PART 4

Chapter 2 Updates

CHAPTER 2

Proposed Action and Alternatives

2.1 Introduction

This section contains a description of the Proposed Action and alternatives to the Proposed Action. Section 2.2 describes the ~~project proponent's~~ site selection process used by the project proponent in considering options for siting its proposed energy facility and ancillary facilities. Section 2.3 describes the Proposed Action, ~~other potential alternatives sites considered, site-specific and technologic alternatives, and the two alternatives being~~ which is considered in detail in this FEIS. Section 2.4 describes ~~:~~ the ~~Proposed Action and~~ No Action alternative, which is also considered in detail in this FEIS. Other alternatives, including alternatives considered but eliminated from detailed analysis in this FEIS, are described in Section 2.5. Section 2.6 describes other projects in the project vicinity that could potentially contribute to cumulative impacts.

2.2 Site Selection

2.2.1 Alternative Energy Facility Sites

Selection of an energy facility site is typically based on a common set of factors or criteria, such as the degree of risk in obtaining regulatory approval, the availability of natural gas and water to operate the facility, cost associated with upgrading natural gas supply and impacts to the grid to interconnect and operate the facility; and access to electric transmission system facilities to export power onto an electric system grid. In the energy development industry, no set threshold exists for determining whether a site is "acceptable" or "not acceptable" because the degree of acceptable risk and cost will vary from company to company.

Described below are criteria considered in selecting the COB Energy Facility. Additional information concerning other potential sites and vicinities is provided in Section 2.5.

2.2.2 Infrastructure

A potential site must be within a reasonable distance of the infrastructure needed to construct and operate a gas-fired power project. This includes the following:

- Transportation: The potential site should be located near a railroad (siding) and roads with the load capacity to accommodate heavy loads. During construction, heavy equipment and materiel should be brought as close to the site as possible via rail and then moved to the potential site by road. In addition, adequate roads are necessary to transport construction workers to the site. During operation, heavy trucks will deliver supplies to the ~~facility~~Facility, and a small operational crew will work at the site. The farther away from rail access and an adequate road network a site is, the higher

construction costs, acquisition of more land or rights-of-way,~~,~~ and greater probability of significant environmental impacts.

- Transmission Interconnection: The potential site should be located near a major electric transmission line or substation that can accommodate the proposed ~~power plant~~Energy Facility capacity and not impede the integrity of the power grid. A power plant must be able to interconnect with electric transmission facilities (electric transmission lines or substations) in order to move the power to market. If the potential site is not reasonably close to electric transmission facilities that can accommodate the load, it is neither economical nor practical to construct the project at that site. The size (in kV) of the electric transmission line, capacity (availability to carry additional electrical load), and distance from the generation source are key considerations. If the size or capacity of an existing electric transmission line is insufficient, the existing electric transmission lines would need to be upgraded or a new electric transmission line constructed so that the load could be accommodated. If a new electric transmission line must be constructed to make an interconnection or to support an interconnection, construction costs will be increased, more land or rights-of-way acquired, and, depending upon local land and environmental attributes, a greater probability environmental impacts may be expected. Similarly, the capacity of an existing substation to accommodate increased load is important. Existing substations lacking in capacity or space for expansion would require costly upgrades to accommodate power generated from the new ~~power plant~~Energy Facility.

- To meet transmission objectives, an ideal energy generation site is strategically located along a major electrical transmission line through which the plant can provide maximum market response to regional power demands, at a "trading hub" location on the power grid having sufficient transmission and substation capacity to meet this objective. The primary purpose and need for the COB ~~facility~~Energy Facility's meeting market conditions are provided at the location near the Captain Jack Substation (see ~~Applicant's~~project proponent's Purpose and Need Statement, Section 1.2).

- Natural Gas Transmission: The potential site should be located near a major natural gas pipeline that has capacity to supply natural gas to the ~~power plant~~Energy Facility. Key issues on siting near a natural gas pipeline include sufficient capacity (size of pipeline), availability (amount of capacity already committed), pipeline pressure, and distance to the ~~power plant~~Energy Facility. Potentially cost-prohibitive upgrades may be required for a natural gas pipeline that does not have adequate capacity or pressure. If pipeline pressure is insufficient, a compression can be added, but this increases project costs as well as the probability of significant adverse environmental impacts.

- Water: Gas-fired, combined-cycle power plants require a source of water, but the amount of water can vary significantly depending on the cooling option selected (water or air). In most gas-fired power plants, process wastewater is also discharged. Power projects proposed for unincorporated areas can use either surface water or ground water. The source must be proven, in sufficient quantity, and reliable. Depending upon the chosen design, the surrounding land area must be capable of managing and/or disposing of stormwater and noncontact process water without probable significant adverse impacts to surface and groundwater resources.

2.2.3 Construction Feasibility

Site Size: A potential site must be able to accommodate the power plant dimensions, including the availability of construction laydown and staging areas during the construction phases of the project. The site size can vary depending on the power block, cooling-option, and ancillary requirements, such as wastewater treatment, equipment storage, and security and fire access perimeter.

Topography: To the degree possible, a potential site should be level to minimize the amount of cutting and filling. The more site-preparation work needed, the more costly and difficult will be the construction. In addition, usually there is a greater probability of significant adverse environmental impacts associated with project sites that require significant modification.

Geotechnical: In siting power projects, soil conditions and seismic considerations are important factors. Unstable soils require significant and costly foundations that raise overall project costs, insurance costs, and overall risk factors. Seismic concerns are related to known faults and liquefaction.

Flooding: Potential sites subject to flooding are normally eliminated from further consideration.

2.2.4 Environmental/Land Use/Community/Acceptance

Environment: The potential site should be capable of development as an energy facility such that, to the degree possible, environmental impacts can be minimized or will be capable of mitigation. Key environmental considerations include:

- Air quality - A potential site should be in an attainment area; if not, there should be credits or other mitigation available to offset impacts. The project should avoid significant impacts on Class I areas. Significant impacts could lead to the denial of project permits or severely limit project operations.
- Wetlands and other Water Bodies - A potential site should avoid or have minimal impacts on wetlands or other surface waters, including streams. Impacts on wetlands and streams often require local, state, and Federal project approvals and could lead to a denial of siting the project at the selected location.
- Threatened or endangered species - A potential site should avoid impacts to threatened or endangered species or their habitat. Although in some cases impacts (taking) are allowed, it is a costly and often contentious process to complete with long-term monitoring. Potential impacts could result in denial of permits to construct the project.
- Visibility/aesthetics – If possible, a potential site should be located to minimize its visibility to residents and areas of recreation (e.g., parks, campgrounds, etc.).
- Cultural resources – A potential site should avoid disturbance of cultural resources.
- Water - Impacts on water, either from the use of or discharge to, can result in costly project engineering, construction, and operation. Although most potential impacts can be overcome with engineering and technology, the overall cost could make the project uneconomical.

- Land Use: The potential site should be located in an area compatible with local comprehensive planning guidelines and documents and zoned for the proposed activity. Although the land use laws and regulations may be changed over time to allow the construction of the project, significant uncertainty concerning whether a power plant is an allowed use or not undermines project feasibility; and even if permitted, a project could be saddled with costly construction and operational limitations and mitigation.
- Community Acceptance: To the degree possible, the construction and operation of a power plant should be an accepted and welcome addition to the local community, bringing economic gain. Generally, the greater the degree that all other siting considerations can be met, the higher the community acceptance.

~~No Action~~

~~In the No Action Alternative, BPA would decide not to provide the requested connection to the regional power grid or BLM would decide not to provide an easement for construction of an electric transmission line across Federal lands. Without these approvals, the proposed Energy Facility would not be feasible. Thus, in the No Action Alternative the proposed Energy Facility would not be built.~~

2.3 Proposed Action

In the proposed action, BPA would provide an interconnection to the regional power grid, and BLM would grant an easement allowing the power line to be built on Federal lands. The Energy Facility would be built and operated by the project proponent. ~~It~~ The Energy Facility would consist of a 1,160-MW, natural gas-fired, combined-cycle power generation plant. Based on the conditions of the electric power market, the project proponent may decide to construct the ~~facility~~ Facility in one or two phases.

A new electric transmission line~~,~~ approximately 7.2 miles in length~~,~~ would be built by the project proponent and would deliver electric power from the Energy Facility to the regional power grid at BPA's Captain Jack Substation. Figure 2-1 shows t~~T~~he locations of the Energy Facility and its related or supporting facilities. ~~are shown in Figure 2-1, and~~ Figure 2-2 shows the BLM-~~owned~~managed parcels.

The proposed Energy Facility would be fueled by natural gas from the existing ~~PG&E~~ Gas Transmission Northwest (~~PG&E~~ GTN) pipeline. The fuel would be ~~and~~ delivered through an approximately 4.1-mile, ~~approximately~~ 20-inch-diameter, natural gas pipeline that would be constructed from the GTN Bonanza Compressor Station along the rights-of-way of existing Klamath County roads. ~~The natural gas pipeline is expected to be 20 inches in diameter.~~

~~Water would be needed by t~~The proposed Energy Facility would need water to generate steam for the combined-cycle operation. Water would also be needed ~~, and~~ for demineralized water production, potable water and sanitary systems, and service water. The water~~-~~supply well system would consist of an existing well and two additional water supply wells. The water supply well system would be configured and constructed to withdraw water only from the deep zone aquifer and would be isolated from the shallow

zone aquifer and surface water. The existing well, ~~known as~~ the Babson well, was originally drilled to depths exceeding 5,000 feet for oil and gas exploration in the 1920s and has partial obstructions at depths of 1,870 and 2,050 feet. The Babson well would be sealed through the shallow zone aquifer and ~~through~~ approximately 1,100 feet of nonbearing rock to approximately 1,500 feet below the ground surface (bgs). No other Langell Valley area wells or water rights in the deep aquifer system are known to exist. Two additional water supply wells would be drilled to a depth of approximately 2,000 feet bgs.

Once withdrawn, the water would be pumped through a 2.8-mile water supply pipeline to a raw water storage tank located at the Energy Facility site. Under average annual ambient conditions with supplemental duct firing, the Energy Facility would discharge approximately 22 gallons per minute (gpm) of process wastewater. ~~would be discharged by the Energy Facility. Three~~ Two alternatives for disposal of the process wastewater are proposed: 1) beneficial use of the water for irrigated pasture, or 2) evaporation in an onsite, lined evaporation pond~~, or 3) temporary storage onsite and hauling to an offsite wastewater treatment plant (WWTP) for disposal~~.

The principal components of the proposed action are as follows:

- A new ~~-~~1,160-MW, air-cooled, natural gas-fired, combined-cycle electric power generation plant located near Bonanza, Oregon, on 50.6 acres of land
- A new ~~-~~7.2-mile, electric transmission line to deliver electricity from the proposed Energy Facility to BPA's Captain Jack Substation
- A new ~~-~~4.1-mile, natural gas pipeline to deliver fuel to the proposed Energy Facility site
- A water-~~-~~supply well system consisting of an existing well and two additional water supply wells
- A 2.8-mile ~~-~~water-~~-~~supply pipeline between the water supply wells and the Energy Facility
- A 31-acre ~~-~~irrigated, pasture area for beneficial use of process wastewater. Process wastewater would be delivered via a 3,770-foot irrigation pipeline.
- A 20-acre evaporation pond if process wastewater is managed by an onsite, lined evaporation pond
- A 4.7-acre ~~-~~stormwater infiltration basin
- A 1.5-acre ~~-~~stormwater pond

Each of these components is described in greater detail in the next subsections. Table 2-1 ~~shows a , and a comparison of~~compares project impacts and specifies mitigation measures ~~is shown in Table 2-1~~. Table 2-1 includes many of the terms and conditions in the proposed order (PO) issued by the Oregon Department of Energy on March 16, 2004.

2.3.1 Electric Power Generation Facility

2.3.1.1 Site Location

The proposed Energy Facility site is located 3 miles south of Bonanza, Oregon, on the east side of West Langell Valley Road No. 520 in Klamath County. Access to the site would be from Langell Valley Road No. 520 (see Figures 2-1, Site Map, and 2-2, Facility Map). The Energy Facility site is located on 50.6 acres of property totaling 749 acres in Sections 22, 23, 25, and 26 of Township 39 South, Range 11 East. The property, ~~is~~ currently undeveloped, ~~and~~ has historically been used for agricultural activities as described below. Figure 2-2 shows BLM-owned parcels.

Specific criteria are considered to determine the location when siting a combined-cycle power plant such as the proposed Facility. Key criteria include proximity to transmission, fuel supply, and water supply. Additional criteria include site size, topography, geotechnical issues, flooding potential, transportation, environmental impacts, and nearby residences.

The project location selected for the proposed Facility had the highest potential for meeting these criteria, as described in the following list:

- **Electric transmission interconnect**. The Energy Facility site would connect to the existing BPA Captain Jack Substation, which is part of the California- Oregon Intertie~~, known as the "Super Highway Crossroads" of Energy for the Pacific Northwest and California~~ and near the California-Oregon border trading hub (geographic location where multiple participants trade power), one of three key power marketing price reference points in the West.
- **Fuel supply**. The ~~PG&E~~ GTN Bonanza Compressor Station is located 4.3 miles from the Energy Facility site.
- **Water supply**. The Energy Facility would use water from a deep aquifer with no demonstrated connection to the shallow water system.
- **Site size**. The land area fits the proposed Energy Facility dimensions, including construction laydown areas needed during the building process.
- **Topography**. The topography would allow sufficient cut and fill for a level Energy Facility site.
- **Geotechnical**. The soil is expected to be suitable, with sufficient stability and low potential for liquefaction.
- **Flooding potential**. The Federal Emergency Management Agency (FEMA) flood insurance rate map for the proposed Facility (panel number 410109 1250B) shows minimal flooding potential.
- **Transportation.** The Energy Facility site is located approximately 7 miles from the city of Malin, which has suitable rail for the construction and support of the proposed Facility.
- **Environment.** Generally speaking, t~~T~~he proposed project would have no significant adverse effect on the environment with the implementation of mitigation measures.

Mitigation and habitat improvement practices and measures that would be employed are described in more detail in the EIS and a Habitat Mitigation and Natural Area Revegetation Plan (the Revegetation Plan) that is part of the Biological Assessment (BA) (Appendix C to the EIS).- Impacts that cannot be avoided (including those that are reduced in their level of significance, but remain unavoidable impacts of the proposed project) are disclosed in Section 3.1.3 of this EIS~~, Section 3.1.3~~.

- **Nearby ~~R~~residents.** The closest resident to the proposed Energy Facility site is located approximately 5,700 feet northwest of the Energy Facility. However, because of topography, this resident would not be able to view the Energy Facility. ~~because of topography.~~ The closest resident to the- Energy Facility with an unobstructed view is located approximately 6,700 feet southeast of the Energy Facility. The closest resident to the electric transmission line is located approximately 3,000 feet east of the electric transmission line. The closest resident to the water supply wells is located approximately 3,500 feet southwest of the water supply well site.

~~Eleven alternative~~The project proponent identified 11 other potential sites or vicinities in Oregon and Washington (see Figure 2-3) ~~were identified by the project proponent~~ as having development potential. None of these ~~alternative~~ sites successfully met the criteria identified above, and none of the sites met the proponent's fundamental purpose and need for the generation facility.

2.3.1.2 Power Generation Facilities

The proposed Energy Facility would consist of four General Electric (GE) model 7FA (or equivalent) combustion turbine generators (CTGs), four, three-pressure heat recovery steam generators (HRSGs), and two steam turbines. The Energy Facility would be fueled by natural gas used in the combustion turbines. Expanding gases from combustion would turn rotors within the turbines that are connected to electric generators. The hot gases exhausted from the combustion turbines would be used to produce steam in the HRSGs. The steam from two HRSGs would then be expanded through a steam turbine that drives its own electric generator, thus creating additional electrical energy. Spent steam from the HRSGs would be condensed and routed to the air-cooled condensers. Steam from the exhaust of the steam turbine generator (STG) would be condensed in a surface condenser, with the condensate routed back to the HRSGs as boiler feedwater to complete the closed steam cycle.

The CTGs and HRSGs would be outdoor units with thermal insulation and acoustical attenuation. To increase steam-generating capacity, a duct burner system would be included in each HRSG. The duct burner would be single-fuel, using natural gas only. The duct burner would increase both the steam generated in the HRSGs and the CTG electrical output. Additional equipment dedicated to each power block would include surface condensers, air-cooled condensers, generator step-up transformers, electrical distribution gear, and associated ancillary equipment.

2.3.1.3 Site Facilities

Access to the site would be from West Langell Valley Road No. 520. In addition to the combustion turbines, steam turbines, and air-cooled condensers, the site would include a laydown and storage area, administrative/control room building, warehouse/maintenance

building, water treatment facilities, raw water and demineralized water storage tanks, process wastewater storage tanks, stormwater pond, septic tank/leach field, and switchyard. If the onsite evaporation pond is used for process wastewater management, the process wastewater tanks would not be required.

The following are the approximate dimensions of major Energy Facility structures and visible features:

- Power generation equipment and systems: approximately 12 acres by 54 feet tall
- Stacks: approximately 150 to 200 feet tall
- Air-cooled condensers: approximately 4.3 acres and 125 feet tall
- Raw water storage tank: 113 feet in diameter and 40 feet tall
- Laydown and storage area: approximately 6.3 acres
- Administration/control room building: approximately 0.2 acre by 22 feet tall
- Warehouse/maintenance building: approximately 0.2 acre by 22 feet tall
- Water treatment facilities
  - Water treatment building—approximately 0.2 acre by 22 feet tall
  - Demineralized water storage tank—approximately 37 feet in diameter by 40 feet tall
- Wastewater alternatives
  - Beneficial use of the water for irrigated pasture: approximately 31 acres, with ~~and~~ two wastewater storage tanks 100 feet in diameter by~~and~~ 40 feet tall
  - Lined evaporation pond alternative: approximately 20 acres with 7-MG storage capacity
  - ~~Temporarily storing onsite and hauling to an offsite WWTP for disposal: two wastewater storage tanks 100 feet in diameter and 40 feet tall~~
- Stormwater pond: approximately 1.5 acres
- Stormwater infiltration basin: approximately 4.7 acres
- Septic tank/leach field: less than 1 acre

2.3.1.4 Water Supply

The Energy Facility would use water from a deep aquifer system intercepted by an existing well known as the Babson well. (No other Langell Valley area wells or water rights in the deep aquifer system are known to exist.) A well system consisting of the Babson well and two additional water supply wells would be used to withdraw water from the deep zone aquifer. The water withdrawal would be subject to a water right permit issued by the state of Oregon.

The two additional water supply wells are necessary for back-up to ensure reliability of the water supply to the Energy Facility. Whether the Energy Facility is constructed in phases, the water well supply system will be constructed at one time. The two additional water supply wells would be located in close proximity to the existing well.

During operations, the primary uses of water at the proposed Energy Facility would be for steam generation, demineralized water production, potable water and sanitary systems, and service water. Water also would be available for fire suppression. During construction, water would be used for dust suppression, compaction, vehicle and equipment cleanup, and miscellaneous construction-related uses. Drinking water for construction workers would be bottled water or other potable water trucked to the Energy Facility.

When operating, water use in the Energy Facility would vary daily and seasonally in response to fluctuating electricity demand and weather conditions. As a result, actual daily water use at the Energy Facility is estimated to vary from 0 ~~gallons per minute (~~gpm~~)~~ when the Energy Facility is offline up to a maximum of 210 gpm (0.30 mgd or 0.92 ac-ft/day or 0.47 cfs). For average annual conditions with duct firing, it is anticipated that the average withdrawal rate from the water supply wells would be approximately 72 gpm (0.10 mgd or 0.31 ac-ft/day or 0.16 cfs). In addition, 90 gpm (0.13 mgd or 0.40 ac-ft/day or 0.16 cfs) would be required to irrigate up to 16 acres of land between March 1 and October 31 of each year.

Water from the water supply well system would be pumped through a 2.8-mile, 6-inch-diameter water supply pipeline to a 3.0-MG raw water storage tank at the Energy Facility.

2.3.1.5 Fuel and Chemical Storage Facilities

Construction. During construction, fuels and chemicals anticipated to be used include diesel fuel, gasoline, lubricants and oils, solvents, paints, ethylene diamine triacetic acid (EDTA), and surfactant. The diesel fuel and gasoline would be stored in aboveground storage tanks that would be located within secondary containment. The chemicals would be stored in drums and containers located inside construction storage trailers. Spill kits with absorbent materials would be available in the event of a spill of hazardous chemicals.

Operation. Natural gas would be delivered from the existing ~~PG&E~~ GTN pipeline system through a 4.1-mile, natural gas pipeline constructed from the Bonanza Compressor Station along the rights-of-way ~~(ROW)~~ of existing Klamath County roads. Natural gas would not be stored onsite.

There would be diesel fuel storage for the fire water pump at the Energy Facility and for the back-up generators at the water supply well system. The diesel fuel storage capacity would be approximately 100 gallons and 4,300 gallons (two tanks each with a capacity of approximately 2,150 gallons) for the fire water pump and back-up generators, respectively. Diesel fuel would be purchased from fuel distributors. Vehicles used would be fueled and serviced offsite. No storage of fuels or lubricants for vehicles would be necessary onsite.

Lubricants and oils for the generators, turbines, transformers, and miscellaneous electrical equipment would be stored in drums and containers. The lubricants and oil would be stored indoors and within appropriate containment areas.

Water treatment chemicals would be stored in aboveground storage tanks or portable plastic tanks (totes). The water treatment chemicals include sulfuric acid, sodium hydroxide,

EDTA, hydrazine, ammonia hydroxide, sodium hypochlorite, sodium bisulfite, sodium metabisulfite, sodium nitrite, organic phosphate, sodium phosphate, lime, soda ash, magnesium chloride, polymers, filter acid, and iron chloride. Cleaning fluids and detergents would be used for periodic cleaning of the combustion turbine blades. The chemicals would be stored in totes or aboveground storage tanks situated in the appropriate containment areas designed to hold the volume of the liquids stored plus freeboard, according to applicable regulations and best management practices (BMPs).

Aqueous ammonia would be stored in a 30,000-gallon, aboveground storage tank. The tank would be contained within a bermed area and would be designed in accordance with applicable industry specifications. The tank would be equipped with a level gauge and would be monitored from the control room. The area for delivery of aqueous ammonia to the storage tank also would be bermed.

2.3.1.6 Laydown and Storage Areas

The proposed Energy Facility would have a 71~~.0~~-acre, construction parking lot and laydown areas for pipe, tool, and material storage, and trailers. During the life of the Energy Facility, major maintenance and construction projects would require a storage and work area. In addition, large items would require outdoor storage. An approximately 6-acre laydown and storage area would be part of the 50.6-acre Energy Facility site.

2.3.1.7 Fire Prevention and Control

Systems for fire prevention, detection, and control would be installed at the proposed Energy Facility. The systems would be installed in the buildings and yard areas as required by the National Fire Protection Association (NFPA) and the Facility insurer. The systems would be designed to meet local, state, and NFPA standards.

The main fire protection system would include a dedicated water storage system, hose stations, and fire pumps. Water would be supplied by the deep aquifer well system described in Section 2.3.4. A portion of the 325,000-gallon, demineralized water storage tank would be dedicated to the fire protection system.

The fire detection system would continuously monitor the Energy Facility, provide indication of the location of fires, warn the Energy Facility personnel, and activate the fire protection system. The combustion turbine enclosures would include carbon dioxide fire-extinguishing systems.

Smoke detectors, heat detectors, manual alarm stations, and indicating devices would be installed throughout the Energy Facility. Portable fire extinguishers would be placed at key locations.

2.3.1.8 Wastewater Management, Beneficial Use, and Disposal

Construction. Wastewater would be generated during construction and testing/commissioning of the Energy Facility from washdown of concrete trucks after concrete loads have been emptied; washing of exteriors of construction equipment and vehicles to remove accumulated dirt; rinsing of the water systems; and hydrostatic testing of the natural gas and water supply pipelines. Wastewater from concrete truck washdown and cleaning of construction equipment would be managed so that there would be no discharge

offsite or discharge to surface waters. Wastewater from the flushing and hydrostatic testing (testing and commissioning wastewater) is estimated to be 6.5 MG. Hydrostatic testing and flushing would be performed sequentially with water filtered between steps so that water can be reused and recycled to the extent possible. During construction and testing/ commissioning, portable toilets would be provided for onsite sewage handling and would be pumped out and cleaned regularly by a qualified contractor.

Operation. The proposed Energy Facility would use water primarily for steam generation, demineralized water production, potable water and sanitary systems, and service water. Water also would be available for fire suppression. Process wastewater from the Energy Facility would be managed by one of three two alternatives:

- Beneficial use of the water for irrigated pasture
- Evaporation in an onsite, lined evaporation pond

Temporary storage onsite and hauling to an offsite WWTP for disposal

Irrigated Pasture Beneficial Use:. If process wastewater is managed by beneficial use of the water for irrigated pasture, water developed generated during the winter months would be stored in on-site tanks and combined with process water produced in the summer months to irrigate onsite acreage. The Energy Facility site and land immediately adjacent to the Energy Facility under option by the project proponent, encompasses sufficient acreage with soil types suitable for this activity. Process water can be managed without exceeding annual salt loading rates typical of nearby irrigated lands, or of other facilities with permits to use similar water in a similar fashion. Approximately 31 acres would be required to manage the total volume of process water available without exceeding typical total dissolved solids (TDS) loading rates that currently result from irrigated agriculture in the area.

The process water would be used to improve grazing forage yield in areas currently without irrigation, and possibly to enhance the wildlife forage yield in habitat mitigation areas. This activity represents a beneficial use of the water that would not be made if it were evaporated or hauled offsite for disposal. The irrigated use would occur only in areas with well-drained soil and with suitable slopes to minimize the potential for surface runoff or erosion. The irrigated use would not occur in areas that are drained by subsurface drain tiles to minimize any potential discharges to surface water. Annual application rates would occur at levels substantially lower than gross irrigation requirements for full irrigation, and the irrigated use would not result in recharge to groundwater during periods of irrigation.

Onsite Evaporation Pond:. If process wastewater is managed by evaporation, an optional backup of a 20-acre evaporation pond 20-acre evaporation pond would be used to manage process wastewater. The pond would be sized to store approximately 7 MG and lined to protect groundwater. would be used to manage process wastewater. The evaporation pond alternative is a contingency only, and it the pond would not be built until such time as it is determined that process wastewater management by irrigated--pasture beneficial use does not function as designed. If the need for the evaporation pond is needed, occurs, the water treatment system at the Energy Facility would be changed to increase the cycling of the water and to reduce the quantity of wastewater to be discharged to the evaporation pond.

The evaporation pond would most likely be designed to operate passively. However, to reduce the size of the footprint, a spray enhancement system would be installed if it were

economically viable. A wastewater stream pipeline would take wastewater from the Energy Facility to the evaporation pond. The evaporation pond would be designed and sized to contain sediment from the wastewater for the life of the plant with minimal need to clean out the sediment. There would need to be sufficient freeboard in the evaporation pond to account for sediment accumulation. The evaporation pond would be cleaned periodically, and sludge and other solids that would accumulate from evaporation of the wastewater would be removed and disposed of at an approved landfill.

The pond would be designed to include a composite liner system for containment of wastewater and sediment. Bentonite would be added to the soil at the base of the evaporation pond, mixed to a depth of approximately 12 inches, and then compacted to achieve a permeability of greater than $1x10^{-6}$ centimeters per second (cm/sec). An alternative to the bentonite-treated soil would be to use a bentomat geotextile system. The bentomat geotextile system is available with a permeability as low as $5x10^{-9}$ cm/sec. A 60-mil HDPE liner would be placed over the bentonite-treated soil or the bentomat geotextile system~~,~~ to form the top layer of the composite liner system.

~~*Storage and Hauling to Wastewater Treatment Plant*: If this alternative were to be selected, process wastewater would be managed by temporarily storing onsite and hauling to a WWTP for offsite disposal. The project proponent has contacted the two municipal WWTPs in Klamath Falls—the South Suburban Sanitary District and the City of Klamath Falls Sanitary District. The ability of these two WWTPs to accept wastewater from testing and commissioning of the Energy Facility and the wastewater from operation of the Energy Facility is presently being evaluated. According to managers at both facilities, each would be required to evaluate whether they can meet the EPA categorical standard to accept industrial waste or whether local ordinance provides for acceptance of truck-hauled wastewater. During the life of the Energy Facility, other WWTPs may be constructed or considered for management of wastewater generated at the Energy Facility. The project proponent would arrange with a trucking company to routinely haul the wastewater stored in the wastewater storage tanks at the Energy Facility to the WWTP.~~

Sanitary wastewater from restroom and shower facilities would be routed to an onsite septic tank, which would discharge to a leach field. Approximate flows of up to 1,500 gallons per day or about 1 gpm are expected.

2.3.1.9 Stormwater Management

Construction. During construction, stormwater would be managed according to NPDES General Construction Permit 1200-C, issued by the Oregon Department of Environmental Quality (ODEQ), and an erosion and sediment control plan. In general, construction erosion control would consist of BMPs, including techniques such as hay bales, silt fences, and revegetation~~,~~ to minimize or prevent soil exposed during construction from being carried off the site.

Operation. Stormwater would be managed by implementing BMPs, such as containment, covering, good housekeeping, preventive maintenance, and spill prevention. The drainage from disturbed areas at the Energy Facility site would be designed to drain to a stormwater pond. The stormwater pond would be sized to detain approximately 750,000 gallons (2.3 acre-feet) of water based on a 25-year storm event.

Stormwater would be managed through three systems—the plant drains system, stormwater sewer system, and offsite stormwater diversion system.

Plant Drains System. The plant drains system would be routed through an oil/water (o/w) separator and then back into the raw water process for plant use.

Stormwater Sewer System. The stormwater sewer system is designed to accommodate a 100-year, 24-hour storm event and would collect stormwater from rooftops, parking lots, and landscaped areas. This storm sewer system would consist of ditches, culverts, and piping as required that are routed to the 1.5-acre stormwater pond. ~~Two alternatives are available were considered for managing the stormwater d~~Discharge from the stormwater pond ~~. The preferred alternative~~ would ~~discharge the stormwater into~~be routed to a 4.7-acre infiltration basin. The infiltration basin is designed to allow the stormwater to infiltrate into the ground. ~~The second alternative would to discharge the stormwater into the West Langell Valley Road drainage ditch is no longer proposed, and consequently has been eliminated from further consideration in this EIS.~~

~~. From the point where the stormwater is discharged into the drainage ditch, the stormwater would travel approximately 8,000 feet before it discharges into the High Line Levee Ditch. The High Line Levee Ditch discharges into the Lost River.~~

Offsite Stormwater Diversion System. Stormwater run-on to the Energy Facility site would be prevented by diverting the water around the Energy Facility into natural drainages and the West Langell Valley Road drainage ditch. For the transmission line access roads, culverts would be properly sized and designed where the access road crosses intermittent creeks to facilitate flow of stormwater or snowmelt runoff and to minimize erosion. Access roads would be surfaced with gravel to minimize erosion. Drainage would be maintained along the route of the access roads to prevent ponding of stormwater or snowmelt runoff.

2.3.1.10 Solid Waste Management

Construction. A variety of nonhazardous, inert construction wastes would be generated during construction. The major solid waste types would be concrete waste from foundation construction, wood waste from wood forms used for concrete construction, and scrap steel. Additional wastes include erosion-control materials such as straw bales and silt fencing, and packaging materials for parts and equipment.

Generation of wastes from construction would be minimized through detailed estimates of materials needs and through efficient construction practices. Approximately 350 tons per month of solid waste would be generated. Wastes generated during construction would be recycled as much as feasible. Recyclable materials would be separated from the solid waste stream. Solid waste would be stored in onsite roll-off bins. Any solid waste removed from the sumps or drains would be placed in barrels. Solid waste would be collected periodically by a private contractor and hauled to a licensed disposal facility. The nearest licensed facility is the Klamath County Landfill~~,~~ located about 35 miles from the Energy Facility site.

During construction, fuels, lubricant chemicals, and welding gases would be handled by trained personnel. The material would be in controlled storage until used, and any empty containers or waste material would be segregated in storage and properly recycled or disposed of by licensed handlers.

Operation. The proposed Energy Facility would generate approximately 50 tons per year of conventional solid waste consisting of office trash, packing materials, and nonrecyclables. Solid wastes generated during operation would be recycled as much as feasible. Recyclable materials would be separated from the solid waste stream. Solid waste would be stored in onsite roll-off bins. Solid waste would be collected periodically by a private contractor and hauled to a licensed disposal facility. The nearest licensed facility is the Klamath County Landfill~~,~~ located about 35 miles from the Energy Facility site. This landfill and the regional landfill, Roosevelt Regional Landfill in southern Washington, would accommodate solid waste generated by operation of the Energy Facility.

If onsite evaporation of the wastewater is selected as the preferred alternative, evaporation would leave a solid waste that would be occasionally removed for disposal in a licensed landfill. This non-hazardous solid waste is ~~a non-hazardous solid waste~~ composed of water-treatment chemicals and constituents concentrated from the raw water supply. Rabanco Companies confirmed that the Roosevelt Regional Landfill would accept and manage the sludge as ~~"~~"special waste,~~"~~ " meaning that a unique identification number would be created by the landfill operator to track the sludge from the Energy Facility.

2.3.2 Electric Transmission Line

The proposed COB Energy Facility would include construction of an approximate 7.2-mile, 500-kilovolt (kV), alternating current (AC) electric transmission line running south from the Energy Facility to an interconnection at BPA's Captain Jack Substation. Approximately 38 transmission towers would be required. The transmission towers would consist of steel lattice structures assembled in sections near the transmission tower site. Each transmission tower contains three components: the legs, body, and bridge. Typical transmission towers would range in height from 100 to 165 feet, with most towers in the 105- to 110-foot range. On average, the towers would be spaced approximately 990 feet apart, with a range from 380 to 1,500 feet.

Transmission towers would rest on four concrete footings, each about 4 feet in diameter. Allowing room for access and workspace around the footings would result in a permanent footprint disturbance of approximately 60 feet by 60 feet at each transmission tower~~,~~. At ~~and at~~ nine transmission tower locations, approximately 100 feet by 150 feet of additional, permanent space would be required to ensure safety for vehicles and equipment. Footings would be placed in holes that are excavated, augured, or blasted. The design of the footings would vary based on soil properties, bedrock depth, and the soundness of the bedrock at each transmission tower site. The final configuration of the new transmission line (for example, exact number of transmission towers, transmission tower heights, and location of transmission towers) would depend on final design and engineering and geotechnical considerations. Figure 2-4~~3~~ shows a typical transmission tower structure.

Typically, 500-kV, AC transmission lines require three sets of wires (or ~~"~~"conductors~~"~~ "). Each set is referred to as a phase~~,~~ and typically consists of a pair of bundled aluminum cables. One or two ~~"~~"shield wires~~"~~ " are placed near the top of the transmission structure~~,~~ above the conductors~~,~~ to shield the towers from lightning strikes.

An access road for travel by wheeled vehicles would be required for construction and to access the new electric transmission line for maintenance during operation. The access road

would be designed for use by cranes, excavators, supply trucks, boom trucks, and line trucks. The access road would be surfaced with gravel. Approximately 6.6 miles of new access road would be required. The access road would be approximately 15 feet wide, and grades would be less than 15 percent. No permanent access roads would be constructed in cultivated or fallow fields. Where temporary roads are used, any disturbed ground would be regraded to pre-construction contours, erosion control methods implemented, and revegetated~~repaired~~.

Based on review of a U.S. Geological Survey (USGS) quadrangle map and field work, only three intermittent creeks are present within the proposed electric transmission line corridor, and there are no visible perennial streams. Culverts that are properly sized and designed would be installed where the access road crosses intermittent creeks to facilitate flow of stormwater or snowmelt runoff and to minimize erosion.

Based on a planned, 154-foot-wide, electric transmission line easement, easement options have been obtained. Grading would occur within the easement at each transmission tower site and along the access road. The transmission tower sites may be graded to provide a relatively level work surface. During construction, staging areas would be needed where steel, spools of conductor, and other construction materials would be stored.

For safe and uninterrupted operation of the electric transmission line, vegetation would be cleared or trimmed. Clearing ~~may~~ might be by removal of vegetation or by controlling vegetation so that it does not grow above a certain height. Considerations that influence the amount and type of clearing include vegetation species, height and growth rates of vegetation, ground slope, wind and snow patterns, conductor elevation above ground, and clearance distance required between the conductors and other objects. Some form of clearing ~~may~~ might be required to the edge of the 154-foot-wide easement. Any leaning or diseased trees that could fall into the transmission line or pose a threat to reliable operation would be removed. At transmission tower sites, all trees, brush, stumps, and snags would be removed, including root systems. The amount of clearing required is unknown at this time.

After construction, vegetation control would be necessary, and would include controlling noxious weeds and managing growing vegetation in and adjacent to the easement. Vegetation control would consist of manual, mechanical, biological, and/or chemical methods. Mitigation measures are described in Section 3.4.2.

The project proponent would construct the electric transmission line to a final dead-end structure adjacent to the BPA Captain Jack Substation. BPA would be responsible for final interconnection with the substation. Interconnection work would include installation of bus work and bus ties, 500-kV breaker(s), isolation switches, and foundations; and extending the grounding system for the substation.

2.3.3 Natural Gas Pipeline

A new gas pipeline would be required to supply natural gas to the Energy Facility. ~~It~~ The pipeline would connect to an existing ~~PG&E~~ GTN gas transmission system line through a 4.1-mile-long, 20-inch-diameter natural gas pipeline constructed from the Bonanza Compressor Station along the ~~ROW~~right-of-way of existing Klamath County roads.

Metering facilities would be located at either the Energy Facility or the compressor station and not in the natural gas pipeline easement. The peak operating pressure of the ~~PG&E~~ GTN system at the Bonanza Compressor Station is 911 pounds per square inch, gauge (psig). No compression of natural gas would be required.

The natural gas pipeline would be installed in a 36-inch-wide trench at a depth of about 4 feet. The trench would be backfilled with pipe zone material and then with native soil up to the original grade.

Easement options have been obtained for a planned, 80-foot-wide easement needed for equipment staging and material laydown. The easement would be immediately adjacent to and along the Klamath County ~~ROW~~right-of-way for Harpold County Road No. 1097 and West Langell Valley Road No. 520. The route of the natural gas pipeline would cross the public roads in three places and an irrigation canal in one location. The crossings would be conventional bores underneath the public roads and an irrigation canal. The rest of the natural gas pipeline would be constructed by open trench methods.

In the areas where conventional bores would occur, additional temporary workspace would be required on both sides of the road or irrigation canal. Excavations would be larger than in the open trench sections to accommodate ~~(~~1) greater pipe depth, ~~(~~2) sharp angles at the crossings, and ~~(~~3) safe working conditions within the excavations. These excavations could be approximately 15 feet deep. The additional workspace would be necessary to excavate the deeper ditch in a safe manner and to store the additional excavated soil.

Additional temporary workspace of 40 feet (for a total of 120 feet) would be required along the north side of West Langell Valley Road near the Energy Facility site, where the natural gas pipeline route goes through an approximate 2,200-foot section of steep topography. The extra width would be needed for soil storage when leveling the easement to create a safe working platform for workers and equipment.

2.3.4 Water Supply Well System

Water would be needed by the Energy Facility for steam generation, demineralized water production, potable water and sanitary systems, and service water. Water also would be available for fire suppression. The source of water for construction and operation of the Energy Facility would be groundwater from a deep aquifer system intercepted by a well, known as the Babson well. No other deep aquifer system wells or water rights are known to exist in the Langell Valley area. A water supply system consisting of the Babson well and two additional water supply wells would be used to withdraw water from this deep zone aquifer.

Previous borehole geophysics and aquifer testing at the Babson well (CH2M HILL , 1994) indicated the presence of six groundwater-bearing zones within the upper 2,050 feet of the borehole. The project proponent proposes to use the three deep water-bearing zones that are present below a depth of 1,580 feet to supply water for the Energy Facility. These zones appear to be hydraulically separated from the shallow system by approximately 1,000 feet of non-water-bearing rock. The Babson well would be reconfigured, and the two additional water supply wells would be designed, to isolate the deep zone from the shallow zone system, and withdraw water only from the deep system. ~~.~~

Development of the Babson well would consist of installing a seal in the well from the surface to approximately 1,500 feet bgs. This seal would consist of a 10-inch or 12-inch welded steel casing grouted in place to seal off the shallow aquifer system. As a result, the well would no longer draw water from the shallow water-bearing zones. The additional water supply wells would be a maximum diameter of 12 inches and the depth of the additional water supply wells is expected to be approximately 2,000 feet. Like the Babson well, the additional water supply wells would be cased and grouted to seal off the shallow aquifer system from the deep system in the wellbore. The two additional water supply wells are necessary for back-up to ensure reliability of the water supply to the Energy Facility. The two additional water supply wells would be located in close proximity to the existing well.

An electrical pump with approximately 50 to 100 horsepower (hp) would be installed in each well. Because the deep aquifer system is under considerable confining pressure, the static water level in the wells would be approximately 20 feet bgs. Submersible pumps would be used. Surface features would include a pumphouse (approximately 20 feet by 30 feet with standard height walls) that would contain a heating, ventilation, and air conditioning (HVAC) system and lighting. On the discharge of the pump, a pump control valve would be needed for pump startup and shutdown procedures.

~~There is existing e~~Electrical service to the Babson well currently exists. However, this electrical service does not have sufficient capacity to accommodate the increased electrical load from the three, 50- to 100-hp pumps. The local power company, PacifiCorp, would be responsible for upgrading the electrical service to accommodate the increased electrical load. Emergency back-up power to the pump would be provided by an onsite diesel generator. The generator would be located near the pumphouses but in a separate walk-in, weatherproof enclosure. The diesel fuel would be stored in an aboveground storage tank located within a secondary containment structure.

Water from the water supply well system would be pumped through a 2.8-mile, 6-inch-diameter water supply pipeline to a 3~~.0~~-MG water storage tank located at the Energy Facility.

The water supply pipeline would be constructed within a 60-foot-wide easement on land under ownership options by the project proponent, except for portions of the route that cross Klamath County roads. The route of the water supply pipeline would cross two Klamath County roads: East Langell Valley Road and Teare County Road 1161. In addition, the water supply pipeline would cross an irrigation ditch operated by the Langell Valley Irrigation District in three locations. The crossings would be directionally bored underneath the public roads and irrigation ditch. The rest of the water supply pipelines would be constructed by open trench methods.

In the areas where conventional bores would occur, additional temporary workspace would be required on both sides of the road or irrigation canal. Excavations would be larger than in the open trench sections to provide room for workers to safely work down in the excavations. The excavations would be approximately 15 feet deep. The additional workspace would be necessary to excavate a safe ditch and store the excavated soil.

A temporary access road for travel by wheeled vehicles would be required for construction. The access road would be designed for use by cranes, excavators, supply trucks, boom

trucks, and line trucks. The access road would be removed and revegetated after construction of the water supply pipeline.

The water supply pipeline would be installed in a 36-inch-wide trench at a depth of about 4 feet. The trench would be backfilled with pipe zone material and then with native soil up to the original grade. Figure 2-54 shows a typical section of the water supply pipelines.

2.3.5 Construction Schedule and Activities

Based on conditions of the electric power market after approval of the SCA, the project proponent may decide to construct the Facility in one phase or two phases. If the Facility is constructed in two phases, construction of the second phase may start up to 2 years after the first phase starts commercial operation.

If the Facility is constructed in one phase, construction is expected to take 23 months. If the Facility is constructed in two phases, the first phase of construction is expected to take approximately 18 months.

Because the conditions of the power market are volatile, the project proponent may choose not to start construction of the Facility until 3 years after the SCA is approved.

For the single-phase construction, the construction workforce is expected to average 352 employees, with a low of 147 during the first 2 months and final 4 months of construction, and a peak of 543 during the fifteenth and sixteenth months of construction.

Equipment used at the site would include light and heavy trucks, backhoes, bulldozers, graders, cranes, air compressors, welding machines, and power hand tools. Foundation piling equipment may also be used. Some specialized boring equipment would be used to install the pipeline under existing roads and irrigation canals.

~~Other Projects Potentially Contributing to Cumulative Impacts~~

~~The level of analysis of cumulative impacts is commensurate with the potential for impacts, resources affected, scale of the impact, and other factors. This treatment of cumulative impacts is consistent with the EPA guidance for determining cumulative impacts (*Consideration of Cumulative Impacts in EPA Review of NEPA Documents*, 1999)~~

~~Other Energy Projects~~

~~There are two other potential energy generation projects near the Energy Facility site: the Klamath County water power project and the Klamath Generating Facility. The Klamath County water power project is proposed to be sited to the southeast of the COB Energy Facility. The Klamath Generating Facility is proposed to be sited about 3 miles south of Klamath Falls, Oregon, adjacent to the existing Klamath Cogeneration Project.~~

~~The Klamath County water power project would be a "closed system" pumped storage project with manmade upper and lower reservoirs. The eventual construction of the water power project is uncertain at this time given its preliminary nature. Energy Recycling Company has submitted an application to the Federal Energy Regulatory Commission for a preliminary permit to secure a license for the Klamath County water power project under~~

~~Part I of the Federal Power Act. Energy Recycling Company has previously held a permit for the project, and the project proponent worked on a similar project at the site from 1991 to 1998 (the Lorella Pumped Storage Project). Despite presentations to potential development groups, the Lorella Pumped Storage Project never progressed to the development stage, and it is not certain that its predecessor, the Klamath County water power project, will do so, either.~~

~~Furthermore, according to the application, water for the Klamath County water power project may be obtained from nearby groundwater sources or the proposed Energy Facility. It is unlikely that the water power project will obtain water from local groundwater sources for the following reasons:~~

- ~~The shallow aquifer system (above approximately 500 feet) is a heavily appropriated basalt aquifer that is in varying degrees of hydraulic connection with the Lost River.~~
- ~~The state of Oregon is currently adjudicating Klamath River Basin water rights for those with claims dating prior to 1909.~~

~~Because the project has been through various stages of conceptual development and permitting for 12 years and obstacles remain, the Klamath County water power project has not been considered in the discussion of cumulative impacts as a reasonably foreseeable future action.~~

~~The COB Energy Facility would use water from the deep aquifer system pumped through the Babson well, rather than from shallow groundwater sources. (On April 24, 2002, the project proponent submitted a water right application to the Oregon Water Resources Department [OWRD] and on April 22, 2003, OWRD issued a proposed final order [PFO] that included a draft water right permit.) No other Langell Valley area wells or water rights in the deep aquifer system are known to exist.~~

~~Klamath Generation, LLC, a wholly owned subsidiary of PacifiCorp Power Marketing, Inc., submitted an application for a site certificate on December 26, 2001. The project is called the Klamath Generating Facility and if constructed would be a 542.2-MW natural gas combined-cycle system (two gas combustion turbine generators and one or two steam turbine generators) with power augmentation. The proposed facility would be located about 3 miles south of Klamath Falls, Oregon. The proposed site is adjacent to the existing Klamath Cogeneration Project. On April 23, 2002, the applicant withdrew its request for expedited review. ODOE is continuing to review the application under the standard review process.~~

~~The Klamath Generating Facility has been considered in the discussion of cumulative impacts on air quality.~~

~~Other Recent or Proposed Projects~~

~~Other recent projects or proposed projects that have been identified in the vicinity of the Energy Facility include the following:~~

~~Lane/Klamath Fiber Consortium: This project involves the acquisition of the fiber optics system between Springfield, Oregon, and Merrill, Oregon. Only a small portion of the project lies in the vicinity of the proposed project. Because this project is currently constructed in existing~~

~~rights-of-way and construction impacts have been mitigated, there are no past, present, or future environmental impacts contributing to cumulative impacts.~~

~~Sykes Telecommunication: This project involved the construction of a new 400-employee call center in Klamath Falls, Oregon. The project has been completed. Agricultural land and natural habitat have not been affected. No water discharges to surface or groundwater have occurred, and there are no air emissions related to the project. The project does create additional cumulative traffic on regional roads. Based on the nature of the project and its relative distance from the proposed Energy Facility, there are no significant cumulative impacts related to the proposed Energy Facility.~~

~~Escend Technologies: Escend Technologies designs business-to-business software. Escend opened an office in Klamath Falls in 2000, employing approximately 60 people. The firm estimates that it will grow to 200 employees by 2005. Existing facilities are located in the urban area and do not affect similar types of land and habitats impacted by the proposed Energy Facility. Escend uses city services for water, wastewater, and solid waste. The facility does not have air emissions. Future impacts on regional traffic may occur with increased employment, but these impacts are expected to be spread around the region. Such impacts are not expected to contribute substantially to cumulative traffic impacts in the vicinity of the proposed Energy Facility.~~

~~Thermo Pressed Laminates: This manufacturing facility produces laminate materials for furniture, cabinets, and other uses. The facility was constructed in Klamath Falls in 2002 at an existing industrial site. Water supply, wastewater, and solid waste services are provided through the city of Klamath Falls. The facility has minor air emissions and does not have an air permit. Emissions from this facility would be represented by background.~~

~~Electro Scientific Industries: Electro Scientific Industries makes capital equipment for the semiconductor and electronics components industries. In 2001, the firm opened a manufacturing facility in Klamath Falls. An additional 200 jobs are anticipated by 2006. Except for air emissions, this facility is beyond the resource impact area identified for cumulative impacts. The facility has minor emissions and does not have an air permit. Emissions from this facility would be represented by background.~~

~~Other types of development that potentially could contribute to cumulative impacts include agricultural development, road construction, and land development. Agricultural development historically has impacted the area more than other land uses. The Energy Facility, through land application of the wastewater, would contribute minor cumulative impacts to the present and potential future agricultural development in the area. There are no planned or known road construction projects or land development projects proposed for the project area.~~

2.4 No Action Alternative

In the No Action Alternative, BPA would decide not to provide the requested connection to the regional power grid, or BLM would decide not to provide an easement for construction of an electric transmission line across Federal lands. Without these approvals, the proposed Energy Facility would not be feasible. Thus, in the No Action Alternative, the proposed Energy Facility would not be built.

2.5 Other Alternatives

2.5.1 Alternative Strategies for Electrical Supply and Demand Management

In the early 1990s, BPA prepared a number of NEPA documents that analyzed the environmental effects of various alternative policies and business strategies. In 1993, BPA published a document titled *Resource Program Final Environmental Impact Statement* (DOE/EIS-0162). This EIS included a detailed analysis of the environmental consequences of alternative strategies for managing demand and increasing the supply of electrical energy in the Pacific Northwest. Alternatives analyzed consisted of various combinations of conservation, development of renewable resources (including hydropower, geothermal, wind and solar power), efficiency improvements, cogeneration, combustion turbines, nuclear power, and coal.

In the mid-1990s, responding to changes in the electric utility market, BPA modified its business plan and prepared a document titled *Business Plan Final Environmental Impact Statement* (DOE/EIS-0183). It was published in June 1995 and incorporated a number of earlier NEPA documents by reference, including the *Resource Program Final Environmental Impact Statement*.

The *Business Plan Final Environmental Impact Statement* included a description of how it would be used in BPA's decision-making process, as follows:

> "This BPA EIS is a programmatic EIS: that is, it addresses 'umbrella' policies and concepts. Approaches, strategies, and general agency direction—not site-specific actions—are recommended here. As the Administrator implements his broader policies and business strategies, other more specific business decisions such as the development of individual energy generation resources and transmission facilities will have their own environmental review and decision processes. These additional environmental reviews will look at site-specific actions, using the information and decisions in this EIS as a base to understand how they fit into more global policies and business strategies. This process is called 'tiering,' where more specific additional information on potential environmental consequences adds to the understanding for subsequent decisions." "

The purpose of tiering is to promote orderly and properly sequenced decision-making for complex, multistage projects that may have adverse effects on the environment. ~~It~~ Tiering also avoids unnecessary and duplicative technical analysis. Broad policies and strategies are first examined in a programmatic EIS. The site-specific impacts of an individual project that is needed to implement the larger policy or strategy are then examined in a site-specific EIS. The analysis of the broad political and strategic alternatives is included in the site-specific EIS by reference and does not need to be repeated.

Consistent with this approach, this EIS for the COB Energy Facility confines itself to analysis of the site-specific environmental impacts of the proposed action. The analyses of larger policy and strategy alternatives are contained in the programmatic Business Plan EIS and Resource Program EIS and are included here by reference.

2.5.2 Alternative Considered But Eliminated from Detailed Analysis

The project proponent considered various alternatives before developing the proposed Energy Facility. Numerous locations in Washington and Oregon were considered based on the site selection criteria described in Section 2, and were also evaluated to determine whether the sites met the project proponent's purpose and need for the Facility (see Section 1.2). Information concerning the alternative sites is shown on Table 2-2. Table 2-2 provides a comparative analysis summarizing why these sites were eliminated from detailed analysis and consideration and why the Klamath location was pursued. Figure 2-3 shows the alternative locations for potential development areas.

Based on the comparative consideration of these other potential sites, the Bonanza, Oregon, vicinity clearly best met the project proponent's purpose and need for the energy generation facility, and also best satisfied the site selection criteria. Once the area near Bonanza was selected, minimization of impacts to the environment and residents were the most important criteria used in the company's evaluation of alternative sites and the development of proposed Energy Facility features. The proposed Energy Facility site was chosen because it is close to an existing natural gas pipeline and an existing electric transmission line, and thus would minimize the need for construction of new gas and electrical transmission facilities. This offers both economic and environmental advantages.

Alternative transmission corridors were evaluated for the natural gas pipeline, the water supply pipeline, and the electric transmission line. Alternative wastewater discharge scenarios and cooling also were considered. The following sections describe the alternatives considered for these facilities and the reasons the alternatives were eliminated from detailed analysis.

2.5.2.1 Alternative Energy Facility Sites in the Vicinity of Bonanza, Oregon

A location closer to the Captain Jack substation, and near Malin, Oregon, could reduce the distance needed for a new electric transmission facility. However, compared to other locations in the Bonanza, Oregon, vicinity that are in closer proximity to the Captain Jack substation, the location of the proposed COB Energy Facility minimizes the visual resource impacts. The proposed Energy Facility is located in a small valley where the numbers of residences who would have unobstructed views of the project are very small (fewer than 3). The closest resident with an unobstructed view of the Facility is located over a mile from the project structures, and features of the structures would be seen in the middle-ground of the view. The proposed project site is located next to, and would be visible from, West Langell Valley Road. However, the traffic volume on this road averages no more than 400 vehicles per day (see Section 3.6), and according to local residents, much of this traffic is related to local agricultural activities; in addition, the 400 vehicle trips per day is considered to be a high estimate. Because the 7.2-mile-long electric transmission line required to connect a power plant at the proposed site with the Captain Jack Substation would be routed through an upland area where there are relatively few viewers and where BLM lands have a Class IV Visual Resource Inventory rating, the potential for the line to have visual effects of serious concern is low.

If a project site were to be located in an area nearer to and north of the Captain Jack Substation, it would most likely need to be located somewhere in the upland area where the proposed route of the electric transmission line is located (see Figure 2-2). Project sites in

this area would be close or immediately adjacent to areas of bald eagle activity and habitat (see Section 3.4 and Appendix C), areas of previously identified cultural sites, immediately adjacent to critical deer winter range, and close to the Bryant Mountain Proposed Trail and primitive camping areas managed by the BLM (see Figure 3.8-1). In addition, existing road access to this upland area is by narrow, unpaved dirt roads. These roads are used by the handful of residents who live in the upland area; the roads would need to be widened to accommodate the hauling of heavy equipment and materials for construction. The initial section of the existing road off of West Langell Valley (approximately 4,000 feet) has steep grade as it traverses up the north end of Bryant Mountain and would be particularly difficult to widen.

If a project site were to be located in an area nearer to and south of the Captain Jack Substation, it would most likely need to be located somewhere in the area of flat plain lands that lie between the community of Malin or the hills that border the plain to the north (see Figure 2-6). This area is devoted to intensive agricultural production and is an open landscape with few trees and with many farm residences located at regular intervals along the network of rural roads that follow the section and quarter section lines. The only screening of views across this plain is provided by Turkey Hill, a narrow, 1-mile-long ridge that rises from the plain in the area just to the north of the community of Malin. Unless a project site were to be located in the area to the due north of Turkey Hill, a power plant facility located on this plain would be highly visible from the community of Malin. Given the pattern of farm residences that are regularly spaced along the roads in this area, a power plant located on any project site in this area would inevitably be visible from a half dozen or more residences located a half a mile or closer to the site, and would be visible in the middle-ground from an even larger number of homes. In addition to being visible from nearby homes and the community of Malin, a power plant built on a site in this area would also be visible across the flat, open agricultural lands from Highway 50, a regionally important connector that carries 1,500 vehicles per day.

In addition to comparatively greater visual impacts upon residents in the Malin vicinity, the area near Malin would be approximately 8 to 10 miles closer to the following scenic or aesthetic resources described in Section 3.8: Lava Beds National Monument, Bloody Point, Battle of Scorpion Point, the Petroglyths, and Tulelake National Refuge. Consequently, while closer to the Captain Jack substation, a location in the Malin vicinity would have a significantly greater impact upon recognized scenic and aesthetic resources, as well as greater potential impacts on recreational users.

The electric transmission line that would be required to link a power plant on a site in the Malin vicinity area with the Captain Jack substation would have a high probability of passing in close proximity to some of the residences in the area. The segment of the transmission line that would traverse the hills that define the northern edge of the plain has the potential to be highly visible from the residences and roads on the plain below because clearing of the right of way would create a contrasting corridor on the hillside and the potential of some of the towers to be skylined at the top of the ridge. Due to these significant unavoidable impacts, as well as other limitations and impacts identified in Table 2-2, a site in the vicinity of Malin, Oregon, was eliminated from further detailed analysis and consideration.

2.5.2.2 Alternative Natural Gas Pipeline

The alternative natural gas pipeline route would have been a more direct, 3.8-mile route from the Bonanza Compressor Station to the Energy Facility. This alternative route would have been located away from the public road ~~ROW~~ right of way and ~~run~~ traverse over two mountains between the compressor station and the Energy Facility site.

The majority of the land along the alternative natural gas pipeline would have been zoned Forestry Range (lands of mixed farm and forestry uses), with some Exclusive Farm Use–Cropland (EFU-C) and EFU–Cropland/Grazing (EFU-CG), and a very small area of Industrial Land at the compressor station. Land uses observed along the alternative natural gas pipeline route included irrigated pasture, a dairy, industrial land (the compressor station), open rangeland/woodlands managed by BLM and private landowners, and dryland farming and cattle grazing on a fallow field.

Even though the alternative natural gas pipeline route would have been slightly shorter than the proposed route (3.8 miles versus 4.1 miles), the alternative was eliminated from further consideration because construction would have taken place on steep slopes, increasing the likelihood of erosion, disturbance, and the potential risk of damage from landslides or sloughing. The route would also have crossed an ancient landslide, which would pose risk to the safe operation of the high-pressure natural gas pipeline.

The proposed route would not face the same disadvantages as the alternative route. Furthermore, the proposed alternative would not impact the operation of the irrigation canals during its construction or operation. No cultural resource sites, wetlands, or sensitive plants were identified during field studies.

2.5.2.3 Alternative Water Supply Pipeline

The project proponent chose to obtain water supply for the Energy Facility from the deep aquifer accessible from the Babson well. Because virtually all existing water supply in the Klamath Basin is from the shallow aquifer or surface sources, this approach minimized environmental impacts on water resources in the region by making use of this little-utilized source.

The 8~~.0~~-mile alternative water supply pipeline route from the Babson well to the Energy Facility site would have been substantially longer than the proposed route. The alternative route would have been located along the public road ~~ROW~~right-of-way. This route would have originated at the water supply well system, traveled southeast along East Langell Valley Road, and then along several other public road rights-of-way~~ROWs~~ to West Langell Valley Road, continuing northwest to the raw-~~-~~water supply storage tank at the Energy Facility site.

Zoning along the route of the alternative water supply pipeline is EFU-CG, EFU-C, and FR. The majority of the land use along the alternative water supply pipeline route is irrigated pasture, with a small amount of juniper woodland, sagebrush scrub, and Ponderosa pine habitats. Numerous wetland resources occur along this route, including two high-quality cattail marshes. Many of the remaining wetlands are excavated channels located within a relict lake bed. These wetland areas are mapped on the National Wetland Inventory (NWI) as palustrine emergent wetlands.

The alternative water supply pipeline was eliminated from further consideration because (1) the alternative route is not direct and is 5.2 miles longer than the preferred route, (2) the alternative route would have greater wetland impacts and mitigation requirements, (3) impacts to local traffic would be significantly greater because the alternative route uses the public road ROWright-of-way for almost the entire route, and (4) the presence of irrigation canals that parallel the roads for hundreds of feet would be expected to prevent the use of the public ROWright-of-way for staging and construction activities.

2.5.2.4 Alternative Electric Transmission Line

Alternatives for interconnecting the proposed project to the regional transmission system are limited because of the location of the proposed project's location project in a remote area with few existing high-voltage lines. However, three alternatives were considered for connecting the Energy Facility with the regional power grid:

(1) tThe preferred 7.2-mile electric transmission line from the Energy Facility to the BPA Captain Jack Substation.

(2) aAn alternative, 7.9-mile electric transmission line that also connects the Energy Facility with the BPA Captain Jack Substation, but runs parallel to the existing Pacific Northwest/Pacific Southwest (PNW/PSW) intertie transmission lines, and.

(3) eConnecting to the regional power grid by tying directly into the existing PNW/PSW intertie transmission lines that transect the Energy Facility site.

The third alternative would not require an electric transmission line. This alternative was eliminated because BPA, PGE, and PacifiCorp prohibit direct connection of new generation to the PNW/PSW intertie for protection of system reliability. As a result, this alternative was ruled out immediately ruled out and no further analysis conducted.

The second alternative for the electric transmission line presented technical, economic, and resource concerns greater than those presented by the preferred alternative. The rejected electric transmission line alternative is known as the "ROWright-of-way alternative" in reference to facility locations proposed along existing transmission line rights-of-way. The ROWright-of-way alternative would have required building a new electric transmission line from the Energy Facility to the Captain Jack Substation within a separate 200-foot-wide easement, necessitating property acquisition. The easement would have been 7.9 miles long and run parallel and adjacent to the existing electric transmission ROWright-of-way corridor and 250 feet from the existing BPA/PGE/PacifiCorp electric transmission lines (three transmission lines collectively known as the PNW/PSW Intertie).

A comparison of the ROWright-of-way alternative and the preferred electric transmission line route is presented in Table 2-32 of this chapter.

The ROWright-of-way alternative would cover a larger area than the preferred alternative. The rejected alternative would be 7.9 miles long and would require 44 towers as compared to 7.2 miles and 38 towers for the preferred route. The rejected alternative would have a 200-foot easement that would cover almost 190.8 acres, while the preferred route would have a 154-foot-wide easement that would cover approximately 134.0 acres. The additional corridor width for the alternative transmission line is for extra workspace required for adequate separation from the existing transmission line. The ROWright-of-way alternative would

require 52 acres of BLM-~~owned~~ managed land, while the preferred route would require 44 acres of BLM-~~owned~~ managed land.

Zoning along the route of the alternative electric transmission line is EFU, FR, and F. Land uses observed along the alternative electric transmission line route include existing electric transmission lines, fallow agricultural fields used for cattle grazing, ~~residents~~residences, a lake, selective historical timber harvesting of ponderosa pine woodland, open rangeland/ woodlands managed by Federal and private landowners, and the ~~PG&E~~ GTN interstate gas pipeline system.

A cluster of residences are located in the upper half of the route. These residences are approximately 400 feet from the westernmost existing transmission line. Electric and magnetic fields (EMFs) would increase for the residences along the alternative transmission line. If the alternative transmission line were to be constructed, these residences would only be approximately 200 feet from the centerline of the transmission line, or approximately 100 feet from the edge of the 200-foot easement. In addition, visibility impacts would occur at residential locations as a result of clearing trees and vegetation to within 100 feet (the edge of the 200-foot easement described above) of the residences.

During field surveys of the ~~ROW~~right-of-way alternative, three cultural resource sites were identified. The amended National Historic Preservation Act (NHPA) of 1966 established a Federal policy of avoiding or minimizing adverse effects to cultural resources when planning and constructing ~~f~~Federally involved projects. As such, the proposed electric transmission line has been moved to avoid these resources.

During field surveys in June and July 2002, several bald eagles were observed foraging along the alternative electric transmission line easement. There is a resident population of bald eagles at McFall Reservoir approximately 1,750 feet west of the alternative electric transmission line route.

BPA wants to maintain the flexibility to construct a fourth transmission line adjacent to the three existing lines, and the project proponent's ~~ROW~~right-of-way electric transmission line alternative would not be consistent with that objective. In addition, BPA has raised technical concerns about the feasibility of another electric transmission line adjacent to the existing electric transmission lines.

2.5.2.5 Alternative Cooling Scenario

The project proponent considered water cooling for the Energy Facility. Peak water demand for water cooling would be approximately 7,590 ~~gallons per minute (~~gpm~~)~~ (10.9 million gallons per day [gpd]). Average annual water demand would be approximately 5,390 gpm (7.6 million gpd). These values include 90 gpm for seasonal irrigation. A draft water right permit was issued by Oregon Water Resources Department (OWRD) in a proposed final order (PFO) dated April 22, 2003. This draft water right allowed water withdrawal from the deep zone aquifer at a rate up to 7,500 gpm for industrial uses and 90 gpm for seasonal irrigation use.

Subsequently, the project proponent decided to switch to air cooling from wet cooling in response to feedback from the community. Amendment No. 1 to the SCA was filed with EFSC on July 25, 2003, to switch to air cooling.

On August 19, 2003, OWRD provided ODOE with a revised recommendation and draft water right permit reflecting a reduction in the industrial water requirement to a maximum instantaneous rate of 210 gpm. The 90 gpm for seasonal irrigation use remained unchanged.

2.5.2.6 Stormwater Discharge to County Road Ditch

An alternative to manage stormwater that falls inside the fenceline of the Energy Facility was considered in the DEIS. This alternative was referred to as the second alternative in the DEIS. That second alternative would route stormwater from the stormwater pond to a ditch adjacent to the Energy Facility access road into the West Langell Valley Roadside ditch, where it would eventually enter the High Line Levee Ditch and then the Lost River. This second alternative is no longer under consideration.

2.5.2.7 Temporary Storage and Hauling Process Wastewater to WWTP

Three alternatives were considered in the DEIS for management of process wastewater. The third alternative described in the DEIS would manage of process wastewater by temporarily storing onsite and hauling to a WWTP for offsite disposal. The project proponent has contacted the two municipal WWTPs in Klamath Falls—the South Suburban Sanitary District and the City of Klamath Falls Sanitary District. According to managers at both facilities, each would be required to evaluate whether they can meet the EPA categorical standard to accept industrial waste or whether local ordinance provides for acceptance of truck-hauled wastewater. Neither of these WWTPs is presently permitted to accept trucked wastes. Therefore, this third alternative is no longer under consideration.

2.6 Other Projects Potentially Contributing to Cumulative Impacts

The level of analysis of cumulative impacts is commensurate with the potential for impacts, resources affected, scale of the impact, and other factors. This treatment of cumulative impacts is consistent with the EPA guidance for determining cumulative impacts (*Consideration of Cumulative Impacts in EPA Review of NEPA Documents*, 1999).

2.6.1 Other Energy Projects

There are three~~wo~~ other potential energy generation projects near the Energy Facility site: the Klamath County water power project, ~~and~~ the Klamath Generating Facility, and a wind project on Bryant Mountain. The Klamath County water power project is proposed to be sited to the southeast of the COB Energy Facility. The Klamath Generating Facility is proposed to be sited about 3 miles south of Klamath Falls, Oregon, adjacent to the existing Klamath Cogeneration Project. There is no specific public information on ~~where~~ the wind project on Bryant Mountain.

The Klamath County water power project would be a "closed system" pumped storage project with manmade upper and lower reservoirs. The eventual construction of the water power project is uncertain at this time given its preliminary nature. Energy Recycling Company has submitted an application to the Federal Energy Regulatory Commission for a preliminary permit to secure a license for the Klamath County water power project under Part I of the Federal Power Act. Energy Recycling Company has previously held a permit

for the project, and the project proponent worked on a similar project at the site from 1991 to 1998 (the Lorella Pumped Storage Project). Despite presentations to potential development groups, the Lorella Pumped Storage Project never progressed to the development stage, and it is not certain that its predecessor, the Klamath County water power project, will do so either.

Furthermore, according to the application, water for the Klamath County water power project may be obtained from nearby groundwater sources or the proposed Energy Facility. It is unlikely that the water power project will obtain water from local groundwater sources for the following reasons:

- The shallow aquifer system (above approximately 500 feet) is a heavily appropriated basalt aquifer that is in varying degrees of hydraulic connection with the Lost River.
- The state of Oregon is currently adjudicating Klamath River Basin water rights for those with claims dating prior to 1909.

Because the project has been through various stages of conceptual development and permitting for 12 years and obstacles remain, the Klamath County water power project has not been considered in the discussion of cumulative impacts as a reasonably foreseeable future action.

The COB Energy Facility would use water from the deep aquifer system pumped through the Babson well, rather than from shallow groundwater sources. (On April 24, 2002, the project proponent submitted a water right application to OWRD and on April 22, 2003, OWRD issued a proposed final order [PFO] that included a draft water right permit.) No other Langell Valley area wells or water rights in the deep aquifer system are known to exist.~~[[mention worst-case study here]]~~ (see the worst case analysis of water impacts in Appendix F to the Biological Assessment [which is Appendix C to this FEIS]).

Klamath Generation, LLC, a wholly owned subsidiary of PacifiCorp Power Marketing, Inc., submitted an application for a site certificate on December 26, 2001. The project is called the Klamath Generating Facility and if constructed would be a 542.2-MW natural gas combined-cycle system (two gas combustion turbine generators and one or two steam turbine generators) with power augmentation. The proposed ~~facility~~Facility would be located about 3 miles south of Klamath Falls, Oregon. The proposed site is adjacent to the existing Klamath Cogeneration Project. On April 23, 2002, the Applicant withdrew its request for expedited review. ODOE is continuing to review the application under the standard review process.

The Klamath Generating Facility has been considered in the discussion of cumulative impacts on air quality.

There has been some reports of a possible wind project on Bryant Mountain. To date no formal applications for such a project have been filed with a public agency. Meteorological test towers have been erected to evaluate wind speed in different seasons, but it is not currently known if it is a viable wind location. Without more detail, it is unknown whether a wind project is viable and involve one wind turbine, ten or one hundred, or what ancillary facilities would be required. This project is not a reasonably foreseeable future private or federal action and is not appropriately included in the cumulative impacts analysis.

~~2.1.2~~2.6.2 Other Recent or Proposed Projects

Other recent projects or proposed projects that have been identified in the vicinity of the Energy Facility include the following:

Lane/Klamath Fiber Consortium: This project involves the acquisition of the fiber optics system between Springfield, Oregon, and Merrill, Oregon. Only a small portion of the project lies in the vicinity of the proposed project. Because this project is currently constructed in existing rights-of-way and construction impacts have been mitigated, there are no past, present, or future environmental impacts contributing to cumulative impacts.

Sykes Telecommunication: This project involved the construction of a new, 400-employee call center in Klamath Falls, Oregon. The project has been completed. Agricultural land and natural habitat have not been affected. No water discharges to surface or groundwater have occurred, and there are no air emissions related to the project. The project does create additional cumulative traffic on regional roads. Based on the nature of the project and its relative distance from the proposed Energy Facility, there are no significant cumulative impacts related to the proposed Energy Facility.

Escend Technologies: Escend Technologies designs business-to-business software. Escend opened an office in Klamath Falls in 2000, employing approximately 60 people. The firm estimates that it will grow to 200 employees by 2005. Existing facilities are located in the urban area and do not affect similar types of land and habitats impacted by the proposed Energy Facility. Escend uses city services for water, wastewater, and solid waste. The ~~facility~~Facility does not have air emissions. Future impacts on regional traffic may occur with increased employment, but these impacts are expected to be spread around the region. Such impacts are not expected to contribute substantially to cumulative traffic impacts in the vicinity of the proposed Energy Facility.

Thermo Pressed Laminates: This manufacturing facility produces laminate materials for furniture, cabinets, and other uses. The facility was constructed in Klamath Falls in 2002 at an existing industrial site. Water supply, wastewater, and solid waste services are provided through the city of Klamath Falls. The facility has minor air emissions and does not have an air permit. Emissions from this facility would be represented by background.

Electro Scientific Industries: Electro Scientific Industries makes capital equipment for the semiconductor and electronics components industries. In 2001, the firm opened a manufacturing facility in Klamath Falls. An additional 200 jobs are anticipated by 2006. Except for air emissions, this facility is beyond the resource impact area identified for cumulative impacts. The facility has minor emissions and does not have an air permit. Emissions from this facility would be represented by background.

Other types of development that potentially could contribute to cumulative impacts include agricultural development, road construction, and land development. Agricultural development historically has impacted the area more than other land uses. The Energy Facility, through land application of the wastewater, would contribute minor cumulative impacts to the present and potential future agricultural development in the area. There are no planned or known road construction projects or land development projects proposed for the project area.