detectable levels projected.
[1] Based on estimated volume and concentration data for cogeneration plant (Table 9).
[2] Data from Pettygrove and Asano (1986), and University of Idaho Soils Handbook (1988).
[3] Adapted from U.S. EPA 40 CFR Part 503 (February 1993).

Source: "Statement of Knowledge and Work Plan for Process Water Recycling System and Sanitary Wastewater Treatment," prepared by Cascade Earth Sciences, Ltd., August 1994.

wastewaters and sludges (Page et al., 1987; U.S. EPA, 1981 and 1983). In general, trace organics in municipal wastewaters and sludges have not been identified as a problem to plants, soils, and groundwater at land application sites.

Studies indicate trace organics commonly found in municipal wastewaters and sludges upon application may be sorbed, degraded, or volatilized in the soil system (Brown et al., 1983; Pettygrove and Asano, 1986; Overcash and Pal, 1979; and U.S. EPA, 1981 and 1983). Some of the organics may also be taken up by the crop. Acrylage copolymer, cyclohexylamine, tolytriazone, and morpholine have been identified as organic compounds that may occur in process water. Each of these compounds are constituents found in corrosion or algal/fungal inhibiting formulations to be utilized in boilers associated with the cogeneration plant. Cmix concentrations of these constituents are shown in Table 9. Most organic compounds applied to soils at low concentrations are readily sorbed and/or degraded. This in particularly true where soil conditions are favorable and good agricultural management is practiced, such as on Simplot sites.

The U.S. EPA does not regulate trace organics in land applied wastewaters and sludges. Further, the Oregon DEQ and most other states have not adopted standards for organics in wastewaters or sludges recycled on land.

In summary;

1) In Cmix water, as compared to existing process water, concentrations of some trace organics will increase by a small percentage.

2) No adverse effects on crops or soils on Simplot sites are anticipated due to trace organics.

The Oregon Department of Environmental Quality, Water Quality Division (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.

GG6-12 Comments acknowledged. The locations of wetlands potentially affected by the project are shown in the wetland delineation report submitted to the Corps of Engineers on June 14, 1995, and in a new figure titled Wetland Locations, Figure 3.5-1, which has been added in Section 3.5, Vegetation and Wetlands. The wetland delineation was performed in accordance with the Corps of Engineers 1987 manual. No rare or unique habitats associated with wetlands are affected by the project. Section 4.5, Vegetation/Wetlands of the EIS has been expanded to provide more discussion of wetland impacts and mitigation.

GG6-13 (cont.) avoid adverse effects wherever possible, to minimize adverse effects which are unavoidable, and, as a final alternative, to provide adequate compensation for all unavoidable adverse effects. This will require a thorough evaluation of all less environmentally damaging project alternatives. For non-water dependent activities, such as roads, alternatives to siting in wetlands are presumed to be available unless demonstrated otherwise. The 404(b)(1) Guidelines and EPA Wetland Specialists should be consulted for specific guidance on the scope of avoidance and minimization alternatives that need to be addressed.

GG6-14 We recommend coordination with the appropriate Corps District, EPA Wetlands Section, Fish and Wildlife Service, National Marine Fisheries Service and other state and federal resource agencies when developing alternatives to determine whether effects on to waters of the United States can be eliminated or reduced. The need to select alternatives which avoid effects on U.S. waters must be addressed during the 404 permit process. To assure consistency with the 404(b)(1) Guidelines, a thorough analysis of all possible alternatives to avoid and minimize wetland and aquatic resource habitat impacts should be addressed through the NEPA EIS process. These alternatives can include project design changes including pipeline alignment reconfiguration and alternate pipeline water crossings (i.e., tunneling, bridging).

GG6-15 The final EIS needs to discuss alternatives to avoid and minimize wetland or other aquatic resource habitat effects. If the final EIS does not fully address all less environmentally damaging alternatives, it is conceivable that a supplemental EIS may be necessary.

GG6-16 In addition, we recommend that a compensatory mitigation plan be developed and included in the final EIS for unavoidable wetland and aquatic resource effects (see attached Mitigation Plan Requirements). This mitigation plan should include consideration of both direct, indirect, and cumulative effects. It should contain a statement of goals, a monitoring plan, long-term management/protection objectives and a contingency plan (a commitment to conduct additional work if required to meet the goals of the plan).

GG6-17 We suggest BPA meet with resource agencies, including EPA, to discuss mitigation options. To coordinate the wetland and aquatic resource impact aspects of this project, please contact Richard Clark, Wetlands Specialist, at (206) 553-5198 in the Seattle Regional EPA office.

Cumulative Effects

Cumulative impacts are defined as "...the impact on the environment which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions." (40 CFR 1508.7) Presently, the draft EIS

GG6-13, 6-14, and 6-15 The developer has selected pipeline and transmission line routes and pole locations which avoid, minimize, and reduce wetland and aquatic resource habitat impacts. The wetland delineation report demonstrates that the planned fills would not have unacceptable, adverse impacts either individually or in combination. 40 CFR 230 provides the substantive criteria used in evaluating discharges of dredged or fill material applicable to 404 permit decisions.

Section 4.5 Vegetation/Wetlands has been expanded to provide more discussion of wetland impacts and mitigation.

GG6-16 The level of project impacts to wetlands does not justify an extensive compensatory mitigation plan, as described in the wetland delineation report. The project developer has provided a copy of the wetlands delineation report to the Corps of Engineers for evaluation. The Oregon Department of Fish and Wildlife and Oregon Division of State Lands have visited the project site and reviewed the wetlands. The Corps has been invited to field verify the wetland delineation and make a determination of jurisdiction.

Section 4.5 Vegetation/Wetlands has been expanded to provide more discussion of mitigation and monitoring.

GG6-17 The developer has conducted wetland tours for the Oregon Department of Fish and Wildlife, the Oregon Department of State Lands, the Umatilla County Planning Department, and the Oregon Department of Energy and its environmental consultants. The developer has expressed a willingness to meet with EPA and/or Corps and BPA at the project site if they feel it is necessary after review of the wetland delineation and mitigation plans.

GG6-18 only describes impacts associated with each individual project. Two of the three proposed projects are located within the Chehalis watershed. The final EIS should describe potential cumulative impacts on resources within this watershed from these two projects and any other reasonably foreseeable state, tribal, county, or federal projects.

Mitigation

GG6-19 A comprehensive discussion of proposed mitigation for direct, indirect and cumulative impacts is required by the CEQ Regulations for implementing the Procedural Provisions of NEPA. The CEQ regulations state that an EIS should include the means to mitigate adverse environmental effects (40 CFR 1508.7). As mentioned previously, the CGF proposal is no longer considering groundwater withdrawal as an option to mitigate water quality impacts. Therefore, the final EIS needs to clearly demonstrate how water quality impacts would be mitigated.

GG6-20 Judicial reviews of NEPA cases have supported not only the need for identifying mitigation measures, but for discussing mitigation effectiveness as well. Specifically, for the two proposed projects in the Chehalis watershed, the final EIS must describe and evaluate the effectiveness of the proposed mitigation measures so that EPA, the state and others can be confident that the proposed action will not further contribute to degradation of water quality and aquatic habitat conditions.

Monitoring

The final EIS should include a discussion of monitoring for each resource category determined to be significant including fisheries, wetlands and water quality. A properly designed monitoring plan will demonstrate how well the preferred alternative resolves the identified issues and concerns by measuring the effectiveness of the mitigation measures in controlling or minimizing adverse effects.

GG6-21 The monitoring plan should include types of surveys, location and frequency of sampling, parameters to be monitored, indicator species, budget, procedures for using data or results in project implementation, and availability of results to interested and affected groups.

The EIS should describe the feedback mechanism which can compare baseline data with monitoring results to adjust standard operating procedures, monitoring intensity, and protocol at first detection of adverse effects. Provision of such an adjustment process ensures mitigation strategies will improve in the future and that unforeseen adverse effects are identified and minimized.

GG6-18 Refer to RCP—Washington FEIS for response.

GG6-19 Refer to RCP—Washington FEIS for response.

GG6-20 Refer to RCP—Washington FEIS for response.

GG6-21 The following discussion describes the mitigation measures for wetlands, water quality, vegetation and wildife and other resource areas and monitoring plans HPP has developed and is committed to implement to assure that the design, construction and operation of the HPP project complies with applicable federal, state, and local laws, guidelines, and permitting and reporting requirements.

MITIGATION PLANS

Geology, Slope Stability, and Seismicity

The following measures will be implemented to mitigate any potential for impacts to soils and geology.

1) Facility structures will be founded on dense materials to minimize potential soil consolidation. All facility structures will be designed and constructed to minimize damage resulting from a seismic disturbance. The governing requirements for seismic design will be the state of Oregon Structural Specialty Code.

2) Facility structures will be founded on dense materials to minimize potential of differential settlement.

3) Electrical transmission poles will include setbacks from any cut slope areas and pole placements will avoid any areas of potential liquefaction.

4) The potential for wind erosion will be mitigated by applying water to road surfaces or by implementing other suitable methods for dust control, when required.

5) Silt fences or similar diversion structures will be used as required to limit potential soil erosion due to stormwater. An erosion and sediment control plan has been developed and submitted to DEQ to govern construction activities.

A final geotechnical investigation will be performed prior to the start of construction to confirm subsurface conditions for foundation design, site grading, and liquefaction. The scope of the investigation will be dependent on the subsurface materials encountered. The investigation will include drilling to confirm depth of ground water and soils testing. The results of the investigation will be submitted to the Oregon Department of Energy (ODOE) and the Energy Facility Siting Council (EFSC) for review and comment.

Water Quality

The cogeneration wastewater will be mixed with the effluent from the J.R. Simplot

Attachment to Comment GG6-16

Mitigation Plan Requirements

Mitigation plans required pursuant to Section 404 shall be prepared by a qualified wetlands professional and shall contain, at a minimum, the following elements:

I. Project Description
- (1) Location of Project
- (2) Brief Summary
- (3) Responsible Parties
- (4) Map Indicating Jurisdictional Area and Area of Proposed Fill
- (5) Habitat Type(s) and System Functions to be Impacted
  - (a) Cowardin Classification
  - (b) Soil Characteristics (e.g., Soil Survey Classification and Series, Organic Content, Structure, Texture, Permeability)
  - (c) Functional Assessment
  - (d) Relationship to Aquatic and Upland Resources within the Watershed
  - (e) Relevant Hydrologic Factors (e.g. Water Depths, Velocity, Hydroperiod)

II. Mitigation Goals and Objectives
- (1) Habitat Type(s) and System Functions to be Created, Restored, or Enhanced
- (2) Relevant Hydrologic Factors (e.g. Water Depths, Velocity, Hydroperiod)
- (3) Temporal Impact/Loss
- (4) Replacement Ratio

III. Success Criteria/Performance Standards
- (1) Target Wildlife/Vegetation Characteristics
  - (a) Wildlife/Vegetation Target Species
  - (b) Wildlife Habitat Attributes
  - (c) Percent Vegetation Cover
  - (d) Species Diversity and Richness
  - (e) Structure/Canopy Stratification
  - (f) Above/Below Ground Biomass
- (2) Target Hydrologic Regime
  - (a) Source(s) of water
  - (b) Discharge Points
  - (c) Water Depths
  - (d) Water Velocity
  - (e) Hydroperiod
  - (f) Area to be Affected
  - (g) Direction(s) of Flow
  - (h) Size of Watershed

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 will be required.

Native Vegetation and Soil Types

Native Vegetation

Native vegetation in the Project area is very limited. Most plant communities are highly degraded having been invaded by non-native species and seeds. Project construction activities will be limited to narrow corridor widths of temporary ground disturbance from pipeline construction and temporary access roads. These disturbed sites will be revegetated upon construction completion. A revegetation plan using native plant species has been developed and will be implemented where appropriate. Permanent impacts to vegetation are almost entirely to cropland (the 17 acre energy facility site) where no native vegetation is present. An additional 0.2 to 0.3 acres of vegetation will be permanently impacted from the installation of transmission poles and above ground appurtenances for the operation of the natural gas pipeline(s). Opportunities to place the transmission poles and natural gas pipeline appurtenances in areas already highly disturbed will be maximized during Project layout and design.

Revegetation Plan

The revegetation plan for revegetating disturbed areas created by the construction of the HPP involves two seed mixes and planting procedures as well as a monitoring plan to measure the success of the revegetation efforts.

The seed mixes and planting procedures were developed in consultation with experts from both the public and private sectors. Local wildlife biologists from Oregon Department of Fish and Wildlife (ODFW), and range conservationists from Umatilla County Soil and Water Conservation District (SWCD) and Soil Conservation Service (SCS) were contacted to discuss technical recommendations related to the revegetation effort. Representatives from regional seed companies and revegetation consultants experienced with vegetation restoration projects in the Columbia basin were also contacted.

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(3) Target Soil Characteristics
  (a) Organic Content
  (b) Texture
  (c) Structure
  (d) Color
  (e) Permeability
(4) Water Quality Standards (e.g., Heavy Metals, Ph, Temperature, Dissolved Oxygen Monitoring)

IV. Proposed Mitigation Site
(1) Location and Size of Mitigation Area
(2) Habitat Type(s) and System Functions
(3) Buffer Area Location and Size
(4) Present and Proposed Use of Adjacent Areas
(5) Potential Site Constraints

V. Proposed Site Plans
(1) Plan View Drawing (0.5' Contours with Specific Spot Elevations)
(2) Grading
(3) Hydrologic Alterations
(4) Existing Seasonal High and Low Surface Water Levels and Groundwater Levels
(5) Structure Location and Elevation (e.g. Water Control, Large Organic Debris)
(6) Soil Amendments
(7) Erosion Control
(8) Bank Stabilization
(9) Plantings (e.g., Species List, Source, Density, Plant Material Type, Size)
(10) Irrigation Schedule
(11) Upland Buffer Locations
(12) Existing and Proposed Adjacent and Watershed Land Uses
(13) Special Maintenance or Protective Features (e.g., Fences, Signs, Conservation Easement Boundaries)
(14) Transect and Monitoring Locations

VI. Implementation Schedule

VII. Time Zero Report
(1) As-Built Survey
(2) Photographic Documentation
(3) Alterations/Modifications to Original Site Plan
(4) Landscape Contractor Responsibilities (e.g. Fertilization, Irrigation, Plant Replacement)
(5) Inspection of Completed Mitigation Site

VIII. Maintenance and Contingency Plans

Where Project construction activities cause significant disturbance, these sites will be revegetated. This includes any areas where vegetation has been removed, plant root systems destroyed, or soil has been disturbed to the extent that wildlife habitat is degraded, the potential for noxious weed invasion is increased, or the potential for soil erosion is increased.

The revegetation plan includes seed mixtures developed with three primary purposes in mind:

- To provide year-round habitat for wildlife (especially grassland nesting bird species)
- To prevent noxious weed establishment in disturbed areas
- To prevent excessive soil erosion in disturbed areas.

For the upland areas, two seed mixes will be considered. One employs all native species, while the other uses a combination of native and non-native varieties. Either mix can be used throughout the upland areas depending on administrative priorities and landowner preferences.

Although a seed drill method of planting would be expected to produce higher germination rates, factors such as topography, soil composition and the small size of many of the revegetation units make this method impractical. The two step hydroseeding method, presented below, is proposed as being well suited to the adverse conditions found within the impact area.

Hydroseeding Method

1) Obtain the seed from a reputable source to avoid contamination.
2) Broadcast the seed mixture at the given rate during September or October.
3) Apply wood cellulose fiber mulch (mixed with a tackifier) at a rate of 1 ton per acre immediately after broadcasting the seed (it is important that the seed and mulch be applied in separate processes).

As an alternative, a straw mulch method may be used. This method would be expected to produce lower rates of germination and establishment than the hydroseeding method.

Straw Mulch Method

1) Obtain the seed from a reputable source to avoid contamination.
2) Broadcast the seed mixture at the given rate during September or October.
3) Apply locally obtained, weed free straw at a rate of 2 tons per acre immediately after broadcasting the seed.
4) Compact the area using a roller (either tractor mounted or hand operated).

(1) Responsible Parties
(2) Funding Mechanism
(3) Initiating Procedures

IX. Monitoring Plan
(1) Performance Criteria (Refer to Section III)
(2) Monitoring Methods
(3) Annual Reports (Minimum 5 Years)
(4) Schedule
(5) Responsible Parties

RESTORATION EVALUATION PLAN

1. The project will contribute to increased ecosystem functioning within the watershed.

2. The restoration project, once completed, will be self-sustaining, requiring minimum maintenance and other human intervention.

3. The project will support a broad range of functions.

4. The project will contribute to the restoration of historic ecosystem composition and biodiversity.

5. Anticipated watershed land use will not negatively affect system functioning.

Soils

Precautions will be taken to minimize erosion soil during construction due to winds. Mitigation for wind erosion will include watering of site and access roads. During construction of pipelines the disturbed topsoils and subsoils will be segregated during excavation to minimize soil fertility impacts.

Wetlands

HPP will impelment the following measures as mitigation of potential impacts at the wetlands.

All Wetlands Near Construction Activities

Wetland boundaries adjacent to the construction area will be flagged prior to construction activities

Revegetation will be performed with plant species approved by the ODFW.

Construction disturbance will be restricted to the smallest area practicable.

Berms, silt fences, or straw bales will be used in accordance with the Erosion and Sediment Control Plan to prevent inadvertent fills by uncontrolled stormwater runoff.

Wetland #4

Topsoil will be segregated and stockpiled to be reused in revegetation.

A clay collar will be placed on the down gradient end of the pipeline at the wetland boundary.

A silt fence will be erected immediately outside the toe of the fill to prevent inadvertent fill beyond the structural fill.

At the location of the outfall, fill material will be minimized and stabilized to prevent erosion.

Fill contours will be graded to drain away from the wetland excerpt at the south slope.

The pipeline shall be backfilled and stockpiled topsoil shall be replaced at grade in the trench.

Wetland #13

The ditch crossing will be culverted with adequate pipe to maintain year round flow.

Wetland #15

Construction access for pole placement shall be restricted to times when the areas are not inundated, and when soil is dry enough to support construction equipment without undue displacement (July through October).

All waste and construction debris will be removed from the wetland area and disposed of on uplands.

Native topsoil shall be stockpiled and replaced in the construction area at the completion of pole placement.

Construction disturbance shall be restricted to the smallest area practicable.

Fish and Wildlife Species and Habitat

Because the energy facility is located near a potato processing plant, railroad switchyard, and freeways and other high traffic roads, wildlife use of this area is generally low. Wildlife at the Project facility site area have either habituated to the disturbances or avoid these areas altogether. Wildlife and habitat are not significantly impacted so mitigation is not required at the cogeneration facility.

Mitigation measures will be employed to reduce or eliminate temporary vegetation and wildlife impacts which may result from the construction of supporting facilities. Revegetation of the pipelines and electrical transmission line rights-of-way, where applicable, with seed selected to restore and enhance habitat will replace and possibly increase the available habitat. During pipeline excavation, the topsoil and subsoils will be segregated and the topsoil restored to minimize impacts to soil fertility. This will aid in the restoration of the seeded areas.

Construction of new natural gas pipeline and electrical transmission line shall be scheduled to occur outside of sensitive time periods (Mid-April to August 1) for the following sensitive wildlife species which were documented within the impact area of the proposed natural gas pipeline and electrical transmission line; painted turtle, long-billed curlew, grasshopper sparrow, Swainson's hawk, Burrowing Owl, & bank swallow.

If construction activities cannot be scheduled to occur outside the sensitive time periods for the above listed species, pre-construction biological surveys shall be conducted within the impact area of the proposed natural gas pipeline and electrical transmission line to identify the location of sensitive wildlife.

Mitigation for impacts to sensitive wildlife species found during pre-construction surveys shall be developed after consultation with the Oregon Department of Fish and Wildlife.

Construction and operation of the Project will not alter fish habitat or impact any fish species since no ground disturbing activities will occur in fish habitat, no water withdrawals from the Umatilla River will occur, and the facility will not discharge into the river. The proposed transmission line crosses the Umatilla River in several locations. In these areas, the river and associated riparian habitat will be spanned to avoid impacts. The Project construction and operation will not interfere with anadramous fish migration or fish restoration efforts. No adverse impacts will occur to fish habitat or fish species present in the Umatilla River or in other aquatic habitats in the Project area.

Threatened and Endangered Species

Wintering bald eagles were documented in the Project area during the winter of 1993 - 1994. Solitary day and night roosting occurred along the Umatilla River upstream of the proposed energy facility site. Potential suitable foraging habitat is present within a one mile radius of the facility site. Noise assessment modeling indicates no impacts to bald eagles will occur due to the expected noise levels of normal facility operation. Bald eagle roost trees and food stocks will not be impacted by the construction and operation of the Project.

Raptor protection will be employed in the design and construction of the transmission towers following the methods described by Olendorff et.al., 1981. A detailed design will be submitted to the Oregon Department of Fish and wildlife for review during the design phase of the project. All energized transmission conductors will be designed with adequate separation of a minimum of five feet.

Upon completion of construction of the energy facility, two raptor perching poles shall be placed along the outside edge of the 17 acre energy facility site. The location and design of these raptor perching poles shall be developed after consultation with the Oregon Department of Fish and Wildlife. Raptor perching poles shall be located to benefit raptors, and will not interfere with plant operation and maintenance.

Visual Quality and Aesthetics

Only the upper portions of the stack, the cooling tower plume and portions of the electrical transmission line will be visible from areas identified as having scenic value. Topographic screening of these project features is not practical because their height and the flat terrain of the area. However, paints will be used to minimize the potential for glare on the stacks and the electrical transmission poles. Lighting at the Project will be limited to that necessary to maintain safety and security conditions. Where possible low-maintenance indigenous landscaping will be utilized to screen and buffer the energy facility area.

Historical, Cultural and Archaeological Resources

HPP has consulted with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) regarding historic, cultural and archaeological resources in the area of the facility. HPP will have a CTUIR representative, knowledgeable in cultural resources of the area, available for on-site monitoring during selected portions of the construction. If historic, cultural, or archaeological resources are found during Project excavation work in the affected area will be temporarily stopped until an appropriate representative of the CTUIR or other archaeologist has evaluated the significance of the find. The SHPO will also be consulted to assist in developing procedures to avoid impact to such resources. Should a significant find occur, CTUIR or SHPO will be consulted to define appropriate action.

Socioeconomics

To minimize the potential for impacts on the supply of temporary housing during project construction, HPP will coordinate with local businesses and individuals to provide adequate facilities in advance of the arriving workers.

MONITORING PLANS

Air Quality

HPP has submitted an application for an Air Contaminant Discharge Permit for the cogeneration project to Oregon DEQ. DEQ will require air quality monitoring as part of conditions of permit approval. Specific monitoring requirements will be finalized after DEQ has completed its review and evaluation, and the permit is issued.

Water Quality

The J.R. Simplot Company submitted an application for amendment to its existing Water Pollution Control Facilities (WPCF) permit to the Oregon Department of Environmental Quality on November 18, 1994. This amendment will allow incorporation of the cogeneration wastewater into the Simplot effluent and be land application. As part of the amendment application, HPP and the J.R. Simplot Company proposed a monitoring program to evaluate the performance of the land application system. Monitoring will include: volume and quantity of wastewater discharged; quality of wastewater; and soil and groundwater quality for the acreage irrigated with wastewater. ODEQ approved the amendment of J.R. Simplot's WPCF permit to allow land application of wastewater from HPP's co-generation facility on November 30, 1994.

Vegetation

Vegetated areas disturbed during the Project construction activities will be restored with an appropriate seed mixture for the site. These areas are currently in grasslands or shrub/grass vegetation. A Revegetation Plan has been developed to restore the vegetation which will result in the restoration of disturbed wildlife habitat. Details of the Revegetation Plan are presented under Mitigation.

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

1) In July or August of the year following the initial fall seeding, a qualified surveyor will visit a representative cross-section of reseeded sites. Care will 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 shall record on a separate data sheet, qualitative and quantitative estimates for 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 will also be collected.

3) The location of each survey site will be noted in sufficient detail to allow the site to be relocated at a later date.

4) Each site will be re-surveyed for two additional summers following the initial survey.

5) Following each year's survey, the results will be evaluated based on expected establishment rates for the area. If the success of the plantings falls significantly below desired levels, additional seedings may be necessary.

This monitoring plan is designed to provide general, qualitative information regarding the success of the revegetation effort.

Wildlife

The Swainson's hawk nest south of the proposed energy facility site shall be monitored during the two weeks prior to facility construction to determine if the nest is active. If the nest is determined to be active, a qualified biologist shall be retained to monitor the nest during the facility construction and maintain contact with the Oregon Department of Fish and Wildlife. If monitoring indicates that facility construction is adversely impacting nesting, Swainson's hawks or their young, a mitigation plan shall be developed after consultation with the Oregon Department of Fish and Wildlife.

Measures taken to mitigate impacts to wildlife and their habitats shall be monitored by HPP. Monitoring schedules and methodologies shall be developed after consultation with the Oregon Department of Fish and Wildlife. If these mitigation measures are unsuccessful, corrective action shall be taken by HPP after consultation with the Oregon Department of Fish and Wildlife.

Notification shall be provided to Kevin Blakely at the Pendleton District office of the Oregon Department of Fish and Wildlife at least on week prior to the start of construction for the power plant, transmission line, and natural gas pipeline.

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.

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BIOLOGICAL ASSESSMENT FOR THE HERMISTON POWER PROJECT

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ACRONYMS

BPA	Bonneville Power Administration
cfs	Cubic feet per second
cm	Centimeter
cms	Cubic meters per second
dB(A)	Decibels using the A-weighted scale
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
gpm	Gallons per minute
ha	Hectare
HRSG	Heat recovery steam generator
km	Kilometer
kV	Kilovolt
lpm	Liters per minute
m	Meter
NWP	Northwest Pipeline Corporation
NWR	National Wildlife Refuge
PGT	Pacific Gas Transmission
RCP	Resource Contingency Program
ROW	Right-of-way
SR	State Route
UECA	Umatilla Electric Cooperative Association
USFWS	U.S. Fish and Wildlife Service

1.0 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, BPA initiated the Resource Contingency Program (RCP) that allows BPA to purchase options to acquire power in the future on an "as needed" basis. As part of this program, BPA has purchased options from three independent projects for power generation: the Chehalis Generation Facility in Chehalis, Washington; the Hermiston Power Project in Hermiston, Oregon, and the Satsop Combustion Turbine Project in Satsop, Washington. This Biological Assessment examines the potential effects of constructing this project to Federally listed and proposed wildlife species in the vicinity of the proposed Hermiston Power Project as mandated by Section 7 of the Endangered Species Act (ESA) of 1973. Separate Biological Assessments have been prepared for the other two RCP power generation projects.

In compliance with the ESA, the objective of this Biological Assessment is to: (1) describe the proposed action; (2) provide site-specific information on the Federally listed species potentially occurring in the vicinity of the project; (3) evaluate the potential effects of the proposed project on these species; (4) describe any conservation measures necessary to reduce or eliminate adverse effects; and (5) provide a determination of effect (beneficial, no effect, not likely to adversely affect, or likely to adversely affect) for the listed and proposed species. Information on Federal candidate species potentially occurring in the vicinity of the Hermiston Power Project is provided in the RCP Environmental Impact Statement (EIS).

2.0 PROJECT DESCRIPTION

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 in Township 4 North, Range 28 East, Section 28 (Figure 1). The property is currently owned by the J.R. Simplot Company and the Hermiston Power Partnership. In addition to producing electricity from natural gas combustion and steam generation, the facility would provide steam from waste heat to the J.R. Simplot potato plant for processing operations.

2.1 PROJECT COMPONENTS

Project components associated with the Hermiston Power Project include the cogeneration facility, fuel supply, electrical interconnection and substation modifications, and water supply and wastewater systems. Proposed locations and specifications of project components are highlighted in the following sections.

2.1.1 Cogeneration Facility

The proposed location for the cogeneration facility is a 6.9-hectare (ha) (17-acre) agricultural site located immediately adjacent to the J.R. Simplot potato plant. Most of the surrounding land is also agricultural. The facility would consist of two identical side-by-side combustion turbine generators, two heat recovery steam generators (HRSGs), two steam turbines, two steam surface condensers, and related ancillary facilities. Equipment common to both units would include natural gas supply lines, electrical transmission lines, water supply and wastewater discharge lines, electric room, and control center.

The majority of the facility's equipment, including the turbine generators, would be located in a steel building covering approximately 5,575 square meters (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 53.3-m (175-foot) high exhaust stacks, cooling towers, HRSGs, electrical substation, and storage tanks for water, back-up fuel oil, and chemicals.

2.1.2 Fuel Supply

The cogeneration facility's primary fuel would be natural gas. Current plans are to have two supply sources: (1) an approximately 13-km (8-mile) long, 30-centimeter (cm) (12-inch) Northwest Pipeline Corporation (NWP) lateral pipeline; and (2) a 6.4-km (4-miles), 30-cm (12-inch) Pacific Gas Transmission (PGT) Company's lateral pipeline (Figure 1).

2.1.3 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 generated at the cogeneration facility to the McNary Substation: the Western 230-kilovolt (kV) Alternative and Eastern 500-kV Alternative (Figure 1). These alternative routes, together with the modifications required at the McNary Substation to accommodate the new power source, are described below.

Western 230-kV Alternative (Preferred Alternative)

This 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-Weston potato plant north to the City of Umatilla, then east and north to the McNary Substation (Figure 1). 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 at the Lamb-Weston potato plant site 3.2 km (2 miles) west of the Hermiston Power Project. This upgrading will take place prior to, and is independent of, the Hermiston Power Project being developed.

The UECA 115-kV line would be relocated to a new wood pole transmission line (UECA 115-kV relocation) to be constructed along county ROW. The required 230-kV conductor and insulators

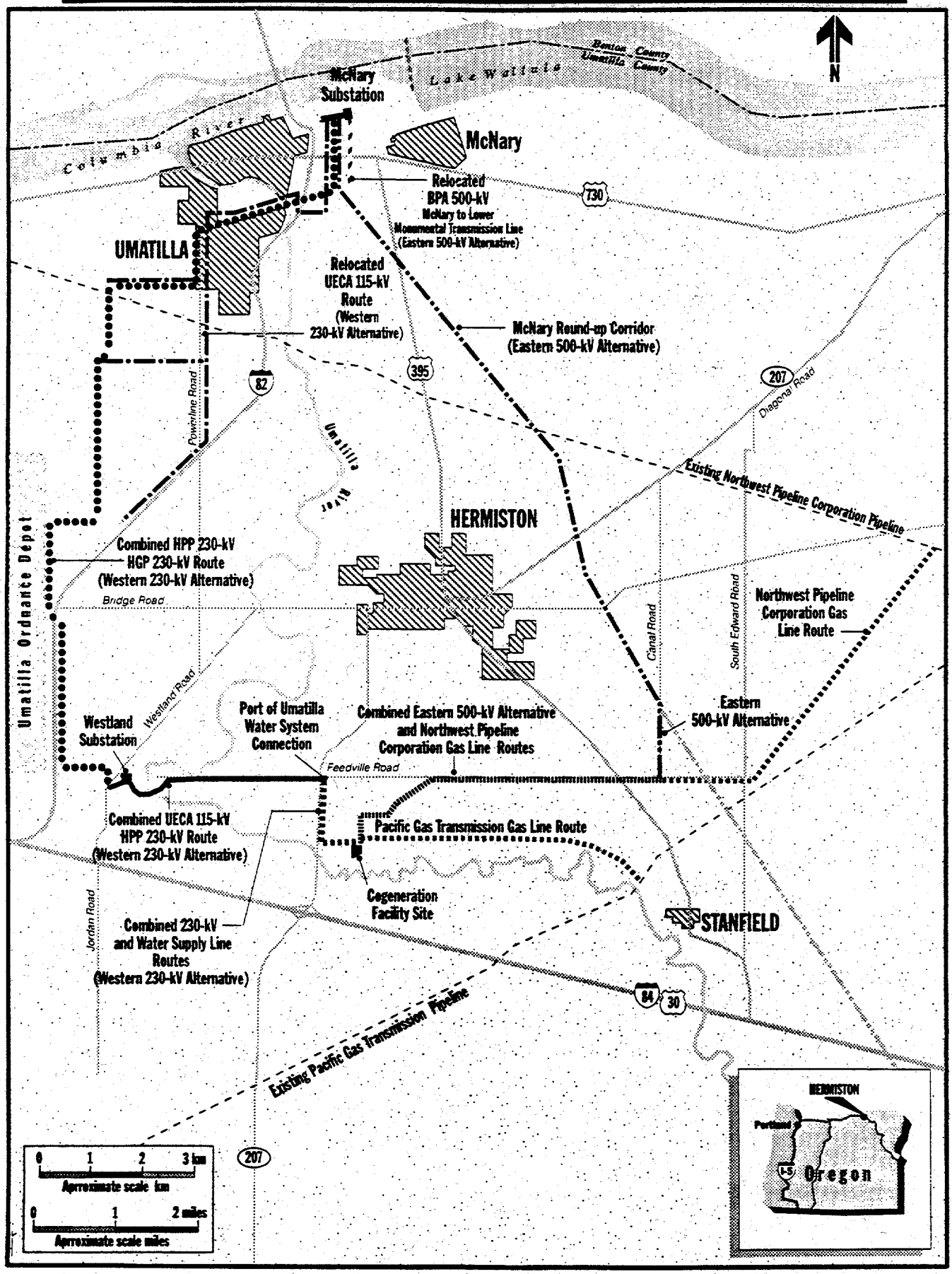

Figure 1 Project Vicinity Map

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 project would be connected to the UECA line at the Westland Substation by constructing approximately 2.4 km (1.5 miles) of new 230-kV line from the cogeneration facility site west and then north to Feedville Road, then continuing approximately 3.2 km (2 miles) west along Feedville Road to the Westland Substation at the Lamb-Weston Plant. This portion of the proposed 230-kV line along Feedville Road across the Umatilla River would be constructed on the same poles supporting an existing UECA 115-kV line from Westland Substation to the Feedville Substation (Figure 1).

Eastern 500-kV Alternative

This alternative would require a new 500-kV single-circuit line to be 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 (Figure 1). The new 500-kV line would be constructed on single-shaft steel poles or towers on the eastern side of the existing 230-kV McNary-Roundup Line No. 1. It is anticipated that pole/tower spacing would range between 304.8 and 365.8 m (1,000 to 1,200 feet) within the existing corridor.

From the McNary Substation south for a distance of approximately 1.4 km (0.9 mile), the Hermiston Power Project 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 Hermiston Power Project 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), at which point the line reaches the BPA 230-kV McNary Round-Up 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) long, would be located about 200 m (656 feet) west of its present location.

The connection from the cogeneration facility to the McNary-Roundup Corridor (approximately 8.7 km [5.4 miles]) would be accomplished by constructing a new 500-kV line on steel poles or towers along the proposed NWP gas line route, most of which is along the south side of Feedville Road (Figure 1). Pole spacing is anticipated to range between 152 to 244 m (500 to 800 feet) along the new corridor.

2.1.4 Water Supply and Wastewater Systems

Process water and boiler make-up water would be obtained from the Port of Umatilla system. The water supply for the project would originate at the Port of Umatilla treatment facility north of Feedville Road and be transported to the cogeneration facility site by a 1.9-km (1.2-mile) pipeline (Figure 1). Potable water would be obtained from the J.R. Simplot Potato Processing Plant adjacent to the proposed cogeneration facility site.

Water for the cogeneration facility would be purchased from the Port of Umatilla regional water system, which would draw water from the Columbia River under an existing water right. The

Port's planned facilities would be constructed independently of the proposed Hermiston Power Project. The proposed cogeneration facility water supply pipeline would originate at the Port's proposed water treatment plant, which is located about 2.1 km (1.3 miles) north on State Route (SR) 207. The pipeline would parallel SR 207 to the cogeneration facility site (Figure 1).

The cogeneration facility's 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 sewer system.

2.2 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. The length of construction of the electrical transmission lines would depend on selected alternative; construction of either route would not exceed 12 months.

3.0 SITE SPECIFIC INFORMATION ON FEDERALLY LISTED SPECIES

The bald eagle (*Haliaeetus leucocephalus*), a Federally threatened species in Oregon, has been identified by the U.S. Fish and Wildlife Service (USFWS) as potentially occurring in the vicinity of the Hermiston Power Project (letter from R. Peterson, Field Supervisor, USFWS, Portland, Oregon, April 12, 1994). This section provides information on the occurrence of the bald eagle in the project vicinity and habitat availability as determined through surveys, consultation with local biologists, and literature reviews. Information on the species' natural history can be obtained from Stalmaster (1987), USFWS (1986), and other scientific literature.

Surveys were conducted between November 13, 1993 and April 10, 1994 to determine the use of habitats by bald eagles within an approximately 1.6-km (1-mile) radius of the project components (Northwest Wildlife Surveys [NWS] 1994). Areas within 1.6 km (1 mile) of the project were surveyed weekly, whereas areas between 1.6 and 8 km (1 and 5 miles) away from the project were surveyed bi-weekly. Surveys were conducted by vehicle and foot (plus one drift boat trip of the Umatilla River) during mornings and afternoons. Late afternoon to dusk surveys were conducted in areas with suitable roosting habitat. In addition, several biologists

familiar with the area were consulted to determine the level of bald eagle use in the project vicinity.

Results of the surveys and agency consultation indicated that only wintering bald eagles occur in the project vicinity; no nesting activity is known to occur near the project (NWS 1994). The bald eagle wintering period is generally considered to be October 31 to March 31. Wintering bald eagles in the Pacific Northwest most commonly perch on tall snags, ponderosa pine, and cottonwoods (Stalmaster and Newman 1978, Fielder and Starkey 1986); proximity to a food source is probably the most important factor influencing perch selection (Steenhof et al. 1980).

Bald eagles winter in several locations in the project vicinity, most of which are greater than 1.6 km (1 mile) from any of the proposed project components (Figure 2). The most consistently used bald eagle wintering areas are the Cold Springs National Wildlife Refuge (NWR) located 6.4 km (4 miles) east of the existing 500-kV transmission line and the Umatilla NWR along the Columbia River, just west of Umatilla, Oregon. Both of these areas support a small number (3 to 5) of wintering eagles each winter. In addition to the NWRs, a day and night winter roost consistently used by a single immature eagle was identified approximately 5.6 km (3.5 miles) east of the McNary Substation, along the south shore of the Columbia River (NWS 1994). Other observations indicated regular but very localized, use by individual wintering bald eagles of riparian, wetland, and agricultural habitats within the proximity of the proposed project facilities. Most of the observations consisted of individual eagles foraging over agricultural areas and ponds or perching/roosting in riparian habitats along the Umatilla River, from just upriver from the cogeneration facility to beyond the eastern end of the PGT natural gas pipeline (Figure 2).

High quality bald eagle perching/roosting habitat occurs 5.6 km (3.5 miles) up the Umatilla River from the proposed cogeneration facility site. This area is approximately 402 meters (0.25 mile) from the eastern end of the proposed PGT natural gas pipeline (Figure 2). Forest stand structure (i.e., uneven-aged with at least a remnant of the old-growth component) is an important habitat component for selection of communal night roosts (Anthony et al. 1982). The upper reaches of the Umatilla River are bordered by cottonwood, willow, alder, and Russian olive trees, and other riparian vegetation that eagles can use for perching and roosting while foraging on waterfowl. Low and moderate quality riparian habitat, representing potentially suitable perching and limited roosting habitat, extends throughout the river reach from 0.8 km (0.5 mile) southeast of the cogeneration facility site upriver 402 m (0.25 mile) to just south of the eastern end of the PGT natural gas pipeline (Figure 2). Individual wintering bald eagles have been observed along the entire reach from south of the Hermiston Power Project facility to beyond the PGT route, as well as in agricultural fields to the south of the river. One eagle consistently used the higher quality habitat all winter long. No bald eagle use has been documented along the Umatilla River downriver from the proposed power generation facility.

Bald eagles require large expanses of open water or land for foraging and feeding (Stalmaster 1987). Wintering eagles in the vicinity of the project forage on waterfowl on the Umatilla and Columbia rivers and small wetlands and ponds from mid-December to early-February. They also feed on fish, including coho and chinook salmon and steelhead trout; domestic and wild animal carcasses; and livestock placentas. Potential foraging habitat exists at the Power City

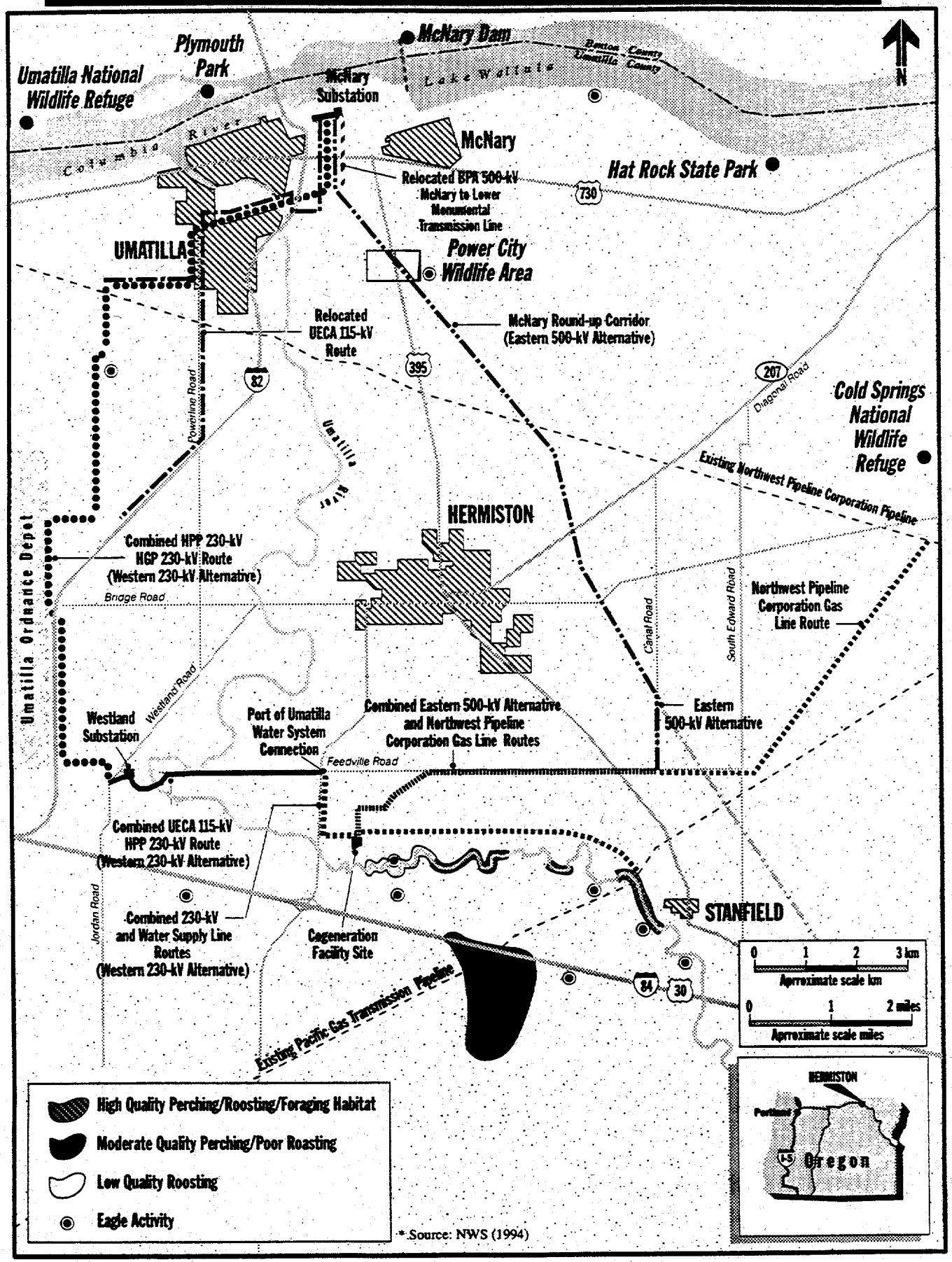

Figure 2 Locations of Bald Eagle Activity and Suitability of Project Vicinity Habitat for Perching, Roosting, and Foraging

Wildlife Area wetlands along the Eastern 500-kV Alternative transmission line. One bald eagle was observed flying over the Power City Wildlife Area during the 1993-94 winter period. Foraging use by bald eagles, however, appears to be very low because the wetlands freeze, limiting waterfowl use during the winter. Foraging activity was also documented on one occasion when an eagle was observed circling over livestock calves in agricultural fields near the Western 230-kV Alternative transmission line route, northeast of the Umatilla Ordnance Depot (NWS 1994). Other foraging activity was documented in agricultural fields and ponds south of the Umatilla River and Interstate 84.

4.0 EFFECTS OF THE PROJECT ON FEDERALLY LISTED SPECIES

Potential effects to bald eagles include: (1) direct loss of roosting or perching habitat, (2) effects to food supplies, (3) disturbance to wintering bald eagles, and (4) collision and electrocution from electrical transmission lines.

4.1 Loss of Habitat

The project will not affect any perching or roosting habitat in the project vicinity; most of the land traversed by the pipeline and transmission line routes is agricultural or shrub-steppe. The Western 230-kV Alternative crosses the Umatilla River; however, it is not likely to impact any of the riparian habitat as the poles would be placed outside of this zone. Additionally, bald eagle use has not been documented in this river reach. The Eastern 500-kV Alternative would cross the Power City Wildlife Area, immediately adjacent to an existing transmission line passing over wetland/riparian habitat. No potential roosting or perching habitat would be removed and this wildlife area is rarely used by bald eagles.

4.2 Effects on Food Supplies

Potential effects from the proposed Hermiston Power Project on food supplies include interference of new transmission lines with waterfowl use of the area; ground disturbance and project operation altering fish, small mammal, and waterfowl habitat; and alteration of fish and waterfowl populations as a result of water withdrawal. Although the alternative for electrical transmission has not been chosen and exact pole locations are unknown, new lines would not interfere with waterfowl flight paths and would not be located within 1.5 km (0.9 mile) of any roost sites. The Eastern 500-kV Alternative route crosses the Power City Wildlife Area, which is used by up to 1,000 ducks during fall migration. This area, however, readily freezes in winter, precluding wintering eagles from foraging in the area.

The water supply source for the proposed Hermiston Power Project is the Columbia River, which has an average discharge of approximately 4,808 cubic meters per second (cms) (169,800 cubic feet per second [cfs]) (288,490,384 liters per minute [lpm] [76,211,334 gallons per minute {gpm}]) at McNary Dam approximately 14.5 km (9 miles) north of the site. It is estimated that withdrawal of approximately 0.12 cms (4.2 cfs) (7,135.9 lpm [1,885.1 gpm]) would be required to support the cogeneration facility. The amount of water necessary for project operation is nominal with respect to the Columbia River discharge; therefore, the potential effect that water withdrawal would have on fish or waterfowl would be low.

4.3 DISTURBANCE

Ground disturbing activities, primarily construction of the natural gas pipelines and electrical transmission lines, would be confined to narrow construction corridors. Nevertheless, such activities would temporarily displace wildlife, including potential prey species of bald eagles, from the immediate area. Construction would be scheduled beginning in mid- to late spring and continue through the fall, thus eliminating potential effects to wintering bald eagle prey availability. All temporarily disturbed land that potentially supports prey species would be revegetated. The permanent habitat loss would be approximately 7 ha (17 acres), depending on which transmission line alternative is selected, and the majority of the lands are agricultural.

A noise assessment conducted by the project developer indicated that increases in noise levels caused by construction and operation of the Hermiston Power Project would not exceed 10 decibels (using the A-weighted scale; dB[A]) over existing noise levels within a 0.8-km (1-mile) radius of the proposed facility, indicating that project construction and operation would not likely affect bald eagles. Temporary disturbance to bald eagles and their prey could result from noise emitted during construction activities of the electrical transmission and natural gas pipeline right-of-ways (ROWs) and the cogeneration facility if construction occurs during the October 31 to March 31 bald eagle wintering period. The greatest potential for construction/noise disturbance would occur near the PGT gas pipeline route near the Umatilla River and the Eastern 500-kV Alternative near Power City Wildlife Area, both areas with documented bald eagle wintering use.

4.4 ELECTRICAL TRANSMISSION LINE HAZARDS

Raptors, including bald eagles, are generally not susceptible to collision with transmission lines, most likely because of their keen eyesight, nonflocking behavior, and flight maneuverability (Williams and Colson 1988). As planned, all new transmission lines would incorporate the guidelines presented by Olendorff et al. (1981), and would be separated by at least 4.3 m (14 feet) vertically and 3 m (10 feet) horizontally, a distance that would preclude electrocution of bald eagles.

The cumulative effects of the project are expected to minimal, as the proposed project would only marginally increase the rate of residential and industrial development in the region.

5.0 MITIGATION MEASURES

Potential effects of the proposed Hermiston Power Project on bald eagles occurring in the vicinity could be minimized by:

- Avoiding construction in wetland and riparian habitats that provide potential perching, roosting, or foraging habitat;
- Placing project facilities at least 1.5 km (0.9 mile) from known communal roost sites;
- Completing construction activities, particularly facilities closest to the Umatilla River and Power City Wildlife Area, outside of the October 31 through March 31 wintering period;
- Revegetating all disturbed habitats with native plant species capable of supporting wildlife species;
- Ensuring that water quality is not affected by construction or wastewater discharge; and
- Adhering to guidelines for design of transmission lines to avoid collision and electrocution of raptors.

6.0 DETERMINATION OF EFFECT

Based on the description of the project and associated mitigation measures, no loss of suitable bald eagle habitat would result from construction or operation of the project and disturbance from the facility would be nominal. Therefore, construction and operation of the Hermiston Power Project is not likely to adversely affect the bald eagle.

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ATTACHMENT A

AGENCY LETTERS

EBASCO

December 14, 1993
EBEL-BPA-93-098

Mr. Josh Millman
U.S. Fish and Wildlife Service
2600 S.E. 98th Ave., Suite 100
Portland, OR 97266

Subject: **Request for Threatened and Endangered Species Data for the Hermiston Power Project**

Dear Mr. Millman:

As part of an Environmental Impact Statement, Ebasco Environmental is preparing an Environmental Report for the Bonneville Power Administration on the Hermiston Power Project. The proposed project is a combined cycle combustion turbine project located in Hermiston. Oregon. We have enclosed a map indicating the general location of the proposed plant and associated transmission lines and gas pipelines. Please send a list of endangered, threatened, and candidate species of plants and animals that may occur in the vicinity of the project area. The legal description of the project area and 5-mile radius is as follows:

T3N, R28E all sections
T4N, R28E all sections
T5N, R28E all sections
T4N, R27E sections 1, 2, 3, 10-15. 22-27, 34, 35, and 36
T5N, R27E sections 13, 24, 25, and 36
T4N, R29E sections 5-8, 19, 20, 21, and 28-33
T3N, R29E sections 5 and 6

All of these sections occur on the following USGS 1:24,000 quadrangles: Stanfield. Hermiston. Umatilla, Ordnance, and Service Buttes.

EBASCO ENVIRONMENTAL *A Division of Ebasco Services Incorporated*
10900 NE 8TH STREET • BELLEVUE. WA 98004-4405 • (206) 451-4600 • FAX (206) 451-4691

If you have any questions regarding this request, please do not hesitate to call me at 206-451-4296.

Thank you.

Sincerely,

EBASCO ENVIRONMENTAL

Gregory A. Green
Principal Wildlife Biologist

Enclosures

cc: D. Broadfoot
(without enclosures)

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Portland Field Office
2600 S.E. 98th Avenue, Suite 100
Portland, Oregon 97266
(503) 231-6179 Fax: (503)-231-6195

January 12, 1994

Ref: 1-7-94-SP-105

Gregory A. Green
Ebasco Environmental
10900 NE 8th Street
Bellevue, Washington 98004-4405

RE: EBEL-BPA-93-098

Dear Mr. Green:

This is in response to your letter, dated December 14, 1993, requesting information on listed and proposed endangered and threatened species that may be present within the area of the proposed Hermiston Power Project in Umatilla County, Oregon. The U.S. Fish and Wildlife Service (Service) received your letter on December 15, 1993.

We have attached a list (Attachment A) of threatened and endangered species that may occur within the area of the Hermiston Power Project. The list fulfills the requirement of the Service under Section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 USC 1531 et seq.). The Bonneville Power Administration's (BPA) requirements under the Act are outlined in Attachment B.

Should the BPA's biological assessment determine that a listed species may be affected by the project, the BPA should consult with the Service following the requirements of Federal Regulation 50 CFR 402 which implement the Act.

Attachment A includes a list of candidate species under review for listing. These candidate species have no protection under the Act but are included for consideration as it is possible candidates could become formal proposals and be listed prior to project completion. Therefore, if the proposed project may affect candidate species, the BPA is not required to perform a biological assessment or to consult with the Service. However, if early evaluation of the project indicates that it is likely to adversely impact a candidate species, the BPA may wish to request technical assistance from this office.

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Your interest in endangered species is appreciated. If you have questions regarding your responsibilities under the Act, please contact Diana Hwang at (503) 231-6179. For questions regarding anadromous fish, please contact National Marine Fisheries Service, 911 NE 11th Ave., Room 620, Portland, Oregon, (503) 230-5420. All correspondence should include the above referenced case number.

Sincerely,

for Russell D. Peterson
Field Supervisor

Attachments

cc: PFO-ES
BFO-SE
ODFW (Nongame)
ONHP

SP105

ONHP/DH/NP

ATTACHMENT A

FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF THE PROPOSED HERMISTON POWER PROJECT
1-7-94-SP-105

LISTED SPECIES[1/]

Birds		
Bald eagle	*Haliaeetus leucocephalus*	LT
Documented occurrence on Cold Springs NWR (wintering area)		
Fish		
Chinook salmon	*Oncorhynchus tshawytscha*	**LT
Spring/summer and fall runs in the Snake River. (petitioned June 7, 1990; proposed June 27, 1991 in 56 FR 29542-29544; listed April 22, 1991 in 57 FR 14653)		
Snake River Sockeye salmon	*Oncorhynchus nerka*	**LE
Salmon River tributary to the Snake River, Idaho. (petitioned April 2, 1990; proposed April 6, 1991 in 56 FR 14055; listed November 20, 1991 in 56 FR 58619)		

PROPOSED SPECIES[1/]

None

CANDIDATE SPECIES[2,3/]

Mammals		
Pygmy rabbit	*Brachylagus idahoensis*	C2
Pacific western big-eared bat	*Plecotus townsendii townsendii*	C2
Birds		
Tricolored blackbird	*Agelaius tricolor*	C2
Documented occurrence at Manns Pond		
Ferruginous hawk	*Buteo regalis*	C2
Loggerhead shrike	*Lanius ludovicianus*	C2
Long-billed curlew	*Numenius americanus*	3C
Documented occurrences at McNary Potholes, Umatilla Meadows, Echo Meadows and Umatilla Ordnance Depot		
Mountain quail	*Oreortyx pictus*	C2
Plants		
Columbia cress	*Rorippa columbiae*	C2
Documented historical occurrence along Columbia River near Umatilla		

(E) - Endangered (T) - Threatened (CH) - Critical Habitat

(S) - Suspected (D) - Documented

(C1)- Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.

(C2)- Category 2: Taxa for which existing information indicates may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

(3A)- Category 3A: Taxa for which the Service has persuasive evidence of extinction.

(3B)- Category 3B: Names that on the basis of current taxonomic understanding do not represent taxa meeting the Act's definition of "species."

(3C)- Category 3C: Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat.

* *If a vertebrate or plant, a single asterisk indicates taxon is possibly extinct. If an invertebrate, a single asterisk indicates a lack of information for the taxon since 1963.*

** *Consultation with National Marine Fisheries Service required.*

1/ *U. S. Department of Interior, Fish and Wildlife Service, July 15, 1991, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12.*

2/ *Federal Register Vol. 56, No. 225, November 21, 1991, Notice of Review-Animals*

3/ *Federal Register Vol. 58, No. 188, September 30, 1993, Notice of Review-Plants*

ATTACHMENT B

FEDERAL AGENCIES RESPONSIBILITIES UNDER SECTIONS 7(a) and (c)
OF THE ENDANGERED SPECIES ACT

SECTION 7(a) - Consultation/Conference

Requires: 1) Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2) Consultation with FWS when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of Critical Habitat. The process is initiated by the Federal agency after they have determined if their action may affect (adversely or beneficially) a listed species; and

3) Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed Critical Habitat.

SECTION 7(c) - Biological Assessment for Major Construction Projects [1/]

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to identify any proposed and/or listed species which are/is likely to be affected by a construc- tion project. The process is initiated by a Federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the species list, the accuracy of the species list should be informally verified with our Service.. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should: (1) conduct an on- site inspection of the area to be affected by the proposal which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or for potential reintroduction of the species; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within FWS, National Marine Fisheries Service, State conservation departments, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevant information. The BA should conclude whether or not a listed or proposed species will be affected. Upon completion, the report should be forwarded to our Portland Office.

[1/] A construction project (or other undertaking having similar physical impacts) which is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332.(2)c). On projects other than construction, it is suggested that a biological evaluation similar to the biological assessment be undertaken to conserve species influenced by the Endangered Species Act.

FOSTER WHEELER ENVIRONMENTAL CORPORATION

May 31, 1995
FWBEL-BPA/RCP-95-018

Ms. Diana Hwang
U.S. Fish and Wildlife Service
Fish and Wildlife Enhancement
2600 S.E. 98th Ave., Suite 100
Portland, OR 97266

SUBJECT: REQUEST FOR UPDATED LIST OF ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES OF WILDLIFE AND PLANTS OCCURRING NEAR THE PROPOSED HERMISTON POWER PROJECT

Dear Ms. Hwang:

Please provide an updated list of endangered, threatened, proposed and candidate species of wildlife and plants and critical habitat that occur or may occur within the vicinity of the proposed Hermiston Power Project. The USFWS last provided a species list to Ebasco Environmental (the former name of Foster Wheeler Environmental Corporation) for this proposed project in a letter dated 12 January 1994.

The legal location of the proposed project encompasses the following Townships (T), Ranges (R), and Sections:

T3N, R28E all Sections
T4N, R28E all Sections
T5N, R28E all Sections
T4N, R27E Sections 1, 2, 3, 10-15, 22-27, 34, 35, 36
T5N, R27E Sections 13, 24, 25, 36
T4N, R29E Sections 5-8, 19, 20, 21, 28-33
T3N, R29E Sections 5, 6

Enclosed is a map depicting the general location of the proposed project.

If you have any questions regarding this request, please call me at (206) 688-3811.

Sincerely,

Mari A. Smultea
Wildlife Biologist

cc: D. Broadfoot (w/out enclosures)
D. Boorse (w/out enclosures)

10900 NE 8TH STREET, SUITE 1300, BELLEVUE, WA 98004-4405
TEL: 206-688-3700 FAX: 206-688-3952

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oregon State Office
2600 S.E. 98th Avenue, Suite 100
Portland, Oregon 97266
(503) 231-6179 FAX: (503) 231-6195

June 27, 1995

In reply refer to:
1-7-95-SP-338

Mari Smultea
Foster Wheeler Environmental Corporation
10900 NE 8th Street, Suite 1300
Bellevue, WA 98004-4405

Dear Ms. Smultea:

This is in response to your letter, dated 31 May 1995, requesting information on listed and proposed endangered and threatened species that may be present within the area of the Hermiston Power Project II in Umatilla County. The U.S. Fish and Wildlife Service (Service) received your letter on 5 June 1995.

We have attached a list (Attachment A) of threatened and endangered species that may occur within the area of the Hermiston Power Project II. The list fulfills the requirement of the Service under section 7© of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Bonneville Power Administration (BPA) requirements under the Act are outlined in Attachment B.

The purpose of the Act is to provide a means whereby threatened and endangered species and their ecosystems on which they depend may be conserved. Under section 7(a)(1) and 7(a)(2) of the Act and pursuant to 50 CFR 402 *et seq.*, BPA is required to utilize their authorities to carry out programs which further species conservation and to determine whether projects may affect threatened and endangered species, and/or critical habitat. A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) which are major Federal actions significantly affecting the quality of the human environment as defined in NEPA (42 U.S.C. 4332 (2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to the Biological Assessment be prepared to determine whether they may affect listed and proposed species. Recommended contents of a Biological Assessment are described in Attachment B, as well as 50 CFR 401.12.

If BPA determines, based on the Biological Assessment or evaluation, that threatened and endangered species and/or critical habitat may be affected by the project, BPA is required to

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consult with the Service following the requirements of 50 CFR 402 which implement the Act.

Attachment A includes a list of candidate species under review for listing. These candidate species have no protection under the Act but are included for consideration as it is possible candidates could be listed prior to project completion. Thus, if a proposed project may affect candidate species, BPA is not required to perform a Biological Assessment or evaluation or consult with the Service. However, the Service recommends addressing potential impacts to candidate species in order to prevent future conflicts. Therefore, if early evaluation of the project indicates that it is likely to adversely impact a candidate species, BPA may wish to request technical assistance from this office.

Your interest in endangered species is appreciated. The Service encourages BPA to investigate opportunities for incorporating conservation of threatened and endangered species into project planning processes as a means of complying with the Act. If you have questions regarding your responsibilities under the Act, please contact Diana Hwang at (503) 231-6179. For questions regarding anadromous fish, please contact National Marine Fisheries Service, 911 N.E. 11th Ave., Room 620, Portland, Oregon (503) 230-5420. All future correspondence should be addressed to the State Supervisor and include the above referenced file number.

Sincerely,

for Russell D. Peterson
State Supervisor

Attachments
SP 338
cc: PFO-ES
ODFW (nongame)
BPA

FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF THE PROPOSED HERMISTON POWER PROJECT II
1-7-95-SP-338

LISTED SPECIES[1/]

Birds		
Bald eagle	*Haliaeetus leucocephalus*	LT
Documented Cold Springs NWR		
Peregrine Falcon	*Falco peregrinus anatum*	LT
Winter migrant along upper Columbia River		
Fish		
Snake River Chinook salmon	*Oncorhynchus tshawytscha*	(CH) **LT
Spring/summer runs in the Snake River (petitioned June 7, 1990; proposed June 27, 1991 in 56 FR 29542-29544; listed April 22, 1992 in 57 FR 14653)		
Snake River Chinook salmon	*Oncorhynchus tshawytscha*	(CH) **LT
Fall runs in the Snake River. (petitioned June 7, 1990; proposed June 27, 1991 in 56 FR 29542-29544; listed April 22, 1992 in 57 FR 14653)		
Snake River Sockeye salmon	*Oncorhynchus nerka*	(CH) **LE
Salmon River tributary to the Snake River, Idaho. (petitioned April 2, 1990; proposed April 6, 1991 in 56 FR 14055; listed November 20, 1991 in 56 FR 58619)		

PROPOSED SPECIES[/]

None

CANDIDATE SPECIES[2,3/]

Mammals		
Long-eared myotis (bat)	*Myotis evotis*	C2
Long-legged myotis (bat)	*Myotis volans*	C2
Yuma myotis (bat)	*Myotis yumanensis*	C2
Pale western big-eared bat	*Plecotus townsendii palescens*	C2
Pacific western big-eared bat	*Plecotus townsendii townsendii*	C2
Washington ground squirrel	*Spermophilus washingtoni*	C2
Documented in project area		

Birds		
Tricolored blackbird	*Agelaius tricolor*	C2
Documented in project area		
Western burrowing owl	*Athene cunicularia hypugea*	C2
Documented in project area		
Ferruginous hawk	*Buteo regalis*	C2
Amphibians and Reptiles		
Northern sagebrush lizard	*Sceloporus graciosus graciosus*	C2
Fish		
Margined sculpin	*Cottus marginatus*	C2
Documented Umatilla River		
Pacific lamprey	*Lampetra tridentata*	C2
Plants		
Hepatic monkeyflower	*Mimulus jungermannioides*	C2
Columbia cress	*Rorippa columbiae*	C2

(LE) - Listed Endangered
(PE) - Proposed Endangered
(S) - Suspected
(LT) - Listed Threatened
(PT) - Proposed Threatened
(D) - Documented
(CH) - Critical Habitat has been designated for this species
(PCH) - Critical Habitat has been proposed for this species

(C1)- Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
(C2)- Category 2: Taxa for which existing information indicates may warrant listing, but for which substantial biological information to support a proposed rule is lacking.
(3A)- Category 3A: Taxa for which the Service has persuasive evidence of extinction.
(3B)- Category 3B: Names that on the basis of current taxonomic understanding do not represent taxa meeting the Act's definition of "species."
(3C)- Category 3C: Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat.
* If a vertebrate or plant, a single asterisk indicates taxon is possibly extinct. If an invertebrate, a single asterisk indicates a lack of information for the taxon since 1963.
** Consultation with National Marine Fisheries Service required.

1/ U. S. Department of Interior, Fish and Wildlife Service, August 23, 1993, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12.
2/ Federal Register Vol. 59, No. 219, November 15, 1994, Notice of Review-Animals
3/ Federal Register Vol. 58, No. 188, September 30, 1993, Notice of Review-Plants

ATTACHMENT B

FEDERAL AGENCIES RESPONSIBILITIES UNDER SECTIONS 7(a) and (c) OF THE ENDANGERED SPECIES ACT

SECTION 7(a) - Consultation/Conference

Requires: 1) Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2) Consultation with FWS when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of Critical Habitat. The process is initiated by the Federal agency after they have determined if their action may affect (adversely or beneficially) a listed species; and

3) Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed Critical Habitat.

SECTION 7(c) - Biological Assessment for Major Construction Projects [1/]

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to identify any proposed and/or listed species which are/is likely to be affected by a construc- tion project. The process is initiated by a Federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the species list, the accuracy of the species list should be informally verified with our Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should: (1) conduct an on- site inspection of the area to be affected by the proposal which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or for potential reintroduction of the species; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within FWS, National Marine Fisheries Service, State conservation departments, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevant information. The BA should conclude whether or not a listed or proposed species will be affected. Upon completion, the report should be forwarded to our Portland Office.

[1/] A construction project (or other undertaking having similar physical impacts) which is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332.(2)c). On projects other than construction, it is suggested that a biological evaluation similar to the biological assessment be undertaken to conserve species influenced by the Endangered Species Act.

Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

March 6, 1995

Mr. David C. Frederick
U.S. Fish and Wildlife Service
3704 Griffin Lane SE, Suite 102
Olympia, WA 98501

Dear Mr. Frederick:

Under the Resource Contingency Program (RCP), Bonneville Power Administration (BPA) has entered into contract with Hermiston Power Partners to acquire an option to purchase electrical power from the proposed Hermiston Power Project (HPP). This option to purchase power from the proposed gas-fired combustion turbine cogeneration facility would be exercised within the next 5 to 10 years only if BPA cannot meet electricity requirements in the Northwest through existing sources or conservation programs.

The proposed HPP is a 430 average Megawatt natural gas-fired combined-cycle combustion turbine cogeneration plant located in an industrial area approximately 4.8 kilometers (3 miles) south of the City of Hermiston in Umatilla County, OR. A description of the proposed project can be found in the enclosed Biological Assessment (BA).

In response to your letter dated January 12, 1994, you stated that the bald eagle (Haliaeetus leucocephalus), the chinook salmon (Oncorhynchus tshawytscha), and the snake river sockeye salmon (Oncorhynchus nerka) may be present in the area of the proposed project. BPA has prepared the enclosed BA which concludes that the proposed project is not likely to adversely affect the bald eagle.

With regard to chinook salmon and snake river sockeye salmon, the only potential impact from the proposed project would be the withdrawal of 0.12 cms (4.2 cfs) of water from the Columbia River required for the project. This withdrawal represents only 0.004 percent of the average low flow in the Columbia River in that area. Therefore, this is considered to constitute a negligible impact on the salmon and steelhead resources in the project area, and a BA was not undertaken on these listed species. Additional information on these listed fish species can be found in Sections 2.6, and 3.6, of the Resource Contingency Program Draft Environmental Impact Statement (EIS), February 1995, conveyed to your department under separate cover.

We are requesting your review of the BA and concurrence with these findings within 30 days of your receipt of this letter and BA. Please contact me at (503) 230-5678, if you have any questions or require additional information.

Sincerely,

Dawn R Boorse

Dawn R. Boorse
Environmental Project Manager

Enclosure

FOSTER WHEELER ENVIRONMENTAL CORPORATION

August 7, 1995
FWBEL-BPA-95L-045

Russell Peterson
Field Supervisor
U.S. Fish and Wildlife Service
2600 SE 98th Ave.
Portland, OR 97266

Subject: **Follow-up Request for Concurrence - Biological Assessment for the Hermiston Power Project, Hermiston, Oregon**

Dear Mr. Peterson:

This letter is being sent on behalf of Dawn Boorse, EIS Project Manager for the Resource Contingency Program of the Bonneville Power Administration (BPA). On 6 March 1995 BPA sent to the USFWS office in Olympia, Washington, a copy of the Biological Assessment we prepared for the Hermiston Power Project, together with a letter (copy enclosed) requesting USFWS's concurrence with the determination of effect.

I spoke with Chandra Madrona of the USFWS in Olympia and with Diana Hwang of the USFWS in Portland, but neither office has any record of receiving the enclosed request letter and Biological Assessment. We have therefore enclosed a copy of the Biological Assessment.

Also, we requested and received an updated list from the Portland USFWS (1-7-95-SP-338 dated June 27, 1995) of federally listed species that may occur in the vicinity of the proposed Hermiston Power Project. The only listed species that was newly identified as potentially occurring in the project vicinity was the peregrine falcon. This species was addressed in the Draft Environmental Impact Statement for the Hermiston Power Project (pg. 2-27). A Biological Assessment was not undertaken for the peregrine falcon because the analysis in the DEIS indicated that this species occurs only rarely in the project vicinity during spring and fall migration, with the only documented observations occurring several miles from the project vicinity. This information is based on consultation with local wildlife biologists and results of surveys (Northwest Wildlife Surveys, 1994, Wintering Bald Eagle/Peregrine Falcon Assessment Hermiston Power Project, Prepared for Hermiston Power Partnership, April 28, 1994). In addition, the Oregon Natural Heritage Program has no records of peregrine falcons occurring in the vicinity of the project (letter from C. Levesque, Oregon Natural Heritage Program, Portland, Oregon, June 7, 1995). The project is also not

10900 NE 8TH STREET, SUITE 1300, BELLEVUE, WA 98004-4405
TEL: 206-688-3700 FAX: 206-688-3952

expected to affect primary potential food sources (waterfowl) of peregrine falcons, as wetland areas are expected to be avoided during project construction. Thus, the proposed project is considered to have no effect on the peregrine falcon because this species is unlikely to occur in the project area.

Please review the Biological Assessment at your earliest convenience. If you have any questions, please call me at (206) 688-3811.

Sincerely,
Foster Wheeler Environmental Corporation

Mari A. Smultea
Wildlife Biologist

Enclosures

cc: Dawn Boorse
Dave Broadfoot

FOSTER WHEELER ENVIRONMENTAL CORPORATION

May 31, 1995
FWBEL-BPA/RCP-95-016

Ms. Connie Levesque
The Nature Conservancy
Oregon Natural Heritage Program
1205 NW 25th Ave.
Portland, OR 97210

SUBJECT: REQUEST FOR LIST OF ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES OF WILDLIFE AND PLANTS NEAR THE PROPOSED HERMISTON POWER PROJECT

Dear Ms. Levesque:

Please provide a list of endangered, threatened, proposed and candidate species of wildlife and plants that occur or may occur within the vicinity of the proposed Hermiston Power Project.

The legal location of the proposed project encompasses the following Townships (T), Ranges (R), and Sections:

T3N, R28E all Sections
T4N, R28E all Sections
T5N, R28E all Sections
T4N, R27E Sections 1, 2, 3, 10-15, 22-27, 34, 35, 36
T5N, R27E Sections 13, 24, 25, 36
T4N, R29E Sections 5-8, 19, 20, 21, 28-33
T3N, R29E Sections 5, 6

Enclosed is a map depicting the general location of the proposed project.

Please bill us for your services. If you have any questions regarding this request, please call me at (206) 688-3811.

Sincerely,

Mari A. Smultea

Mari A. Smultea
Wildlife Biologist

cc: D. Broadfoot (w/out enclosures)
D. Boorse (w/out enclosures)

10900 NE 8TH STREET, SUITE 1300, BELLEVUE, WA 98004-4405
TEL: 206-688-3700 FAX: 206-688-3952

Oregon

NATURAL
HERITAGE
PROGRAM

7 June 1995

Mari Smultea
Foster Wheeler Environmental Corporation
10900 NE 8th Street, Suite 1300
Bellevue, WA 98004-4405

Dear Ms. Smultea:

We have conducted a data system search for rare, threatened and endangered plant and animal records in the vicinity of the Hermiston Power Project.

Thirteen (13) records were noted and are included on the enclosed computer printout. A key to the fields is also included.

Please remember that the lack of rare element information from a given area does not mean that there are no significant elements there, only that there is no information known to us from the site. To assure that there are no important elements present, you should inventory the site, at the appropriate season.

This data is confidential and for the specific purposes of your project and is **not to be distributed**.

Please call if you should have any questions.

Sincerely,

Connie Levesque

Connie Levesque
Data Handler

encl: invoice

A COOPERATIVE
PROJECT OF:

The Nature Conservancy

1205 NW 25th Ave.
Portland, Oregon 97210
(503) 229-5078
FAX (503) 228-3153

FOSTER WHEELER ENVIRONMENTAL CORPORATION

July 26, 1995
FWBEL-BPA/RCP-95-042

Jacqueline V. Wyland
Division Chief
National Marine Fisheries Service
Environmental & Technical Services Division
525 NE Oregon Street
Portland, OR 97232-2737

SUBJECT: REQUEST FOR UPDATED LIST OF ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES OCCURRING NEAR THE PROPOSED HERMISTON POWER PROJECT

Dear Ms. Wyland:

Please provide an updated list of endangered, threatened, proposed and candidate species of fish that occur or may occur within the vicinity of the proposed Hermiston Power Project.

The legal location of the proposed project encompasses the following Townships (T), Ranges (R), and Sections:

T3N, R28E all Sections
T4N, R28E all Sections
T5N, R28E all Sections
T4N, R27E Sections 1, 2, 3, 10-15, 22-27, 34, 35, 36
T5N, R27E Sections 13, 24, 25, 36
T4N, R29E Sections 5-8, 19, 20, 21, 28-33
T3N, R29E Sections 5, 6

Enclosed is a map depicting the general location of the proposed project.

If you have any questions regarding this request, please call me at (206) 688-3811.

Sincerely,

Mari A. Smultea
Wildlife Biologist

cc: D. Broadfoot (w/out enclosures)
D. Boorse (w/out enclosures)

Enclosure

10900 NE 8TH STREET, SUITE 1300, BELLEVUE, WA 98004-4405
TEL: 206-688-3700 FAX: 206-688-3952

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
525 NE Oregon Street
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F/NWO3

AUG 0 8 1995

Ms. Mari A. Smultea
Foster Wheeler Environmental Corporation
10900 NE 8th Street, Suite 1300
Bellevue, Washington 98004-4405

Re: Species List Request for the Proposed Hermiston Power Project near Hermiston, Oregon

Dear Ms. Smultea:

The National Marine Fisheries Service (NMFS) has reviewed your July 26, 1995, letter to Jacqueline Wyland requesting a list of threatened and endangered species for the proposed Hermiston power project near Hermiston, Oregon.

We have enclosed lists of those anadromous fish species that are listed as endangered or threatened under the Endangered Species Act (ESA), those that are proposed for listing, and those that are candidates for listing. This inventory includes only anadromous species under NMFS' jurisdiction that occur in the Pacific Northwest. The U.S. Fish and Wildlife Service should be contacted regarding the presence of species falling under its jurisdiction.

Available information indicates that no listed Snake River salmon are in the project area or immediately downstream from it. The final critical habitat designated for the listed salmon (December 28, 1993, 58 FR 68453) does not include the proposed project area.

None of the anadromous fish species that are presently candidates for listing under the ESA are known to be present in the proposed action area.

It is important to note that candidates for listing have no status under the ESA. Once a candidate is proposed for listing, or is listed, a conference or consultation may be required.

This letter constitutes the required notification of the presence of any Federally listed endangered or threatened species or critical habitat under NMFS' jurisdiction in the permit area that may be affected by the proposed project (Appendix A to Part 330, Section C.13(5)(i)).

If you have further questions, please contact Ben Meyer of my staff, at (503) 230-5425.

Sincerely,

Elizabeth Holmes Gaar
Habitat Branch Chief

Enclosure

ENDANGERED, THREATENED, PROPOSED, AND CANDIDATE SPECIES UNDER NATIONAL MARINE FISHERIES SERVICE JURISDICTION THAT OCCUR IN THE PACIFIC NORTHWEST

Listed Species

Snake River Sockeye Salmon	*Oncorhynchus nerka*
Snake River Fall Chinook Salmon	*Oncorhynchus tshawytscha*
Snake River Spring/Summer Chinook Salmon	*Oncorhynchus tshawytscha*

Proposed for Listing

Umpqua River Sea-run Cutthroat Trout	*Oncorhynchus clarki clarki*
Klamath Mountains Province Steelhead	*Oncorhynchus mykiss*

Candidates for Listing (all Northwest stocks of the following)

Chinook Salmon	*Oncorhynchus tshawytscha*
Coho Salmon	*Oncorhynchus kisutch*
Pink Salmon	*Oncorhynchus gorbuscha*
Chum Salmon	*Oncorhynchus keta*
Sockeye Salmon	*Oncorhynchus nerka*
Sea-run Cutthroat Trout	*Oncorhynchus clarki clarki*
Steelhead	*Oncorhynchus mykiss*

APPENDIX B

HEALTH AND SAFETY—HERMISTON

A Summary of Biological and Epidemiological Studies Relating to EMF[1]

A study in Denver, Colorado, (Wertheimer and Leeper 1979) and one in Sweden (Tomenius 1986) first reported that some cancer risks were about 2 to 3 times greater for children living near certain types of power lines assumed to be carrying high current. Those researchers suggested that the finding may be related to the magnetic fields of 2 to 3 milligauss (mG) and above produced in homes by such lines. The possibility could not be ruled out, however, that other factors, or chance, may be involved. If certain power lines actually do influence cancer rates, this would mean that 2 or 3 children out of 10,000 children exposed to such lines would develop cancer each year, compared to the average rate of 1 in 10,000 per year (Ahlbom et al. 1987).

A second study done in Denver (Savitz et al. 1988) found results that were generally consistent with the earlier work on childhood cancer by Wertheimer and Leeper (1979). However, the relative risk[2] (1.5) in the new study was smaller (2 to 3) than that reported earlier. It was also on the borderline of statistical significance, which means that it could have been due to chance. Results of another study, from the Seattle, Washington, area, found no association between power lines and leukemia in adults (Severson et al. 1988). An earlier power line study in Denver by Wertheimer and Leeper (1982) also found no increase in adult leukemia. However, the earlier Denver study did find an increased risk for some other types of adult cancers.

A study done in Los Angeles County, California, provided additional support for an association between childhood leukemia risk and high-current power lines (London et al. 1991). The odds ratio for very high current lines compared to very low current and underground lines was 2.15, which was statistically significant. Following adjustment for possible confounding variables, the odds ratio was still elevated (1.73), but it was no longer statistically significant. After adjustment, the trend for increasing risk of leukemia with the estimated increase in current capacity of the power lines remained statistically significant. Associations with actual measured electric and magnetic fields, however, were weaker and not statistically significant.

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1 This information is intended to summarize briefly the large body of research on EMF. More detailed information can be found in two Bonneville Power Administration (BPA) publications incorporated here by reference: Electrical and Biological Effects of Transmission Lines: A Review (BPA 1993), and Electric Powerlines: Questions and Answers on Research into Health Effects (BPA 1994).

2 Results of case control studies are given in terms of relative risk (or odds ratio). A relative risk of 1.0 means that exposure to some factor (assumed to be EMF in this case) is the same for people with a disease (cases) as for people without the disease (controls). A value of 2 means cases were exposed to the factor twice as often as the controls. This establishes a "statistical association" between the disease and the factor. This may not represent a cause-and-effect association, however.

A study done in Sweden found that the relative risk for leukemia in children living near transmission lines was 3.8, and statistically significant, where magnetic fields were greater than 3 mG (Feychting and Ahlbom 1993). In response to the study, Sweden's National Electrical Safety Board issued a document entitled Revised Assessment of Magnetic Fields and Health Hazards (National Board for Electrical Safety 1993). It states that the agency "has revised the previous assessment of health hazards to the extent that the Board in the future *will act on the assumption* that there is a connection between exposure to power-frequency magnetic fields from power lines and childhood cancer, when preparing regulations on electrical installations." The document also notes, "It should be stated that a connection between cancer and magnetic fields has not yet been scientifically proven..." (National Board for Electrical Safety 1993.) This apparently is the first, and to date only, a time cause-effect association between EMF and cancer has been assumed by a national governmental organization.

A second report by the Swedish National Electrical Safety Board was issued in 1993 (Lindgren 1993). The Board concluded that, ". . . there is currently strong suspicion of a relationship between magnetic fields and child leukaemia, while the suspicion of a relationship between magnetic fields in the working environment and cancer is moderately strong." The Board believes that a strategy of caution is justified; this includes reasonable measures for reducing magnetic fields from new power facilities. The Board is actively investigating possible magnetic field standards for transmission lines in Sweden.

Two other government organizations in Sweden have apparently not determined that regulations for EMF are necessary at this time. These are the National Board of Occupational Safety and Health, and the Swedish Radiation Protection Institute.

Results of a larger study done in Denmark indicated no increased risk of leukemia for children living near transmission lines (Olsen et al. 1993). However, there was a statistically significant elevated risk of combined cancer. A Danish blue-ribbon panel examined the EMF issue and recommended against government regulation: "[There is] no scientific reason for establishing standards with respect to high-current plants. New research results must be followed closely in the future." (EMF Health and Safety Digest 1993).

The results of the child cancer studies in Sweden and Denmark were recently combined with results of another transmission line study conducted in Finland (Ahlbom et al. 1993). For child leukemia, the combined results of the three Nordic studies showed a relative risk of 2.1, which was statistically significant (based on 13 cases). No statistically significant risks were found for nervous system tumors, or for lymphoma.

Earlier studies in Rhode Island (Fulton et al. 1980), in Taiwan (Lin and Lu 1989), and in England (Myers et al. 1985) found no significant association between childhood cancer and power lines. Other community studies in England found no consistent evidence to support a power line-cancer association (Coleman et al. 1985, McDowall 1986).

The results of 13 studies of cancer in children living near power lines were combined in an analysis by Washburn et al. (1994). The combined relative risks for leukemia and nervous system tumors were 1.49 and 1.89, respectively, and both were statistically significant. The authors of the

analysis concluded that the risks they found require further investigation, and should be interpreted cautiously.

A study in Washington State first reported that men in various "electrical occupations" had died more frequently from leukemia than men in other occupations (Milham 1982). Other studies reported similar findings, suggesting an increased risk of around 20 to 50 percent (Savitz and Calle 1987, Coleman and Beral 1988). However, the studies were primarily based on information only from death certificates (i.e., job title, and cause of death). It therefore was not possible to determine whether the preliminary findings were related to electric and magnetic fields, or to other exposures such as those from chemicals.

A large study of 223,000 electric utility workers in Canada and France found statistically significant elevated risks of up to threefold for certain leukemia types (Thériault et al. 1994). These risks were associated with cumulative magnetic field exposures above the median. However, there were inconsistencies in results among the three utilities involved in the study, and there was no clear indication of a dose-response trend between cancer risk and magnetic field exposure.

Research on electric and magnetic fields and cancer was reviewed in a draft report by the U.S. Environmental Protection Agency (EPA) (EPA 1990). The EPA concluded that magnetic fields are a possible but unproven cause of cancer in humans and that more research is needed. The EPA's Science Advisory Board (SAB) also reviewed the issue and concluded: "Human epidemiologic data report an association between surrogates for electric and magnetic field exposure and an increased incidence of some types of cancer, but the conclusion of casualty is currently inappropriate because of limited evidence of an exposure-response relationship and the lack of a clear understanding of biologic plausibility." (SAB 1991). The SAB recommended that the EPA report should be rewritten to correct inconsistencies in the report (SAB 1991).

A few studies have investigated possible effects of EMF exposure on pregnancy. Wertheimer and Leeper (1986 and 1989) reported that fetal losses were more prevalent in women using electric blankets or heated water beds. Women who lived in homes with ceiling cable heat experienced higher fetal losses during the onset of the cold season, when field exposure was assumed to be increasing. A recent study from Finland suggested an association between early pregnancy loss and elevated magnetic fields in residences (Juutilainen et al. 1993). Authors of the study cautioned that their results should be interpreted cautiously because of the small number of exposed subjects.

In addition to research on humans and laboratory animals, several studies have investigated possible effects of transmission line electric and magnetic fields on plants, wildlife, and domestic animals (BPA 1993). Crop growth is not noticeably affected by even the largest transmission lines. Trees that are allowed to grow too close to transmission line conductors can be damaged by the strong electric fields near the conductors. Normally trees are not allowed close to conductors to prevent electrical flashover, i.e., spontaneous arcing of electrical current from lines to trees.

Studies have shown that honey bees in commercial hives can be adversely affected by strong transmission-line electric fields. Shocks received by bees while in the hive cause decreased honey production and increased mortality. As a precaution, BPA recommends that bee hives not be placed directly on the transmission line right-of-way (ROW).

Wildlife respond to effects (e.g., changes in food supply) of cleared ROWs. How- ever, there is no evidence that their behavior is noticeably affected by the presence of electric and magnetic fields. Few studies have attempted to determine whether wildlife may be affected by long-term exposure to these fields. As noted above, some effects of electric and magnetic fields have been found in laboratory animal studies. It is not known whether such effects occur in wildlife similarly exposed to these fields.

Several studies have looked at the behavior and production of livestock raised near transmission lines. These studies found no indication that electric or magnetic fields have any major effects on livestock. Most of the studies were not designed to detect any subtle field effects. A recent study of sheep found no effects of EMF from a 500-kV line on reproductive cycles, growth, stress, or on secretion of the hormone melatonin (Lee et al. 1993). However, a possible effect of EMF on one component of the immune system in sheep was found (Hefeneider et al. 1994). Levels of the hormone interleukin-1 (IL-1) tended to be lower in blood samples taken from sheep raised beneath the 500-kV line compared to sheep away from the line in a control area. There were no apparent effects of EMF on the health of the sheep, and the biological significance, if any, of the finding has not been determined.

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