Final Environmental Impact Statement

(DOE/eis-0194)

Responsible Agency: U.S. Department of Energy, Bonneville Power Administration (BPA)
Title of Proposed Action: Tenaska Washington II Generation Project
State Involved: Washington

Abstract: BPA is considering whether to purchase electrical power from a proposed privately-owned combustion-turbine electrical generation plant in Washington. The plant would be fired by natural gas and would use combined-cycle technology to generate 240 average megawatts (aMW) of energy. The plant would be developed, owned, and operated by Tenaska Washington Partners II, L.P. The project would be located about 19 kilometers (12 miles) southeast of downtown Tacoma in the Frederickson Industrial Area, Pierce County. The proposed plant would occupy about half of a 6.4-hectare (16-acre) parcel and would be consistent with the industrial character of its surroundings. The proposed site is currently undeveloped and zoned for industrial use by the county.

Main environmental concerns identified in the scoping process and in comments on the Draft Environmental Impact Statement (eis) include: (1) potential air quality impacts, such as emissions and their contribution to the "greenhouse" effect; (2) potential health and safety impacts, such as nuisance odors, plant safety, visibility and heat-emission systems which may affect low-flying planes and potential health effects of electric and magnetic fields; and (3) potential water quality and quantity impacts, such as the amount of wastewater to be discharged, the source and amount of water required for plant operation. These and other issues are discussed in detail in the eis.

The proposed project already includes many features designed to reduce environmental impacts. Based on investigations performed for the eis, no significant unavoidable adverse environmental impacts associated with the proposed project were identified, and no evidence emerged to suggest that the proposed action is controversial.

The eis is being mailed to numerous agencies, groups, and individuals (see Section 8.0). There will be a 30-day no-action period before any decisions are made and the Record of Decision is signed.

To request additional copies of the Summary eis or the complete eis (2 Volumes) please contact:
Bonneville Power Administration
Public Involvement Manager
P.O. Box 12999
Portland, Oregon 97212

For additional information on the eis please contact:
Bonneville Power Administration
Environmental Coordinator
Office of Energy Resources - RAE
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Copies may also be obtained by calling BPA's toll free document request line:
1-800-622-4520

For information on DOE NEPA activities contact: Carol M. Borgstrom, Director, Office of NEPA Oversight, EH-25, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, D.C. 20585, (800) 472-2756.

VOLUME I: Environmental Analysis and Technical Appendices

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 NEED

BPA has statutory responsibilities to supply electrical power to its utility, industrial, and other customers in the Pacific Northwest. As BPA embarked on the competitive acquisition process for additional conservation and generation resources, an underlying need for acquisition of new resources was to avoid electricity deficits caused by growing customer loads. In the time period since the Deis was issued for comment, BPA has become involved in a major effort to reassess its role and need for resources through the Competitiveness Project. That process is still very much in a developmental stage; however, it has provided preliminary indications that BPA's load growth may not be as great as was predicted in the 1990 and 1992 Resource Programs. BPA has examined the Tenaska Washington II project in light of these tentative conclusions and finds that even if their preliminary projections become reality, the Tenaska Washington II project is still needed and justified. It meets a number of system requirements. Most important among these is to firm non-firm hydroelectric power so that it can be sold at higher value firm power. It also helps with power system stability problems associated with voltage collapse in the Puget Sound area (Puget Sound Area Electric Reliability Plan Final eis, 1992).

1.2 PURPOSE

BPA's purpose for this action is to:

- Meet contractual obligations to supply requested, cost-effective electric power to BPA customers, having considered potential environmental impacts and mitigation measures in its decisions;
- Assure consistency with BPA's statutory responsibilities, including the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act), which requires consideration of the Pacific Northwest Power Planning Council's (Council) Conservation and Electric Power Plan and Fish and Wildlife Program; and
- Develop a competitive, long-term resource acquisition program based on experience gained from the pilot acquisition program that led to the Tenaska Washington II proposal.

1.3 THE PROPOSED ACTION

The proposed action is the purchase by BPA of electrical power which will be generated at a privately-owned gas-fired combustion turbine (CT) plant in Pierce County, Washington. The proposed Tenaska Washington II project would generate 240 aMW of electrical energy and would be built and operated by Tenaska Washington Partners II, L.P. (Tenaska), a developer of generation resources. Electricity generated at the proposed power plant would be supplied to BPA's South Tacoma facility for distribution through the regional power grid.





2.0 BACKGROUND

2.1 THE ROLE OF BPA

BPA is a Federal power marketing agency within the Department of Energy. Its service area is the Pacific Northwest, including Oregon, Washington, Idaho, and Western Montana. BPA was established in 1937 to sell and transmit electrical power produced at Bonneville Dam on the Columbia River. As more Federal hydropower projects were built on the Columbia and elsewhere in the Pacific Northwest, BPA's responsibility for power marketing and transmission increased. Today BPA markets power from 31 hydropower projects, owned and operated by the Federal government, and from one nuclear power plant. Almost half the electrical power used in the Pacific Northwest comes from BPA.

In 1980, the Northwest Power Act (Pub.L. No. 96-501) was enacted, expanding BPA's authority and responsibilities. Under this Act, BPA is authorized to purchase power from new sources and integrate them into the existing system. At the same time the Northwest Power Act directs BPA to meet the future power needs of its utility customers. The Northwest Power Act also created the Council and directed it to prepare a regional power plan. The regional power plan provides the long-range context within which BPA's own planning takes place.

2.2 BPA'S RESOURCE PLANNING PROCESS

Every two years, BPA develops a resource program that explains how BPA proposes to meet its expected load obligations. The resource program examines alternatives composed of different combinations of energy resource types. In developing a resource program, BPA prepares load forecasts jointly with the Council. A range of forecasts are prepared to reflect uncertainties about the future load growth. Next, a range of load/resource balances is prepared by combining the capability of the existing Federal system resources to the range of projected Federal system loads over the next 20 years. Concurrent with the process, BPA and the Council plan the acquisition of cost-effective resources as they are needed to meet growth.

BPA prepared an eis to support several resource programs. The Resource Programs eis considered the environmental trade-offs among the resources available to meet load and the environmental impacts of adding these resources to the existing system. For each of the resource types available, BPA provided a technical description, an analysis of operating characteristics and capacity contribution, costs, potential environmental effects and mitigation, and supply forecast. The potential environmental impacts of thermal resources were presented by average annual megawatt for the entire fuel cycle. Natural gas-fired combined-cycle combustion turbines were found to be relatively efficient and effective with a proven generation technology. They can be operated to meet both base loads and peak loads. They have high availability factors and offer the opportunity for displacement and dispatchability. This flexibility combined with their cost-effectiveness and relatively low environmental impacts (compared to other thermal generation) make combustion turbines an important part of BPA's energy future.

Figure 2-1 shows the mix of resources that BPA would acquire under twelve alternative strategies (the thirteenth strategy was no action). The alternative strategies combine energy conservation and generation resource development in differing proportions. Generation resources could include renewable energy resources, cogeneration and thermal resources. Renewable energy resources include hydro, wind, geothermal and solar power

generation. Cogeneration is the generation of electrical power in combination with a heat-producing process. Thermal resources include generation of power by combustion of oil, natural gas, or coal or by nuclear fission. Other means of meeting loads such as efficiency improvements, fuel switching and energy imports were also considered.

In its April 1993 Record of Decision (ROD) on the Resource Programs eis, BPA identified a management strategy for matching power supply with demand over the next two decades. The strategy is referred to as the "emphasize conservation alternative." This alternative is one of thirteen alternative strategies that BPA developed to meet a projected power deficit of 2,000 to 2,500 aMW in the year 2000. This projected deficit might be regarded as a worst-case condition, because high loads were assumed. In all likelihood, the deficit will be smaller. However, it is prudent to plan for the worst-case condition.

Under the "emphasize conservation" alternative, BPA would rely heavily on combustion turbines for its future power generation. Under this alternative, 1046 aMW of energy, or up to one-third of future acquisitions, would come from combustion turbines. Acquisition of Tenaska Washington II would be consistent with the emphasize conservation alternative.

Guided by the recommendations in BPA's 1990 Resource Program, BPA commenced a pilot resource acquisition process to test various approaches for acquiring a diverse portfolio of cost-effective, reliable, and environmentally sound resources. The Competitive Resource Acquisition Pilot Program is one of several methods that BPA tested to acquire energy resources. The primary objective of the pilot program is to provide BPA with the ability to systematically solicit, evaluate, and select cost-effective resource proposals that are offered for purchase. A secondary objective is for BPA to assess the benefits and costs of using a competitive process for developing cost-effective new energy supplies.

Figure (Figure 2-1 Alternative Resource...)

BPA issued a Request for Proposals in 1991 for 300 aMW of firm energy. In response to this solicitation, BPA received 102 resource proposals totalling 5,209 aMW of generation and 116 aMW of conservation. BPA evaluated the proposals based on system cost, project feasibility (including project location) and environmental criteria and selected three generation projects - the Tenaska Washington II project is one - and all cost-effective conservation projects for further consideration and review towards satisfying the 300 aMW target. Each of these projects is being evaluated independently because these projects are not alternatives to one another and they are not connected, cumulative, or similar actions, to the extent that the agency need examine them in a single NEPA document. NEPA compliance is discussed in more detail below.

2.3 ENVIRONMENTAL REVIEW

The Resource Programs eis discussed earlier does not address the site-specific environmental impacts of individual power projects. Instead, it considers the trade-offs among various resources available to meet needs and the environmental effects of adding those resources to the existing power system.

BPA is now considering individual power development proposals that fit within the framework of its overall power acquisition strategy. As part of its evaluation of individual proposals, BPA is preparing a number of site-specific environmental documents, which focus on the direct impacts of individual proposals at particular sites. These site specific documents will not re-examine the larger issues pertaining to different power acquisition strategies that were addressed in detail in the Resource Programs eis. Instead they will incorporate some of the analyses contained in the Resource Programs eis by reference. This approach to preparing environmental documents is referred to as "tiering." It is consistent with the Council on Environmental Quality's guidelines for implementing NEPA. Its primary advantage is that it avoids duplication of effort.

This document is a site-specific eis on the proposed Tenaska

Washington II project. It fulfills the requirements of NEPA and Washington State's legislative equivalent, the State Environmental Policy Act (SEPA). Pierce County Planning Department has contributed to the eis by providing review comments to ensure that SEPA and Pierce County's environmental requirements are met. Pierce County plans to satisfy SEPA requirements by adopting this eis. Pierce County will review the final eis and issue an "adoption form" if they are satisfied that it meets SEPA requirements. Pierce County can act on the proposed project seven days after issuance of the adoption form.

    

3.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

3.1 THE PROPOSED ACTION

The proposed action is the purchase by BPA of 240 aMW firm power generated at the Tenaska Washington II project.

3.1.1 Location

The proposed Tenaska Washington II power plant site would be located about 19 kilometers (about 12 miles) southeast of Tacoma, Washington, in the Frederickson Industrial Area of Pierce County. It would lie near the center of a partially developed tract bounded on the north by 180th Street East, on the south by 192nd Street East, on the east by Canyon Road and on the west by 38th Avenue. It would occupy an approximately 6.4-hectare (16-acre) parcel. The regional map of the proposed project is shown in Figure 3-1. A map of the project site and its vicinity is shown in Figure 3-2.

The proposed Tenaska Washington II power plant is in the center of the area that uses most of the power. Power generation at this location will be a very significant contribution in limiting potential voltage sag and economic curtailments that would result from a transmission line failure.

3.1.2 Proposed Facilities and Operations

The proposed facilities have three components: the power plant; an electrical transmission interconnection line connecting the power plant to BPA's South Tacoma facility; and modifications to the South Tacoma facility. The South Tacoma facility, currently a switching station, would become a substation after modification to accept energy from Tenaska Washington II.

Power Plant
The Tenaska Washington II power plant would occupy about half of the parcel and would consist of an approximately 1840-square meter (20,000-square foot) structure housing the electricity generators, a cooling tower, electrical switch yards, an oil storage tank, and several other tanks, pumps and connecting piping. All proposed project features would be contained within the proposed power plant area and transmission corridor. The tallest structure on the site would be the exhaust stack which would extend about 30 meters (100 feet) above the

Figure (Figure 3-1 Reginal Map...)

Figure (Figure 3-2 Site Location...)

ground surface. The structure housing the generators would be about 21 meters (70 feet) tall. An artist's impression of the proposed power plant is shown in Figure 3-3. This sketch is a general representation of the proposed power plant features and does not accurately portray the Frederickson Industrial Area, specifically other buildings and facilities (e.g., AMA Timber, Boeing) in areas surrounding the site. A plan of major equipment and buildings for the Tenaska Washington II power plant is shown in Figure 3-4. The heart of the Tenaska Washington II power plant would be a gas turbine. In a gas turbine, compressed air is mixed with natural gas and burned in combustion chambers. Rapidly expanding exhaust gases rotate a turbine as they exit the combustion chamber. The turbine drives the generator which produces electricity. Because the proposed power plant would be a combined cycle plant, hot gases leaving the gas turbine would enter the heat recovery steam generator where much of the waste heat would be used to produce steam.

This steam would then be used to rotate another turbine which would drive a second generator and produce more electricity. The heat recovery steam generator would be equipped with duct burners that will allow it to burn natural gas when additional heat is needed. Cooled exhaust gases would be discharged to the atmosphere through an approximately 30-meter (100-foot) high stack.

Although Tenaska Washington II would burn natural gas, it is capable of switching to a back-up supply of fuel oil. Fuel oil would be used only in emergency situations; only 120 hours of fuel oil burning would be permitted each year. The Tenaska Washington II power plant would be designed to minimize air pollutant emissions using the best available control technology (BACT). BACT for proposed power plants of this type is determined by the U.S. Environmental Protection Agency (EPA). Tenaska proposes that BACT for the plant be the combustion of natural gas or low-sulphur No. 2 fuel oil in combination with various emission reduction equipment. In addition, the proposed NOX control technology goes beyond current BACT requirements and would satisfy more stringent lowest achievable emission rate (LAER) requirements that do not apply to this project.

Under normal circumstances, the proposed power plant would be fueled with natural gas. Natural gas would be supplied to the power plant by the Northwest Pipeline Corporation from an existing pipeline which passes approximately 400 meters (approximately 0.25 miles) southeast of the proposed power plant site. A new pipeline stub would be built to connect the proposed power plant to the existing pipeline as indicated in Figure 3-5. Emergency back-up fuel oil would be stored on-site in an approximately 5,565-cubic-meter (35,000-barrel) tank surrounded by an earthen dike. The volume enclosed by the dike would be sufficient to contain the contents of the tank if it failed.

Water would be used at the proposed power plant for cooling and fire protection. It would be supplied by the TPU from an approximately 51-centimeter (20-inch) diameter main located in 192nd Street East. Cooling water would be recirculated through

Figure (Figure 3-3 Artist's Sketch of Plant)

Figure (Figure 3-4 Plant of Major Equipment...)

Figure (Figure 3-5 Natural Gas Line Routing)

a cooling tower to minimize total water demand. A cooling tower fan would be situated at the top of the tower and would run continuously at a relatively low revolutions per minute rate. Water would be stored at the site in an approximately 2,270-cubic-meter (600,000-gallon) tank. Sanitary wastewater together with the spent water, or blowdown from the boilers and cooling tower would be discharged to the Pierce County sanitary sewer.

The proposed power plant would operate continuously but can be displaced (taken off-line) at BPA's request to help meet its varying operational requirements. A staff of 25 to 30 people would work at the site. Fourteen people, responsible for management, administration, engineering and maintenance, would work a regular 40-hour workweek. The remaining staff would be shift workers operating the power plant around-the-clock. There would always be at least two operators at the power plant at any given time.

Electrical Transmission Line

Electricity generated at the proposed power plant would be sold to BPA for marketing through the regional power grid. The power grid in the vicinity of the proposed project is shown in Figure 3-6. A new 230-kV transmission line would be built to connect the proposed power plant to BPA's South Tacoma facility which is located about 550 meters (about 1,800 feet) northwest of the power plant site. There are two options for the transmission line interconnection. Option A would be installed underground and is Tenaska's preferred option. It would leave the power plant site at its northeast corner and proceed north to the Chehalis railroad right-of-way. The transmission line alignment would follow the railroad tracks westward past the Olympic Oil Pipeline pumping station, proceed north and northwest to BPA's property, and then turn northeast to the South Tacoma facility. Option A would be approximately 1,300 meters (approximately

4,200 feet) long. Option B would be installed above ground on a series of tubular steel towers mounted on concrete bases. The transmission line would leave the power plant site at its southeast corner and proceed southward to 192nd Street East. At 192nd Street East, it would turn west to the approximate location of 42nd Street East and then turn north, crossing the railroad tracks to the South Tacoma facility. Option B would be approximately 2,500 meters (approximately 8,000 feet) long. Both alternative transmission line routes are shown in Figure 3-7.

Modifications to the South Tacoma Switching Station
As part of the reconfiguration of the South Tacoma switching station to a substation, BPA would expand and modify existing facilities to accommodate electricity generated by the Tenaska Washington II power plant (Figure 3-8). The existing switching station lies near the center of an approximately 7.7-hectare (19-acre) parcel of land owned by BPA. The switching station occupies about 1.11 hectares (2.75 acres). New facilities would include power circuit breakers, disconnect switches, control and protective relaying, metering equipment, communications equipment, potential and current transformers, and a control

Figure (Figure 3-6 Power Grid in the Vicinity...)

Figure (Figure 3-7 Plot Plan Showing...)

Figure (Figure 3-8 South Tacoma...)

house. The fence line of the switching station would have to be altered to accommodate the new facilities. The new fence line would enclose about 1.14 hectares (2.82 acres). Several existing transmission lines connect to the South Tacoma switching station. Two 230-kV above-ground transmission lines, the Chehalis to Covington line and the Olympia to White River line cross the parcel of land owned by BPA. Transmission line disconnect switches located inside the existing South Tacoma switching station would be removed. These are mounted on wooden poles. The Olympia-White River 230-kV line and the Tacoma-Cowlitz 230-kV Tap to the Olympia-White River line will be terminated at the new substation with new dead end transmission structures. The new 230-kV transmission line (overhead or underground) to the Tenaska Washington II power plant would then be connected to the new substation switching facilities. Power from the Tenaska Washington II power plant would flow from the generation facility to the modified South Tacoma switching station and from there be integrated into the transmission grid.

BPA would install communications equipment on-site to provide an operational data and control line between the Tenaska Washington II project and BPA's operations center in Vancouver, Washington. Communications equipment would include a microwave radio antenna, radio receiver and transmitter connecting to the existing BPA microwave system and fiber optic cabling connecting the substation and generation project. The antenna dish, antenna support structure, and radio equipment would be located within the substation fence, with the radio equipment placed within a control house along with relays, meters and other electrical equipment.

The Covington to Chehalis transmission line currently goes through BPA property adjacent to the existing switching station. This line also has a tap to Tacoma's Cowlitz substation. The line disconnects would be removed from the existing switchyard to allow for the new substation construction, and the line disconnects would be relocated on BPA property outside the present fence, probably near a transmission line structure south of the present switchyard.

3.1.3 Probable Construction Scenario

The proposed power plant is expected to be built within an 18-month period. The maximum size of the construction crew would be from 225 to 250 workers. It is expected that most of the construction workers would be from the Tacoma area. 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. Solid waste and excess excavated materials would be

trucked to an approved disposal facility. Sanitary facilities would be provided for construction workers and would be installed, serviced and maintained by a commercial operator.

The reconfiguration of the South Tacoma switching station to a substation is expected to be accomplished within a 12- to 15-month period beginning in the fall 1994. Construction activities would require 15 to 20 workers (BPA employees and contractors). Ground disturbance in and around the existing switching station would take place, and would include grading, footings for structures, minor excavation, trenching for conduits, etc. Equipment used at the site would include light and heavy trucks and backhoes.

A 2-hectare (5-acre) construction staging area would be established in the northeast portion of the site. The staging area would be used for temporary material storage, offices and parking. On completion of the power plant, the staging area would be vacated and restored to its original condition.

Construction activities for the communications would include some ground disturbance within the substation for antenna structure footings and burial in conduit runs of the fiber optic cable. If Tenaska utilizes the overhead transmission interconnection line, the fiber optic communications cable would be configured with metallic wrapping and used as the overhead ground wire linking the power plant to the substation. If Tenaska utilizes the underground transmission interconnection cable, the fiber optic communications cable would be buried above the power cable, in a conduit. The conduit would be appropriately marked. No additional ground disturbance beyond that planned for power cable burial is anticipated.

3.1.4 Decommissioning

The Tenaska Washington II power plant would have a life expectancy of 20 to 40 years. If the proposed power plant were to reach the end of its useful life, it would be renovated or decommissioned. If the power plant were to be decommissioned, all structures and equipment at the power plant site would be dismantled and removed. Transmission interconnection lines and structures would also be dismantled and removed. BPA's South Tacoma substation would most likely not be decommissioned at the same time and would continue to serve the area.

3.2 ALTERNATIVES TO THE PROPOSED ACTION

3.2.1 No Action

Under the No Action alternative, BPA would not acquire the energy output from the proposed Tenaska Washington II power plant, thereby foregoing the opportunity to assist in hydrofirming, regional voltage support and reduction of BPA's projected energy deficit with this particular project. In that event, it is unlikely that the proposed project would be implemented without a commitment from another party to acquire the energy output.

3.2.2 Other Actions

Since the proposed action would reduce, but not eliminate BPA's need for power, other resources will likely be considered independent of the proposed action and the pilot acquisition program. Other resource types potentially available to meet future loads include the following:

- Conservation (commercial, residential, and industrial)
- Renewables (hydropower, geothermal, wind, and solar)
- Cogeneration
- Combustion turbines
- Nuclear power
- Coal and clean coal





4.0 AFFECTED ENVIRONMENT

4.1 GENERAL CHARACTERISTICS OF THE AFFECTED ENVIRONMENT

This section describes the environment that could be affected by construction and operation of the proposed Tenaska Washington II project. The description provides the baseline for comparison of no action to the proposed action. It serves as the basis for discussion of potential environmental consequences presented in Section 5.0.

The proposed power plant site is located on an approximately 6.4-hectare (16-acre) parcel of undeveloped land. Topographic relief at the site is moderate and characterized by historical glacial activity. Soils of the area are very permeable, and most rainfall infiltrates rapidly into the groundwater system. Clover Creek and Chambers Creek provide the primary surface drainages for the project site watershed. The site is a dry, weedy, upland area recovering from recent grazing practices. A Douglas fir stand is located in the southeastern corner of the site and several Oregon white oak stands are scattered throughout the site. Most wildlife species found at the proposed site are common to disturbed areas. State and Federal special status species listings indicated that no rare, threatened, or endangered species are known to inhabit the project site. However, a recent survey determined the presence of a population of Aster curtus a Federal Candidate species (C2) and listed as sensitive by the Washington Natural Heritage Program (1990). Wetlands are not present at the proposed site.

The project vicinity is not known for any historic events, historic landmarks, or cultural uses. Current land uses in the vicinity of the Frederickson Industrial Area include low-density residential housing and mobile homes, commercial services, light and heavy manufacturing, agriculture (mostly livestock grazing), and open space.

4.2 GEOLOGY AND SOILS

4.2.1 Geology

The project site is geographically situated in the northern section of the Puget Trough Province (Puget Sound Basin) of western Washington. This lowland province is bounded on the east by the Cascade Mountains and on the west by the Olympic Mountains and Willapa Hills. Its physiographic and geologic boundary extends north to the Canadian border, and south into Oregon through the Willamette Valley (Franklin and Dyrness, 1988).

Several glaciations during the Pleistocene era (2.5 million to 10,000 years before the present) have influenced the geology of this region. The most recent deposits are from the Vashon glaciation. These deposits are unconsolidated in nature and consist of mixtures of boulders, cobbles, gravels, sands, silts and clays (Walters and Kimmel, 1968). Geologic maps of Washington, including the Southwest Washington Quadrant and the South Half of Tacoma Quadrangle, confirm the presence of Vashon outwash for the site (Walsh, 1987; Walsh, et al., 1987).

The surficial geology of the general area is composed of Vashon recessional outwash, a mixture of stratified sand and gravel deposited by melt-water streams during the Vashon glacial retreat. This material is fairly well-sorted and quite permeable, becoming finer in grain and less permeable with increasing distance from the glacier (Brown and Caldwell, 1985).

Steilacoom Gravel, a specific unit of Vashon recessional outwash deposited by high-velocity streams and rivers, occurs over the site. This deposit is typically from 12 to 18 meters (40 to 60 feet) thick, and is composed of coarse gravel (2.5-centimeter [1-inch] pebbles) with sand occurring between gravel particles (Walters and Kimmel, 1968; Earth Consultants, 1989; Dames & Moore, 1980). Steilacoom Gravel is relatively high in permeability.

The Vashon Till, a mixture of clay, silt, sand, gravel and boulders, typically underlies the Steilacoom Gravel separating this upper aquifer from a lower aquifer, the Vashon Advance Outwash. There is evidence in the project vicinity (well borings from the Boeing Plant and from Spanaway) indicating that the Vashon Till is not present beneath the project site.

The Vashon Advance Outwash is an 8- to 15-meter (25- to 50-foot) layer (Brown and Caldwell, et al., 1985) and consists mostly of coarse-grained materials (sands, gravels, cobbles and boulders). High permeability due to the coarse nature of the rock materials is a contributing factor in making Vashon Advance Outwash the primary supply source for domestic wells in the region (Walters and Kimmel, 1968).

4.2.2 Geologic Hazards

The primary geologic hazards are those related to earthquakes. The subduction of the small Juan de Fuca plate (off the Northwest coast) beneath the North American plate is believed to be the primary cause of earthquakes in western Washington and Oregon (Noson, et al., 1988). Increasing evidence in recent years indicates that western Washington and Oregon are subject to (1) a greater risk of shallow-crustal earthquakes and (2) large subduction zone earthquakes, a type which has not occurred in the region for about 300 years (Walsh, 1993).

4.2.3 Soils

Soils in the Puget Sound basin were formed in glacial materials and reflect the underlying geology; the soils also formed under the influence of coniferous forests and grassland (Franklin and Dyrness, 1988). The Soil Conservation Service (SCS) has identified the soils at the site as Spanaway gravelly sandy loam. On the general soil map for Pierce County, the SCS has included the site in the Spanaway Association, which characterizes the soil as nearly level and somewhat excessively drained.

Mixed on the surface with volcanic ash, Spanaway soil exhibits moderately rapid permeability and slow surface water runoff. Approximately 36 centimeters (about 14 inches) of the uppermost soil profile is typically black, gravelly sandy loam, increasing with depth to about 152 centimeters (about 60 inches) below the surface.

The SCS indicates that the engineering properties of Spanaway soil do not present limitations for construction and urban development. Slopes are generally between 0 and 6 percent, and there is little erosion hazard. Surface water readily percolates downward due to the gravelly structure of the soil, making protection of groundwater supplies from aboveground contaminants a concern (SCS, 1979).

Test pits dug at the site indicated that the topsoil is composed of glacial outwash sands and gravels and fine-grained alluvial deposits. Beneath this is a layer of coarse sands and gravels with a variable silt, gravel, and cobble content (Dames & Moore, 1980). In almost every test pit, a thin layer of topsoil consisting of dark brown sandy silt with organic material was encountered at the surface and is believed to mantle much of the area (Dames & Moore, 1980).

4.3 HYDROLOGY AND WATER QUALITY

4.3.1 Groundwater

The proposed project site is situated in the Clover-Chambers Creek Basin, a broad glacial basin covering approximately 135 square kilometers (52 square miles). Clover Creek and Chambers Creek are the primary surface drainages, with Chambers Creek being the principal drainage outlet for the entire drainage basin. With the exception of small areas covered by low permeability materials in the northern and southern parts of the Basin, gravels cover the Clover-Chambers Creek Basin.

Most groundwater flow originating in the Clover-Chambers Creek Basin flows northwest toward "The Narrows," a narrow water channel separating Tacoma from the Gig Harbor Peninsula (Figure S-1). Groundwater flow drains into the entire area of "The Narrows" via three stratified units. The most shallow unit is approximately 45 meters (150 feet) below ground level; this is still above sea level, and water drains into the ocean as "surface water." The second unit lies approximately 100 meters (350 feet) below ground level, and the third lies approximately 160 meters (550 feet) below ground level. The majority of groundwater flow enters the ocean below sea level.

The aquifers of central Pierce County are recharged almost entirely by infiltration from direct rainfall. The impermeable nature of the consolidated rocks along the south and east margins precludes the possibility of movement of large quantities of water into central Pierce County from the mountains or foothills beyond. The slope of the water table in central Pierce County is extremely irregular, ranging from more than 23 meters per kilometer (120 feet per mile) in areas of great relief or relatively impermeable materials, to less than 1.8 meters per kilometer (10 feet per mile) in areas of little relief or coarse-grained, highly permeable materials. The average slope is about 9.4 meters per kilometer (50 feet per mile) (Walters and Kimmel, 1968).

Groundwater is the principal source of water supply for residences and small business in the Frederickson area. TPU also provides water to the area, including the Frederickson Industrial Area. The City's water supply is derived from the Green River, a surface water resource area located to the north in King County, and is augmented by groundwater. There are approximately 450 private and 45 public water supply wells within a 4.8-kilometer (3-mile) radius of the proposed site. These wells are under the authority of a number of water purveyors.

The proposed site is located above a regional shallow groundwater system that is generally found between 6 and 9 meters (20 and 30 feet) below the ground surface. The groundwater table typically fluctuates 1.3 to 1.5 meters (4.5 to 5 feet) during the year. Groundwater in the proposed project vicinity flows north towards Clover Creek (ENSR, 1993).

Groundwater Contamination

The depth to groundwater and the thickness of the unsaturated sediments are important factors to consider regarding land use activities that can contaminate the groundwater. Downward percolating surface waters pass through an unsaturated zone (called the vadose zone) and some contaminants are removed in this area from biological breakdown, filtration, and adsorption, thus reducing the amount of pollutants reaching the groundwater table. The thicker the vadose zone, the greater the chance for natural interception of pollutants. Because of the predominantly granular nature of the geologic material in the Clover-Chambers Creek Basin, the vadose zone does not provide a very effective pollutant interception (Brown and Caldwell, 1985).

Numerous groundwater quality problems have arisen in the central Pierce County area, most of which are located in the Clover-Chambers Creek basin. These problems have resulted from a history of industrial use in the area and mismanagement of hazardous materials and waste disposal activities (see Section 4.9, Public Health and Safety). Significant increases in groundwater concentrations of nitrate-nitrogen and chloride have occurred in the last 20 years due to contamination from septic

tanks and storm water recharge areas, although the levels were still well below drinking water standards in 1985 (Brown and Caldwell, 1985). The discovery of these problems combined with the fact that the area utilizes groundwater as a primary water source led to an effort to study the impacts of the contamination and protection of the resource. However, according to Pierce County Department of Health personnel, no drinking water problems are known to exist in the vicinity of the proposed site (ENSR, 1993).

Clover-Chambers Creek Groundwater Management Program

In 1986, the Washington Department of Ecology designated the Clover-Chambers Creek Basin as a Groundwater Management Area, which recognized that the area relied on groundwater as a water supply source and that the area was susceptible to groundwater contamination. This designation allowed the development of the Clover-Chambers Creek Basin Groundwater Management Program, which was initiated in 1988, and led to the completion of a Draft Program and an eis (Brown and Caldwell, 1990). The Clover-Chambers Creek Basin Groundwater Management Program identifies 16 management elements that are based on mitigating the potential groundwater contamination risks associated with certain land use activities. These elements are addressed by existing state and county regulations and supplemented by the Tacoma-Pierce County Health Department programs and regulations that are being developed.

The Tacoma-Pierce County Health Department is the lead agency responsible for the Groundwater Management Program. The County has adopted a "Critical Areas" designation which includes the area in and around the proposed project site. The area is designated as an "Aquifer Recharge Area" (Pierce County Code Chapter 21.16). The purpose of this designation is to prevent further degradation of groundwater quality through the control of land use activities. The Tacoma-Pierce County Health Department requires the developer to submit a hydrogeological assessment, to determine the potential impact to groundwater resources, for every commercial facility proposed within the Aquifer Recharge Area boundary.

Sole-Source Aquifer Designation

In May 1987, a petition for sole-source aquifer designation of the Central Pierce County aquifer system was submitted by the Tacoma-Pierce County Health Department to the EPA. The Clover-Chamber Creek Basin aquifer system is within this larger aquifer system. Designation as a sole-source aquifer is a Federal recognition that an aquifer is needed to supply 50 percent or more of the drinking water for a given area and for which there are no reasonably available alternative sources should the aquifer become contaminated. A benefit of the sole-source aquifer designation is that projects receiving Federal financial assistance which have the potential to contaminate the sole-source aquifer would be subject to EPA review. This review could either prevent a commitment of Federal funding or cause a redesign of the project. Because BPA, a Federal agency, is considering purchasing power from the proposed project, an EPA review may be required. This review process should take approximately 30 days. EPA took public comments on the petition to designate the Clover-Chambers Creek Basin a sole-source aquifer at an informational meeting in July 1993. The Chambers Creek Basin aquifer system was formally designated as a sole source aquifer on December 9, 1993. EPA may review and comment on the project pursuant to Section 1424(e) of the Safe Drinking Water Act.

Groundwater Regulations

The Washington Department of Ecology has adopted groundwater quality standards (WAC 173-200) which implement the state's policy that natural and existing groundwater quality be preserved. These regulations set numerical limits for specific water quality constituents.

Other regulatory requirements are related to potential groundwater contamination by hazardous materials and are addressed in Section 4.9 Public Health and Safety. These include the Preparedness and Prevention Measures, Contingency Plan, and Spill Prevention Control Countermeasure Plan, which would be submitted by the project developer to Ecology for

review and to the Tacoma-Pierce County Health Department for approval of compliance with regulatory requirements.

4.3.2 Surface Water

There are no surface water streams located on the proposed project site due to the highly permeable nature of the soils. Clover Creek originates northeast of the project site from a groundwater spring and flows westward down the basin, approximately 1,220 meters (4,000 feet) north of the project site.

4.4 AIR QUALITY

4.4.1 Meteorology

The project area experiences a mild climate with an average winter temperature of 4o C (40o F) and an average summer temperature of 16o C (62o F). The winters are wet and the summers fairly dry. The wettest month is November when precipitation averages 15 centimeters (5.7 inches) at the project site. Winds emanate predominantly from the southwest or northeast. Figure 4.4-1 shows a windrose for McChord Air Force Base which is located approximately 8 kilometers (5 miles) northwest of the project site.

4.4.2 Existing Air Quality

No air quality monitoring is currently being conducted at or near the project site. Background concentrations that are considered to be representative of the project site were provided by the Puget Sound Air Pollution Control Agency (PSAPCA) and the Washington Department of Ecology. They are shown in Table 4.4-1. The background concentration data in the table is limited to those pollutants that could potentially be affected by the proposed project.

Each of the air pollutants discussed in this section has potential health effects. Particulates can irritate the eyes, nose and air passages. Particulates with a diameter of 10 microns (PM10) (0.000393 inches) or less can lodge in the lung, irritating or damaging sensitive lung tissue. In addition, particulates may contain harmful pollutants that are toxic or radioactive elements that may cause cancer. Sulfur dioxide (SO_2) can cause symptoms similar to allergic reactions or viral respiratory infections. SO_2 quickly restricts air flow in the lungs, causing shortness of breath, coughing, and increased secretions. Long-term exposure causes chronic bronchitis and may contribute to asthma. Oxides of nitrogen (NO_x) irritate mucous membranes and cause coughing, headache, and shortness of breath. Carbon monoxide (CO) interferes with the delivery of oxygen throughout the body. Mild oxygen deficiencies can affect vision and brain function. Exposure to high levels can cause headache, irregular heartbeat, nausea, weakness, confusion, and death. Ozone can irritate the nose, throat, and lungs, increase airway resistance, and decrease the efficiency of the respiratory system. People exercising and those with respiratory disease can experience sore throat, chest pain, coughing, and headaches. Volatile organic compounds (VOCs) and NO_X are currently regulated as precursors to ozone formation.

Figure (Figure 4.4-1 Windrose for...)

TABLE 4.4-1
REPRESENTATIVE BACKGROUND AIR QUALITY DATAa

Pollutant		Background Concentration (ug/m3)
NO2 b		
	Annual	30
SO2 c		
	Annual	27
	24-hour	106
	3-hour	319
	1-hour	426
PM10 d		
	Annual	29
	24-hour	85
TSP e		
	Annual	41
	24-hour	121
Ozone		
	1-hour	130
CO c		
	1-hour	19 mg/m3
	8-hour	13 mg/m3

a Data limited to pollutant concentrations that could be affected by the proposed project
b Value reported by Department of Ecology (1992)
c As measured in Tacoma area (Ecology, 1991)
d Data from PSAPCA (Knectel, 1992) from measurements taken in Puyallup, WA
e Estimated from PM10 data assuming PM10 = 0.70 TSP (Knectel, 1992)

4.4.3 Regulatory Requirements

Air quality standards have been set by the United States, by the State of Washington, and by the PSAPCA. The standards fall into two general categories: emission standards that apply to air pollutant emissions as they emerge from a stack, and ambient standards that apply to atmospheric air.

Federal ambient air quality standards for certain pollutants were established in the Clean Air Act of 1970 and are referred to as National Ambient Air Quality Standards. The Clean Air Act has been amended several times, most recently in 1990. The State of Washington has adopted ambient air quality standards that are equal to, or more stringent than, Federal standards. The ambient air quality standards apply to a group of pollutants known as criteria pollutants which include: ozone (O3), CO, nitrogen dioxide (NO2), SO2, total suspended particulates (TSP), and PM10. In Washington, implementation of the Federal Clean Air Act has been delegated to the Washington Department of Ecology (DOE), and, in the project area, to the PSAPCA. The state's own air quality laws are also implemented by the Washington Department of Ecology and, in the project area, by the PSAPCA. Washington emission and ambient air quality standards are either the same as or more stringent than Federal standards.

Many urban areas are not in compliance with the ambient air quality standards. They are referred to as nonattainment areas. The project site lies within the Puget Sound Washington Intrastate Air Quality Control Region. The portion of the region that contains the project site is designated by the EPA as a nonattainment area for CO and ozone. It is in compliance for NO2, SO2, PM10 and the remainder of the criteria pollutants. The 1990 Clean Air Act Amendments require that nonattainment areas be brought into compliance with Federal ambient air standards within the next 6 to 20 years.

New Source Performance Standards (NSPS) for stationary gas turbines presented in 40 C.F.R. Section 60, Subpart GG, were

promulgated by EPA on September 10, 1979 and subsequently amended. The most recent edition of 40 C.F.R. Section 60, Subpart GG, was issued in July 1992, and was the basis for the analysis in this eis. NSPS turbine standards limit potential emissions of nitrogen oxides and SO2 from certain classes of stationary gas turbines. NSPS rules affect sources constructed or modified after the proposed date of the applicable NSPS. In the case of the Tenaska Washington II project, the date is October 3, 1977.

Proposals for new facilities that may impact air quality are subject to a process called New Source Review. If the proposed facilities are in a nonattainment area for a particular contaminant, then it must be determined whether the new facilities will significantly affect the area's ability to attain the standards in the future. This is done by comparing the emissions from the new facility, and its predicted effects on ambient air quality, with significant impact threshold levels established by the PSAPCA. If the new facility emits less than the specified threshold amount of air contaminants, and will produce less than the specified threshold change in ambient air quality, it is judged to have a less than significant effect on the area's future ability to meet ambient standards and would, therefore, be permitted. If the new facility exceeds the threshold levels, the project proponent has three options: to withdraw the proposal; to modify the proposal so that it can meet the threshold levels by adding emission control equipment; or to provide offsets. Offsets are ways in which the increased emissions from a new facility are compensated for by reductions in emissions from an existing facility.

The PSAPCA and the Washington Department of Ecology have listed certain substances as toxic air pollutants and established acceptable source impact levels (ASIL) for them. The PSAPCA's list of toxic air pollutants includes all substances listed in the National Emission Standards for Hazardous Air Pollutants (NESHAP). The ASILs are equally or more stringent than NESHAP.

4.4.4 Global Warming

Throughout the world, energy is obtained and goods and services produced primarily through the burning of fossil fuels. These combustion processes, while providing a fuel source, emit CO2 and increase the amount present in the earth's atmosphere. Some experts within the scientific community believe that the increase in CO2 is leading to a global temperature increase, or global warming, because CO2 can trap heat in the earth's atmosphere. Because of CO2's ability to trap heat in the earth's atmosphere, it is believed that global warming could have adverse effects on life on earth (see discussion under Section 5.4.2, "Impact AQ3-1").

4.5 BIOLOGICAL RESOURCES

This section describes existing biological resources including vegetation, wildlife, sensitive species and wetlands at the proposed project site and nearby areas. For purposes of the biological resources section, the project site is defined as the area that would be disturbed by construction and over which the proposed power plant would be constructed. Additionally, the project vicinity refers to the Frederickson Industrial Area (shown in Figure 4.6-1 in Section 4.6, Land Use) and the surrounding area within an approximate 3-kilometer radius (2-mile radius).

Survey methods, limitations and tables summarizing flora observed at the site are located in Appendix E. Detailed descriptions of state- and Federal-designated Candidate species are also located in Appendix E.

4.5.1 Vegetation

The project site is basically a dry upland area recovering from past grazing practices. Left undisturbed it would eventually support a mixed forest of Douglas-fir and Oregon white oak. Two major vegetation assemblages occur within the project site: upland weedy fields and a wooded area. Upland weedy fields cover approximately 85 percent of the site, primarily consisting of invasive grasses, herbs, and shrubs. Grazing, logging, and pasture management have replaced native species with introduced pasture grasses tolerant of grazing. Within the upland weedy fields, approximately 10 to 15 percent of the site is collectively covered by St. John's wort, red fescue, English plantain and hairgrass. Scotch broom, the most predominant shrub, covers roughly 15 percent of the site. A more detailed discussion and summary of vegetation is included in Appendix E.

The wooded area of the site can be subdivided into stands of Oregon white oak and Douglas fir stands. Two stands of Oregon white oak are located in the project site. The first oak stand, located roughly at the middle of the northern site perimeter, is composed of about 20 trees. These trees range in diameter-at-breast-height (DBH) from about 5 to 65 centimeters (2 to 25 inches) and in height from about 1.4 to 12 meters (4.5 to 40 feet), with an average DBH of about 30 centimeters (12 inches) and average height of about 7.5 meters (25 feet). A second stand of Oregon white oak is located at approximately the center of the site. There are roughly 35 trees with an average DBH of about 25 centimeters (10 inches) and height of about 7.5 meters (25 feet), respectively. Both of these stands consist of relatively young trees (20-70 years in age) and cover about 0.08 hectare (0.2 acre) collectively. Several other Oregon white oaks are scattered throughout the property. These oak stands may be subject to examination as potential critical habitat under Pierce County Code 21.18.030. If the stands qualify under the ordinance, Pierce County would consult with Washington Department of Wildlife (WDW) to help determine specific impacts or mitigation.

A single Douglas-fir stand is located in the southeastern corner of the site. This stand measures approximately 0.4-hectare (1-acre) and consists of roughly 120 trees (including saplings). These trees have an average DBH of 65 centimeters (25 inches) and an average height of 14 meters (45 feet). This stand is young, about 50 to 80 years old, and contains 15 or more large, recently downed trees, most likely attributable to the unusually strong windstorm which occurred about 10 days prior to the field survey.

4.5.2 Floodplains/Wetlands

The WDW Priority Habitat and Species (PHS) and U.S. Fish and Wildlife National Wetland Inventory (NWI) maps indicated that no wetlands occur at the project site itself. A copy of the NWI map is provided in Appendix E. A series of wetlands are located roughly 365 meters (1,200 feet) due south of the site. The aerial photo did not show possible wetland signatures at the site.

Field surveys also did not indicate the presence of wetlands. The majority of plants observed throughout the site consisted of upland, weedy grasses, herbs and shrubs, as described above. The SCS has mapped the site as Spanaway gravelly sandy loam (41A), which is a well drained soil. Soil sampling at the site verified the non-hydric nature of the soil. Samples did not exhibit organic characteristics (peaty/mucky soils) and lacked low chroma matrix, gleization, signs of leaching, and mottling typical of hydric soils. Several locations were sampled throughout the site, including the lowest point, which appeared to be located in the bottom of a swale. However, because of the lack of proximal water features, the overall flat nature of the site, and the lack of wetland vegetation, it is believed that

this swale is artificial and created from temporary earth-moving practices.

The proposed project site is located in an upland area and is not contained within a 100- or 500-year floodplain and is not susceptible to prolonged inundation. The Federal Emergency Management Act (FEMA) indicates that the closest 100-year floodplain is located approximately one mile north of the site near Clover Creek (Woodward-Clyde Consultants, 1992).

4.5.3 Wildlife and Wildlife Habitat

The project site is located in an area with disturbed wildlife habitat. Industrial facilities, scattered residential units and undeveloped areas surround the site. Vegetation at the industrial and residential locations has been altered, in many cases by grading and removal of natural habitat. In addition, undeveloped areas have been subject to intensive grazing practices or removal of native vegetation.

Stands of oak and Douglas-fir trees provide canopy cover and potential nesting, breeding and food sources for wildlife. In addition, upland weedy fields, primarily located in the western and northeastern portions of the site, provide potential forage and ground nesting/den habitat for small mammals and birds. However, these tree stands are small and isolated from higher quality habitat (i.e., areas with greater diversity, less disturbance, and larger size).

Those factors listed above limit potential wildlife habitat within the project vicinity and at the site. Most species occurring at the site are quite common and may be considered habitat generalists.

Wildlife (or recognizable signs) observed during field surveys include small mammals (such as moles and voles) and birds. A complete listing of species has been included in Appendix E.

Upland weedy fields are rated as moderate habitat value for wildlife because they provide some cover and source of food for a variety of species. They are rated as low habitat value for vegetation because plant species present are typically non-native/
invasive and widely distributed outside of the project study area.

The wooded area located at the site is rated as moderate habitat for wildlife and vegetation because it is: composed of a moderate assemblage of species; degraded but not transformed from its original state; and common in surrounding areas.

4.5.4 Sensitive Species

A review of state and Federal special status species listings indicated that no rare, threatened or endangered species are known to inhabit the project site. However, a recent survey determined the presence of a population of Aster curtus, a Federal candidate species (C2) and listed as sensitive by the Washington Natural Heritage Program (1990). (Salix Associates, 1993). Ten other candidate species may be present in the project vicinity. A summary of these species, including their Federal and state status, is provided in Table 4.5-1. Detailed descriptions of these species are located in Appendix E.

The WDW's PHS database indicates that several sensitive species have been recorded in the project vicinity, although none within less than 3.3 kilometers (2 miles) of the project site. They include the western bluebird (Sialia mexicana), western gray squirrel (Sciurus griseus), great blue heron (Ardea herodias), purple martin (Progne subis), bald eagle (Heliaeetus

leucocephalus), and the fisher (Martes pennanti).

In their response letters, both the Washington DNR and the U.S. Fish and Wildlife Service (USFWS) indicated that although no Federal- or state-listed rare, threatened or endangered species were known to inhabit the project site, several proposed and candidate species may be present in the vicinity. Copies of agency response letters are located in Appendix C. These species include one plant, the white-top aster (Aster curtus) which was found on the project site, one bird, mountain quail (Oreotyx pictus), two amphibians, northern red-legged frog (Rana aurora aurora), and spotted frog (Rana pretiosa) and one mammal, Tacoma western pocket gopher (Thomomys mazama tacomensis).

In addition to those sources listed above, a review of the WDW publication entitled "Management Recommendations for Washington's Priority Habitat and Species" was reviewed for potential sensitive habitat (i.e., habitat which is either sensitive and/or habitat which supports sensitive species) within the project site. No sensitive habitat was determined present for the project site. A review of sensitive species indicated that several species could be associated with habitat found within the project area. These species include the Columbia white-tailed deer (Odocoileus hemonius columbiannus), pileated woodpecker (Dryocopus pileatus), western bluebird (Silalia mexicana) and western gray squirrel (Sciurus griseus). Although the project site supports habitat for these species, it is unlikely that any of these species would rely on this area as prime habitat because of the disturbed nature of the surrounding area and because the amount of forested area is small and relatively isolated.

TABLE 4.5-1
ENDANGERED, THReaTENED, CANDIDATE, AND PROPOSED SENSITIVE PLANT AND WILDLIFE SPECIES POTENTIALLY OCCURRING IN THE PROJECT STUDY ARea

Species	Common Name	Federal Status	State Status	Observed at Site	Habitat in Study Area
FLORA					
Aster curtus	white-top aster	C2	SS	Yes	Marginal
FAUNA					
Siala mexicana	western bluebird	S	SC	No	Marginal
Sciurus griseus	western grey squirrel	--	SC	No	Marginal
Ardea herodias	great blue heron	--	M	No	No
Pronge subis	purple martin	S	SC	No	No
Heliaeetus leucocephalus	bald eagle	T	T	No	No
Martes pennanti	fisher	C2	SC	No	No
Oreotyx pictus	mountain quail	C	--	No	Marginal
Rana aurora aurora	northern red-legged frog	C	M	No	No
Rana pretiosa	spotted frog	C	SC	No	No
Thomomys mazama tacomensis	Tacoma western pocket gopher	C	SC	No	Moderate

Federal Status Codes (Category)
- T - Threatened
- E - Endangered
- C - Federal Candidate. Information sufficient to support the appropriateness of being listed as endangered.
- C2 - Under Review. Information insufficient to support the appropriateness of being listed as endangered
- S - Sensitive. A species which is vulnerable or declining and may become a candidate; informal designation.

State Status Codes (Washington Department of Wildlife or Washington Department of Natural Resources)
- T - Threatened
- SC - State Candidate. Information sufficient to support the appropriateness of being listed as threatened, rare or sensitive.
- M - State Monitor Species.
- SS - State Sensitive. A vascular plant tax on which is vulnerable or declining, and could become endangered or threatened in the state without active management or removal of threats. DNR has no regulatory authority to protect sensitive species; they only operate under an

advisory/review role to other agencies.

The closest siting of any of the species listed above is that for the Western bluebird which has been sited roughly 3.2-kilometers (2-miles) west of the project site; however, these species are nesting in artificial nest boxes and not in natural cavities. The project site does not support natural cavities. It is highly unlikely that any sensitive species use this area either for migration, nesting or as a prime feeding area and no sensitive habitats are located here.

4.6 LAND USE AND COMMUNITY CHARACTER

For purposes of the land use discussion, the project site is defined as the area that would be disturbed by construction and over which the facility would be constructed. The project vicinity refers to the Frederickson Industrial Area.

4.6.1 Existing Land Uses

The proposed project site is located in the Frederickson Industrial Area of Pierce County. The area where the proposed project would be situated is zoned Heavy Manufacturing. Boundaries and zoning designations for the Frederickson Industrial Area are shown in Figure 4.6-1. The proposed power plant would lie within a tract of land bounded on the north by 180th Street East, on the south by 192nd Street East, on the east by Canyon Road, and on the west by 38th Avenue East.

Land uses within the vicinity of the Frederickson Industrial Area include low-density residential and mobile homes, commercial services, light and heavy manufacturing, and agricultural settlements (domestic livestock and garden production). Existing land uses surrounding the project site are shown in Figure 4.6-2. Primary land uses surrounding the site are heavy and light industrial and scattered low-density residential and agricultural.

The proposed power plant site is bordered on the north, south, east and west by open and undeveloped areas. However, the open area to the south was cleared of vegetation, and an industrial facility was constructed in 1993. AMA Timber Products occupies a parcel of land to the southwest of the site. Improvements include two large buildings and paved and graveled areas.

East of the proposed power plant site is an area, approximately 150 meters (500 feet) wide and 300 meters (1,000 feet) long, which has been graded at some time in the past. Sparse weeds and shrubs are present there. East of the project site is a light industrial complex (a floral warehouse and wholesale business) and several mobile homes. To the north of the site and beyond the open area and the Chehalis Western Railroad is a single-family residence surrounded by a Christmas tree farm. Two other single family residences are located near the Christmas tree farm about 60 meters (200 feet) east of 184th Street.

Figure (Figure 4.6-1 Fredrickson Industrial...)

Figure (Figure 4.6-2 Existing Land Used...)

A gas-fired, peaking unit power plant used during periods of peak demand is located about 600 meters (2,000 feet) due south of Tenaska's site, on the far side of 192nd Street East.

A new Boeing facility has just been completed about 1,126 meters (0.7 miles) northeast of the site. This facility will provide aircraft parts in support of Boeing assembly divisions at Everett and Renton, Washington. The site area is about 213 hectares (527 acres) (Boeing, 1991).

The facilities needed to connect the proposed power plant to BPA's electrical power distribution system are a part of the proposed project. BPA's South Tacoma switching station is located approximately 600 meters (2,000 feet) northwest of the power plant site. The switching station lies near the center of an approximate 7.7-hectare (19-acre) parcel of land owned by BPA. The switching station itself occupies about 15 percent of this parcel. Transmission lines associated with this facility are discussed in Section 4.11 and shown in Figure 3-7. North of the switching station, on the far side of 180th Street East, is a small residential area. In addition to the switching station, a pumping station, Olympia Pipeline Pump Station, is located approximately 400 meters (1,300 feet) northwest of the site, between the proposed power plant and the switching station.

Planning Background and Zoning Designations

Growth management policies for the State of Washington are regulated by the State Legislature under the Washington Administrative Code (WAC) 365-195 and contained within the 1990 Growth Management Act. Responsibility for implementation of these policies is delegated to each county. The codes require counties to meet the goals, mandates and standards outlined in the Growth Management Act, as well as any local requirements.

Pierce County zoning designations, including the Frederickson Industrial Area, are outlined in the 1962 Plan. Pierce County is currently revising the plan to conform to the 1990 Growth Management Act. The revised plan (1994 Plan) is expected to be adopted by July 1994. The Tenaska Washington II project was specifically included in the Draft Comprehensive Plan for Pierce County in June 1993.

In March 1991 the Frederickson Industrial Area was subject to its own area-wide rezone (Frederickson Rezone). Under the 1962 Plan, the Frederickson Industrial Area was designated Rural Residential, Suburban Residential, Extensive/Extractive Industrial and General Use (G). New zoning designations for the area include Heavy Manufacturing (M-2), Commercial (C-3), Suburban Residential (SR-12) and Suburban Agricultural (SA-12), both with a minimum lot size of about 1,115 square meters (12,000 square feet) per dwelling unit. In addition, several locations are zoned Residential Estate (RE-30), with an approximately 2,790-square meter (30,000-square foot) dwelling unit designation.

The site and a portion of the surrounding area is owned by the Port of Tacoma and is designated in the 1962 Plan as Heavy Industrial. Although it is located within the Frederickson Industrial Area, it was not included in the Frederickson Rezone and thus, is not directly affected by changes therein.

4.7 HISTORY AND ARCHAEOLOGY

This section describes cultural resources at, and surrounding, the proposed project site, and the methods used to identify these resources. The study area for cultural resources encompasses the proposed new facilities, including new structures, construction staging areas, fencing, utility lines, new and improved access roads, and power transmission and pipeline routes. Field methods used for the archaeological survey are included in Appendix F.

4.7.1 Prehistoric and Historic Occupation of the Southern Puget Sound Region

Human occupation and use of the southern Puget Sound region can be separated into two distinct time periods, prehistoric and historic. Prehistoric times include the period prior to exploration of the region by Euroamericans (individuals of European descent living in America) from approximately 8,000 years before present to roughly 200 years before present. Historic times include the period beginning with initial

exploration by Euroamericans, or roughly the past 200 years.

4.7.2 Ethnohistory

Before 1855, the Nisqually and Puyallup Indians, both Coast Salish-speaking groups, occupied lands that encompass the project study area. After 1855, they were moved to reservations in central Oregon and Washington. Nisqually and Puyallup tribes extended their settlement-subsistence systems from Puget Sound inland along riverine areas and in other drier, inland environments (Smith, 1940). Movement patterns of these tribes were based primarily on seasonal availability of food sources, with focus of the yearly cycle on the permanent winter village (Smith, 1940).

4.7.3 Prehistoric Period

Archaeological sites for this time period are primarily located in coastal and lowland zones and include shell middens (deposits of shells and refuse found in areas frequently occupied), lithic scatter (sites which consist of variably-sized scatters of stone tools and waste material produced during tool manufacture) and rock shelters (containing lithic artifacts and limited amounts of bone). Of these three categories, lithic scatters and shell middens constitute the most widespread and best archaeological sites.

4.7.4 Historic Period

The historic period is defined primarily through the discovery and settlement of the area by Euroamericans. During the late eighteenth century, Americans began to establish their presence in the area. In 1818, the United States and Great Britain agreed to joint occupation of the Pacific Northwest, with Great Britain remaining the dominant force, particularly north of the Columbia River.

The earliest American settlers in the southern Puget Sound region came in 1845 to establish the town of New Market at Tumwater Falls, Washington (Heritage League, 1990). In 1853, Congress created the Washington Territory, and in 1889, Washington achieved statehood. The Donation Land Claim Act (DLCA), which granted each white male 130 hectares (320 acres) of land in the Puget Sound basin, provided additional incentive for Americans to settle the Pacific Northwest.

4.7.5 Historic Use of the Study Area

The project vicinity is not known for any historic events or landmarks. The study area (site) is not developed and historically has been used for livestock grazing.

4.7.6 Survey Results

No cultural resources were identified or observed at the project

site or in the vicinity of the site during either the pre-survey investigation or field reconnaissance. No resources are indicated in the project area on the National or State Registers of Historic Places, or on the Washington State Archaeological and Historic Sites Inventories. However, construction of the proposed power plant would require grading and excavation of the site which could disturb buried or obscured cultural resources not detected during the field survey.

4.8 SOCIOECONOMICS AND PUBLIC SERVICES

This section describes the socioeconomic environment in the vicinity of the proposed project, and includes the City of Tacoma and nearby communities of Pierce County that are within commuting distance.

4.8.1 Population

The population of Pierce County has grown over the past 6 years from 530,800 in 1986, to 624,000 in 1992. About 40 percent of the Pierce County 1992 population lived in incorporated cities and towns. Tacoma is by far the largest city in this county, with about 179,000 people in 1992. Puyallup, the second largest city, has 25,400 people, while the remaining jurisdictions each have less than 7,500 people (Populations of Cities, Towns, and Counties Used for the Allocation of State Revenues, State of Washington, June 30, 1992).
The Pierce County census tract for the Frederickson Area where the proposed project would be located (tract 714.01), indicates a 1980 population of 4,069, and a 1990 population of 5,655 (Puget Sound Council of Governments, February 1991). The County Public Works Department has an even smaller population tract increment developed for transportation zones. The population within the transportation area zone, which includes the area of the proposed project bounded by Canyon Road to the east, 192nd Street to the south, 38th Avenue to the west, and 176th Street to the north (TAZ 711) was 1,622 people in 1990 (Puget Sound Regional Council, Working Forecasts, February 14, 1993).

The new Boeing facility, one of the first large developments in the Frederickson area, located to the north and east of the proposed facility, is expected to have a considerable impact on population growth in Pierce, King, Kitsap, Snohomish, and Thurston Counties. The plant is expected to have a working population of 11,419 employees per day by 2010 (Boeing-Pierce County eis, 1991). The greatest Boeing-induced population growth is estimated for Pierce County where it is expected to be 23.5 percent greater than growth without development of the Boeing plant (Growth Impacts of Boeing-Frederickson, South County Council of the Tacoma-Pierce County Chamber of Commerce, 1992).

4.8.2 Housing

In 1991, there were 196,671 housing units in the Tacoma-Pierce County area, with 3.6 percent, or 7,007 units vacant. Vacancy rates fell from 4.2 percent in 1986, and 4.1 percent in 1988. The total number of units in 1991 can be broken down into single family detached homes, mobile homes, and multi-family homes. Of the 134,184 single family homes, 2.5 percent were vacant; of the 45,075 multi-family homes, 6.5 percent were vacant. There were 9,613 mobile homes, with 2.4 percent vacant (Housing Survey Summary, Tacoma-Pierce County Chamber of Commerce, July 1992).

The nearest residential units are located to the north of the proposed project in a small tract of 10 to 12 homes, with the closest homes located about 550 meters (1,800 feet) away. A residential community about 1,200 meters (4,050 feet) to the south of the proposed project is located along 224th Avenue, and is separated from the Frederickson Industrial Area by an approximately 410 meter-wide (1,350 feet) wooded buffer (May 3, 1992, color aerial photograph, scale: 1 centimeter equals 55 meters [1 inch equals 450 feet]).

4.8.3 Employment

Employment data is available from the Puget Sound Council of Governments for forecast and analysis zones defined partially by the 1980 census tracts. The total number of people employed in the Spanaway forecast and analysis zone of Pierce County, which includes the Frederickson Industrial Area, rose from 824 in 1970, and 1,593 in 1980, to 2,395 in 1990. The number of people employed is projected to be 3,549 in the year 2000 and 5,640 in the year 2020. In 1970, the majority of jobs were held in the government and education sector (504 people). By 1990, retail trade employment had tripled, 164 to 493, and service industries employment had increased by a factor of 6, 104 to 652. Projections for the years 2000 and 2020 indicate that employment in services will nearly match employment in government and education, whereas employment in retail trade will be about double, 338 to 662, the 1990 value.

4.8.4 Tax Revenues

The 1991 General Fund budget for Pierce County was $322,449,930. Of this budget, $54,222,460 came from property and other local taxes (Annual Budget for Fiscal Year 1991, Pierce County Council Ordinance No. 90-140S).

4.8.5 Fire Protection

The project site is located in Fire District No. 7. Fire District No. 7 is staffed by 30 full-time employees and operates one station at 176th and 22nd Avenues East (Headquarters station 71), one at 3421 East 224th Street (Station 72), and another at 162nd Street and Park Avenue (Station No 73). Areas that are served by District No. 7 include the Chehalis Western Railroad, Pacific Avenue, Canyon Road, 192nd Street East, and 176th Street from Pacific Avenue (Lisa Trett, Fire District No. 7, pers. comm., April 21, 1993). Fire District No. 7 is bordered by Fire District No. 21 to the east of Canyon Road. Because of its proximity, the proposed project may have an effect on Fire District No. 21 as well.

Inspections for compliance with fire codes are provided by the Pierce County Fire Prevention Bureau (a division of the Pierce County Department of Emergency Management) rather than the fire districts, which are formed as special taxing districts in the State of Washington (Boeing-Pierce County eis October 1990).

4.8.6 Law Enforcement

Law enforcement services in the project area are provided by the Pierce County Sheriff's Department, which serves the unincorporated portions of the county and is staffed by 227

commissioned officers and 54 noncommissioned staff. Responsibilities of the Sheriff's Department include traffic control, crime prevention services, and support investigation services, except for the area east of Interstate Highway 5 (I-5), which is handled by the Washington State Patrol under a special agreement (Boeing-Pierce County eis, October 1990).

4.8.7 Education/Schools

The Bethel School District No. 403, with headquarters in Spanaway, serves an area of approximately 570 square kilometers (220 square miles), including the project site, and about 10 percent of the County population. The district operates 14 elementary schools, three middle schools, and two high schools, as well as an alternative school, a transportation center, an educational service center, two preschool centers, and a warehouse/maintenance facility. A new elementary school opened in the fall of 1992. The 1990-91 school year student enrollment is estimated at 11,500 (Boeing-Pierce County eis, October 1990).

4.8.8 Libraries

The Pierce County Library District serves the area with branches and bookmobile services. The South Hill library, opened in 1990, is located at 154th and Meridian and serves eastern Pierce County. Two additional buildings were completed in 1992, the Graham branch, located at 224th and 90th Street, and the Summit Branch, behind the shopping center on 112th Street and Canyon Road (Boeing-Pierce County eis, October 1990).

4.9 PUBLIC HeaLTH AND SAFETY

The Tenaska Washington II project would involve the use of some products and processes during construction and operation that could affect public health and safety if improperly handled. For example, ammonia would be used and stored on site for cleaning purposes. If the ammonia is not properly handled, it could pose a risk to public health. Lubricating oils, hydraulic fluids, cleaning solvents, paints, paint thinners, wastewaters from the cooling tower collection sump, and other materials and process wastes would be found on site, and could pose a risk to public health and safety if not used and disposed of properly.

Other potential concerns and proposed mitigation measures which have been addressed include:

- Hazardous material may be present at the site and could be disturbed during construction.
- Improper handling of hazardous materials used, stored, or generated during construction and/or power plant operations could result in an accidental release to the environment.
- Natural gas and fuel oil used or stored on-site are flammable and could be explosive under certain circumstances.
- Toxic materials could be emitted to the air in the power plant exhaust.
- Electrical transmission lines could pose an electric shock hazard.
- Electrical transmission lines could increase the exposure of individuals to electric and magnetic fields.

Background information on each of these potential health risks is discussed in this section, except toxic air pollutant

emissions, which is discussed in Section 4.4.

4.9.1 Phase I Environmental Site Assessment

Before a site can be developed, a study is conducted to assess whether hazardous materials could exist in the soil or underlying groundwater as a result of prior use or migration of pollutants from an adjacent site. This study is referred to as a Phase I Environmental Site Assessment. Such a study was completed for the proposed project by ENSR Consulting and Engineering in 1992. The study was limited to a review of historical land use information and a preliminary site survey. No soil or groundwater samples were taken at the proposed site; however, there was information available from groundwater monitoring wells of an adjacent property and this information was discussed in the ENSR report.

The preliminary site survey indicates that the site and adjacent properties were used for livestock grazing until 1985. There has been no prior industrial use of the site. This information, together with the results of the field survey, led to the conclusion that there is no evidence to suggest that hazardous materials or petroleum hydrocarbons are present at the site.

If the presence of hazardous materials is suspected at a site, a Phase II Environmental Site Assessment must be conducted. Such a study was conducted for a site located adjacent to and south of Tenaska's site. As part of the study, four groundwater monitoring wells were constructed at the adjacent site. It was the conclusion of the investigators that no contamination resulting from hazardous materials or petroleum hydrocarbons is evident adjacent to the site.

A similar Phase II study was conducted for the Boeing site located about 1.2 kilometers (0.75 mile) to the east (Pierce County, 1991). The Boeing site has been used for industrial purposes since 1935. Low levels of carbon tetrachloride, nickel, beryllium, arsenic, and chromium were found in samples taken from groundwater wells. Because of the northward flow of groundwater, these contaminants would not be likely to migrate to the proposed Tenaska Washington II project site.

Other potentially significant land uses, located primarily within about 76 meters (250 feet) of the proposed site, include the Puget Sound Power and Light (Puget Power) Frederickson-Spanaway substation, and the Washington Natural Gas compressor station, which are located to the south of the proposed site across 192nd Street East. Documents reviewed at the Washington Department of Ecology did not indicate that there had been a release of hazardous material or waste from Puget Power (ENSR, 1993). The only known potentially hazardous material that is near the site is natural gas contained in a buried 66-centimeter (26-inch) pipeline maintained by Northwest Pipeline Corporation (NPC), and the Olympic pumping station, which is a refined petroleum metering facility that provides gasoline and aviation jet fuel in the Pacific Northwest. NPC pipeline would provide natural gas for the proposed Tenaska Washington II project.

4.9.2 Electric Shock Hazard

There is no existing electrical service to the proposed site. The closest electrical transmission lines are an overhead 110-kV Tacoma Public Utility power transmission line, located about 230 meters (750 feet) from the proposed site, a 12.5-kV overhead power line located along 38th Avenue East, approximately 915 meters (3,000 feet) from the proposed site, and a 115-kV overhead Puget Sound Power and Light Company power transmission line located along 192nd Street East, approximately 365 meters (1,200 feet) from the proposed project.
The proposed project has two options for constructing new power

lines: overhead power lines or underground cables. Either type of new power line would be designed and constructed in accordance with the National Electrical Safety Code (NESC). NESC specifies the minimum allowable distances between the lines and the ground or other objects. These requirements basically determine the edge of the right-of-way and the height and placement of the line (i.e., the closest point that houses, other buildings, and vehicles are allowed to the line).

Because they are buried and out of reach, underground cables are not normally associated with shock hazards as much as overhead lines. However, excavation and trenching activities, which could take place at a later date (i.e., after completion of Tenaska's line), could present shock hazards to construction workers.

4.9.3 Electric and Magnetic Fields

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

Electric and magnetic fields are found around any electrical wiring, including household wiring and electrical appliances. Average electric field strength in the home from electrical appliances is typically less than 0.10 kilovolts per meter, and average magnetic field strength in the home is typically between 1 and 100 milligauss (mG). Magnetic fields of tens of hundreds of mGs can be present when standing very close to appliances carrying high currents. In the middle of rooms away from wiring and appliances, the average magnetic field is typically less than 1 mG. Typical electric and magnetic field strengths for some common electrical appliances are given in Table 4.9-1.

Both electric and magnetic alternating current (AC) fields induce currents in conducting objects, such as people and animals. These currents, even from the largest power lines, are too weak to be felt. However, some scientists believe that these currents might be potentially harmful and that long-term exposure should be minimized. Hundreds of studies on electric and magnetic fields have been conducted in the United States and other countries. A summary of electric and magnetic field studies can be found in Appendix D.

Unlike electric fields, magnetic fields are not reduced in strength by trees and building material. Thus, magnetic fields are of a greater concern to public health and safety. Power lines can be the major source of magnetic field exposure within a home located close to a power line. Typical electric and magnetic field strengths for some BPA overhead transmission lines are given in Table 4.9-2.

Underground cables, because of their insulated design format and buried state, do not generate an external electric field. In addition, with the design being proposed for this project, magnetic field profiles decrease considerably faster than with overhead power lines.

TABLE 4.9-1
TYPICAL ELECTRIC AND MAGNETIC FIELD STRENGTHS FROM COMMON APPLIANCES AT A DISTANCE OF 0.3 METER (1 FOOT)

Appliance 1	Electric Field (kV/m)	Magnetic Field (mG)
Coffee Maker	.030	1 - 1.5
Electric Range	.004	4 - 40
Hair Dryer	.040	0.1 - 70
Television	.030	0.4 - 20
Vacuum Cleaner	.016	20 - 200

Electric Blanket 2	.01 - 1.0	15 - 100

kV/m - kilovolts per meter
mG - milligauss
1 By 0.9 to 1.5 meter(s) (3-5 feet), the magnetic field from appliances is usually decreased to less than 1 mG.
2 Values are for distances from a blanket in normal use, not 0.3m (1 foot) away.

Sources for appliance data: Miller, 1974; Gauger, 1985.

TABLE 4.9-2
TYPICAL ELECTRIC AND MAGNETIC FIELD STRENGTHS FROM BPA OVERHeaD TRANSMISSION LINES

Transmission Lines	Electric Field (kV/m)	Magnetic Field (mG) Maximum1	Average 2
115-kV			
Maximum on Right-of-way	1.0	63	30
Edge of Right-of-Way	0.5	14	7
200 Feet From Center	0.01	1	0.4
200 Feet from Center			
230-kV			
Maximum on Right-of-Way	2.0	118	58
Edge of Right-of-Way	1.5	40	20
200 Feet from Center	0.05	4	2

kV/m - kilovolts per meter
mG - milligauss
1 Under winter peak load conditions (occurs less than 1 percent of the time).
2 Under annual average loading conditions.

Because public concern is increasing over potential health effects of electric and magnetic fields and because a clear course of action has not been determined from present scientific evidence, BPA has developed interim guidelines. These guidelines state that BPA should not increase public exposure to electric and magnetic fields where practical alternatives exist. Thus, it is BPA's practice to consider potential electric and magnetic field exposure increases in the design and location of new transmission facilities. Increases in long-term, involuntary exposures to these fields are avoided if practical alternatives exist.

4.10 TRAFFIC AND TRANSPORTATION

4.10.1 Regional Setting

The project site is approximately 19 kilometers (12 miles) south/southeast of the City of Tacoma and roughly 13 kilometers (8 miles) south/southwest of Puyallup. The study area contains a number of major arterials, including I-5 and State Routes 512 and 7. The western terminus of State Route 512 is at a junction with I-5, just south of Tacoma (Figure 4.10-1). This state route serves as a main arterial extending east from I-5, eventually becoming 107th Street East. The Chehalis Western Railroad passes approximately 0.4 kilometer (0.25 mile) north of the site.

Major streets in the vicinity of the site and on which the transportation analysis concentrated include State Route 512, 176th Street East, 192nd Street East, and Canyon Road, which traverses approximately 0.4 kilometer (0.25 mile) east of the site.

4.10.2 Local Transportation System

Immediate access to the site is from 192nd Street East, about 0.4 kilometer (0.25 mile) south of the site boundary. 192nd Street East is reached from Canyon Road and 38th Avenue. Canyon Road is primarily reached from State Route 512. 38th Avenue is reached from 176th Street East, which defines its most northern point. 192nd Street East is an urban, two-lane road with a minimal shoulder area. 38th Avenue is a shoulderless, narrow, two-lane urban road. 176th Street East is a two-lane urban road with a wide shoulder and designated right-turn lane onto Canyon Road. Canyon Road is a four-lane road with off-ramps and on-ramps connecting it with State Route 512. Canyon Road has a wide shoulder and four signalized intersections along its route from Route 512 to its southern terminus at 192nd Street East (112th Street East, 128th Street East, 160th Street East and 176th Street East). State Route 512 is a four-lane expressway. I-5 is an eight-lane freeway (four lanes in either direction) and the major arterial through Tacoma.

Figure (Figure 4.10-1 Transportation Study Area)

No paved or graveled roads cross or lead to the power plant site, although an unimproved dirt road skirts its western boundary. This road begins at 192nd Street East and follows the eastern boundary fence of the AMA Timber Products facility. The road continues north along the site perimeter to the Chehalis Western Railroad tracks. Paved roads surround the site and include Canyon Road, 184th Street East, 38th Avenue East and 192nd Street East. These roads serve as access to industrial facilities and as commuter corridors for vehicles traveling to or from Tacoma, Puyallup and the I-5 corridor.

4.10.3 Existing Traffic Volumes

Traffic flow for the project vicinity reflects commuter traffic into and out of the Frederickson area, which serves as a bedroom community for centers north of its location (e.g., Tacoma/Seattle). Existing peak-hour traffic volumes occur along established "commute corridors", such as Canyon Road and State Route 7 in a northbound direction during the morning (a.m.) and in a southbound direction during the evening (p.m.) (Boeing, 1991).

Roadway capacity is a function of traffic volumes and the physical characteristics of a road. In order to establish the setting for existing traffic conditions, average daily traffic (ADT) and peak-hour counts have been analyzed for roads in the study area that could be affected by traffic to and from the power plant. On Canyon Road north of Military Road, the ADT is 19,546 vehicles; south of Military Road, the ADT drops to 6,370 vehicles.

Roadway capacity is expressed in terms of Level-of-Service A through F. Table 4.10-1 shows ADT volumes for roads in the study area. When available, it also shows the Levels-of-Service for some roads, as well as traffic volumes during peak morning and evening hours.

The worst traffic congestion currently occurring within the study area is south bound on Canyon Road at its intersection with 112th Street East, just south of its junction with State Route 512, during afternoon peak-hour traffic. Studies performed in October 1992 indicate that this intersection operates at Level of Service "E" during the peak p.m. hour (Mike Shopshire, Pierce County, pers comm., March 26, 1993). The cause of congestion is people returning to the Frederickson Industrial Area at the end of the workday. There are plans by the County to upgrade Canyon Road and State Route 512 by widening portions of their routes and creating additional

designated turn lanes (Chris Beckman, Pierce County, pers. comm., March 19, 1993). Further improvements may be accomplished from an analysis of intersection signalization during the peak hours.

TABLE 4.10-1
TRAFFIC VOLUMES AND LEVELS-OF-SERVICE ON ARea ROADWAYS

Roadway Segment	Description	ADT (vpd)	Peak Hour Counts (vph) AM	PM	Level of Service Current	Construction
Canyon	North of Military	19,546	1,673	2,024	E	E
Canyon	South of Military	6,370	676	731	C	C
192nd	West of 38th	1,188	102	132	A	B
512	East of Canyon	46,900				
512	East of State Route 7	51,500				
180th	East of 40th	184	17	27		
176th	East of Canyon	12,091	992	1,151		
176th	West of Canyon	9,734	683	847		

Key

A
Free flow (relatively). If signalized, conditions are such that no approach phase is fully utilized by traffic and no vehicle waits through more than one red indication. Very slight or no delay.

B
Stable flow. If signalized, an occasional approach phase is fully utilized; vehicle platoons are formed. This level is suitable operation for rural design purpose. Slight delay.

C
Stable flow or operation. If signalized, drivers occasionally may have to wait through more than one red indication. This level is suitable operation for urban design purposes. Acceptable delay.

D
Approaching unstable flow or operation; queues develop but quickly clear. Tolerable delay.

E
Unstable flow or operation; the intersection has reached ultimate capacity; this condition is not uncommon in peak hours. Congestion and intolerable delay.

F
Forced flow or operation. Intersection operates below capacity. Jammed.

1 Source: Transportation Research Circular 212 - Interim Materials on Highway Capacity Analysis - Highway Research Board, January 1980.

Localized congested areas also occur along Canyon Road, especially during peak-hours at signalized intersections along its route. These areas are congested for roughly 10 to 15 minutes during peak traffic hours. The cause of this congestion is most likely the introduction of new industrial facilities in the Frederickson Industrial Area, such as the new Boeing plant (Mike Shopshire, Pierce County, pers. comm., March 26, 1993).

4.10.4 Growth Trends

In order to predict the effects of growth on traffic flow to the year 2010 Pierce County has been broken down into a series of traffic zones. In the 1990 census, the zone in which the proposed site is located had an estimated population of 1,622, or 0.26 percent of the total County. Predictions for the years

2000 and 2010 indicate that the population for this zone will increase to 2,615 and 3,529, respectively; or by roughly 1,000 people per decade. However, the total population would still be relatively low compared to other zones of similar size. Major traffic trends for this area are expected to be influenced primarily by large industries such as Boeing, which anticipates a total working population of 11,419 by the year 2010. The resident population, not all of which currently drives or would drive to work in the future, contributes a relatively small portion of the total number of vehicles.

4.11 ENERGY AND UTILITIES

4.11.1 Water Supply

Water would be supplied by TPU Water Distribution. An existing 51-centimeter (20-inch) diameter municipal water main is located about 427 meters (1,400 feet) from the proposed power plant site along 192nd Street East, and is available to provide water for the proposed project. TPU is investigating the future needs for water supply in the Frederickson area.

4.11.2 Sanitary Sewer

An existing 61-centimeter (24-inch) diameter sanitary sewer is located parallel to 192nd Street East, about 427 meters (1,400 feet) south of the proposed site. Currently there is a 162 meter (530 feet) extension of 25-centimeter (10-inch) sewer extending north from the existing 61-centimeter (24-inch) sewer line in 192nd Street East towards the subject property in the future proposed roadway identified as 50th Avenue East. Most likely, a new hookup would be installed to this 25 centimeter (10 inch) sewer, along 50th Avenue. The new hookup would be built according to Pierce County codes.

4.11.3 Storm Drainage

No storm water drainage facilities are known to exist around the proposed project site; natural drainage currently provides for the flow of runoff. The Pierce County Surface Water Management Department regulates storm water facilities for the county.

4.11.4 Solid Waste Disposal

The municipal solid waste landfill for Pierce County is operating under a 5-year extension from 1991. The landfill is operated privately by Land Recovery, Inc., and is in a siting process to acquire and develop the adjacent area.

4.11.5 Electricity

Electricity would be generated by the proposed project through the gas turbine-generator and the steam turbine-generator. Some of this energy would be used at the proposed project to operate plant power and lighting needs. The majority of the energy would be tied into BPA's South Tacoma substation.

During periods when the proposed generation facility would be off-line (not producing energy for BPA), power would be provided to the facility by a local utility power system. In the event that the power plant is shut down and utility power is also out of service, an emergency generator would connect a portable 100-kW/1250 megavoltamperes (mva), 480 volt, three-phase generator to the power plant's 480 volt system.

Power is available from the Puget Power 115-kV power line located along Canyon Road and 192nd Street East, and from Tacoma Public Utilities' 12.5-kV power line located along 38th Avenue. Power needs for meeting the proposed facility's auxiliary needs and for construction would likely be provided by TPU's transmission line. Initial start-up power to energize the proposed project would be provided through BPA's 230-kV transmission system (Mike Lebens, Tenaska, pers. comm., March 26, 1993).

A 110-kV transmission line is located in an easement corridor which skirts the western boundary of AMA Timber Products in a north/south orientation roughly 230 meters (750 feet) west of the proposed site. It is operated by TPU.

4.11.6 Natural Gas

Northwest Pipeline Corporation has a pipeline located about 305 meters (1,000 feet) from the property boundary. This pipeline would supply the natural gas to the proposed power plant.

4.11.7 Back-Up Fuel Oil

An emergency back-up supply of fuel oil would be stored on site. The fuel would be trucked to the site from commercial delivery points. Delivery points would vary based on price and availability of the fuel oil.

4.12 NOISE

4.12.1 Noise and Its Measurement

Noise is commonly defined as unwanted sound that disrupts normal human activities or diminishes the quality of the human environment. Transient noise sources, such as aircraft directly overhead or passing motor vehicles, are usually short duration noises and are often excluded from regulation. Stationary noise sources are emitted from fixed locations and are associated with a specific land use. Examples of stationary noise sources are ventilation fans, fabrication machinery, and water pumps. Ambient noise consists of all noise generated in the vicinity of a chosen location by typical noise sources, such as local traffic, wind blowing in trees, neighboring industries, and general aircraft traffic. The total noise level as measured with a sound level meter is composed of a typical mix of all sources, both distant and nearby, which form the ambient noise environment at the measurement location.

Noise is measured as a sound pressure level exerted on the microphone of a sound meter. The magnitude of audible sound

levels, decibels (dB), has a very wide range. Decibel measurement scales are based upon the logarithm, which is not linear, and consequently sound pressure levels from different noise sources cannot be added arithmetically. For example, a 70 dB sound added to another of equal magnitude will equal a sound of 73 dB, not 140 dB. Sound levels are adjusted (or weighted) by the sound meter for the variation in ear sensitivity and are reported as A-weighted decibels (dBA).

Noise levels also change with time. The following methods of averaging noise are commonly used to describe the noise environment and time-varying noise levels:

- Maximum sound pressure level (Lmax) - the highest sound pressure level observed during a measurement, either of the ambient noise or from a particular noise source.

- Statistical noise level (L10, L50, etc.) - for time-varying noise sources, the statistical sound levels describe how often a given sound level is exceeded during the period of the measurement. For example, L10 is the noise level exceeded 10 percent of the time, that is, not very often. The L90 noise level would be exceeded most of the time (90 percent of the time), and would represent the background noise level or lowest ambient noise levels of the noise environment. Particular, identifiable noise sources are additive to the background noise, forming the total noise environment.

- Equivalent sound pressure level (Leq) - the sound level of a steady, non-time-varying noise which is equivalent, in total acoustic energy, to the noise level of a time-varying noise. The Leq is measured over a specified period of time, usually one hour, and represents an average acoustic energy for that time period.

- Day-night noise level (Ldn) - the 24 hour equivalent level with a 10 dB penalty added during night hours (10:00 p.m. to 7:00 a.m.) to allow for greater community sensitivity to noise occurring at night. The Ldn is calculated from hourly Leq measurements.

4.12.2 Ambient Noise Levels

Noise measurements were made at the proposed Tenaska Washington II project site and on property surrounding the site where noise impacts would be likely to occur. Contributors to the ambient outdoor noise levels observed and measured at the site, and in the vicinity of the site, include distant aggregate mining activities, aggregate haul trucks along Canyon Road, Boeing plant noise, passenger and light-duty vehicles, aircraft, wind blowing
through trees, bird songs, and adjacent to 184th Street East, saw cutting and impulsive stapling noise at a pallet manufacturing plant.

The ambient measurements were made on February 20, 23, and 24, 1993, using a Bruel & Kjaer sound Level Meter Type 2231 and with a Larson/Davis Integrating Sound Level Meter Model 700. Short-term Leq measurements were typically made for approximately 10 to 15 minutes and averaged over that period of time by the meter. Measurement locations are shown in Figure 4.12-1.

Hourly Leq noise levels ranged from about 50 to 55 dBA during the day and 45 to 50 dBA at night. Nighttime levels were influenced by 16 kilometers per hour (10 miles per hour) winds and would probably be about 5 dB lower without the wind. The lowest ambient noise level observed was 44 dBA, which occurred at 7:30 pm. Noise levels are slightly higher than those that might be expected at a typical rural location because of the influence of military air traffic.

Figure (Figure 4.12-1 Noise Measurement Locations)

A sampling of the noise was made along Canyon Road, located at Site 6 in Figure 4.12-1, to determine the influence of truck and vehicle traffic on the noise environment of the project vicinity. Traffic volume for the segment of Canyon Road at the measurement site (M6) was estimated at 300 vehicles passing per hour. Approximately 40 percent of the vehicles were heavy trucks, based upon direct observation. At about 12 meters (40 feet) from the centerline of the nearest lane of traffic, the noise level was 63 dBA Leq. Daytime noise levels within approximately 300 meters (1,000 feet) of the road are dominated by traffic noise. The project site is about 365 meters (1,200 feet) from Canyon Road.

4.12.3 Noise Regulations and Guidelines

Local, state, and Federal noise regulations and guidelines protect residents and workers from excessive noise from neighboring activities. By Pierce County ordinance and state law (WAC 173-63), this project would be subject to maximum allowed levels of noise as measured at the property line of adjacent occupied land. The allowable noise level depends upon the land use designation of the property. For an industrial noise source, the allowed daytime noise level at neighboring industrial property, at the property line, is 70 dBA, and at residential property lines, 60 dBA. At night, the limits for residences are 10 dBA lower.

The noise descriptor most often used in estimating noise impacts is the equivalent noise level (Leq). The county and state noise regulations do not use the Leq to take into account the time-varying nature of typical noise sources. Instead, the regulations allow the noise level to exceed the stated maximum allowable for short periods of time. For most noise sources, the allowed increases to short-term noise levels can be approximated by allowing the predicted or measured Leq of the noise source to be 2 dBA higher. The noise limits for evaluating the Tenaska Washington II project, however, have been left unmodified, and therefore provide a slightly conservative basis for assessing noise impacts. Table 4.12-1 lists the allowable noise limits for the project:

TABLE 4.12-1
MAXIMUM PERMISSIBLE NOISE LEVELS
ADJUSTED FOR Leq AVERAGING

(dBA)

Noise Receiver	Daytime	Night
Residential	60	50
Industrial	70	70

Some noise sources are exempt from regulated limits. They include aircraft, railroads, vehicles operating on public roads, and temporary construction sites between the hours of 7:00 a.m. and 10:00 p.m.

The Federal Noise Control Act of 1972 gave each state the responsibility for noise control. Executive Order 12088 requires that Federal agencies such as BPA comply with state and local noise control regulations.

4.13 VISUAL QUALITY

The objectives of the visual resource baseline inventory were to identify, describe, and map all significant visual resources

which may be affected by the construction and operation of the proposed power plant and ancillary facilities. The baseline data were recorded in sufficient detail for assessment of direct and indirect impacts of the project. Although no public lands were directly affected, the visual resource study was conducted in compliance using Federal guidelines established by the Forest Service Visual Management System (FSM 2380) and SCS Priority Landscape System (Technical Release No. 65). These guidelines were used specifically to identify scenic or visually sensitive landscapes. Data sources included color aerial photography and U.S. Geologic Survey (USGS) topographic maps, supplemented by field reconnaissance and physiographic information described by Fenneman (1931).

4.13.1 Results

The characteristic landscape is relatively flat land, sloping slightly to the south, and edged to the northeast by a small ridge. Most of the original cedar, hemlock, and Douglas fir forest has been cleared. Small clusters of coniferous trees and individual stands of oak trees are scattered around the project area. Numerous physical modifications (Figure 4.13-1) have occurred to the landscape. Large tracts of land surrounding the project area have been and are being converted into industrial use. Major industrial modifications include an existing power generation plant and a cleared and graded area to the south; BPA's South Tacoma switching station to the northwest; a timber mill and manufacturing plant to the southwest; and a sand and gravel operation and wood storage yard to the east. A network of roads surrounds the project area. Several sets of transmission lines cross to the north, west and south of the project area. Two small residential areas, located to the northeast and northwest, are separated by a tree farm.

The scenic quality is enhanced by the background distance zone influence of Mt. Rainier located to the east/southeast of the project area. Mt. Rainier is one of the most visually dominant landforms of the Pacific Border physiographic province. The

Figure (Figure 4.13-1 Physical Modifications...)

scenic quality at the project site ranges from minimal to common with significant cultural modifications as described earlier. The visual sensitivity ranges from low to moderate for industrial locations and low to high for residential areas. This is based on general landscape appearance and maintenance of surrounding properties. The general view distance to the project site is foreground to middleground and ranging from 0.2 to 2 kilometers (0.1 to 1.5 miles). The view distance from Mt. Rainier National Park is about 37 kilometers (23 miles). The Visual Quality Objective (VQO) is mostly Modification with some Partial Retention. This objective allows project facilities and activities to visually dominate that landscape as viewed from certain locations (e.g., industrial locations). However, project facilities and activities should remain visually subordinate to the characteristic landscape from other viewing locations (e.g., residential areas).

Key observation points (KOPs) identified for the study area include residential areas located to the north of the proposed project, Canyon Road and 38th Avenue located respectively to the east and west of the proposed project. Other KOPs identified include vistas and overlooks oriented toward the proposed project area from Mt. Rainier National Park.

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 INTRODUCTION

This chapter describes potential impacts of the proposed project on the environment and the impacts of alternatives to the proposed project. A summary of these impacts by resource is provided in Table 5.1-1. Sections 5.2 through 5.13 describe the impacts of construction and operation of the proposed Tenaska Washington II project on various environmental elements. Each section begins with a statement of the method of analysis indicating how impacts were determined.

In most cases, mitigation measures designed to eliminate or lessen impact are suggested. A summary of significant and unavoidable impacts is contained in Section 5.15. Section 5.14 describes mitigation measures already planned for the project such as project design features intended to reduce environmental impacts. Other environmental summaries are contained in Sections 5.15 through 5.16. The cumulative impacts of the proposed action and other similar actions are described in Section 5.18. Environmental impacts of alternatives to the proposed action are described in Section 5.19.

The majority of impacts discussed below are associated with the proposed power plant. Unless otherwise stated in the text, impacts resulting from the transmission line and modifications to the BPA South Tacoma substation are minor.

Technical studies in support of the environmental analyses, other than the archaeology and noise studies, were performed by Woodward-Clyde Consultants. The archaeology study was performed by J. Scott King of Historical Research Associates, Inc., in Seattle, Washington. The noise study was performed by Michael R. Yantis Associates, Inc., of Bellevue, Washington.

5.2 GEOLOGY AND SOILS

5.2.1 Methods of Analysis

Geology and soil characteristics for the proposed site were determined by review of a number of sources including the SCS, Pierce County Soil Map; Geologic Maps from the Washington Department of Geology and Earth Resources; and several technical reports prepared by Brown and Caldwell, Earth Consultants, Inc., and Dames & Moore, all of which are referenced in Section 8.0 References.

TABLE 5.1-1 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

RESOURCE	COMBUSTION TURBINE	TRANSMISSION LINES	SUBSTATION
Geology and soil Soils	Minor increase in soil erosion during construction.	Minor increase in soil erosion during construction.	Minor increase in erosion during construction.
Hydrology and Water Quality	Slight increase in runoff volume which would be contained on site.	None.	Slight increase in runoff volume.
Air Quality	Power plant would emit air pollutants, but at levels in compliance with applicable air quality and visibility standards and air toxic acceptable levels. Emission of greenhouse gases (primarily CO2). Emission	Emission of dust and engine exhaust during construction.	Emission of dust and engine exhaust during construction.

	of dust and engine exhaust during construction.		
Biology	Removal of some vegetation and already disturbed wildlife habitat at 6.4-hectare (16-acre) site. The Aster curtus, a state sensitive and Federal Candidate 2 plant species, would be transplanted on site and seeds would be gathered.	Wildlife expected to migrate from disturbed area during construction and return thereafter.	Removal of vegetation from less than 0.1 hectares (0.2 acres). Wildlife expected to migrate from disturbed area.
Land Use and Community Character	None. Plant would lie in area zoned for industrial use.	None.	None. Improvements would take place with an existing switching station.
History and Archaeology	None expected.	None expected.	None expected.
Socioeconomics and Local Services	Project would create 25 to 30 permanent jobs and 225 to 250 construction jobs.	None.	Project would create 10 to 15 construction jobs.
Public Health and Safety	Hazardous substances used during construction and/or operation could be spilled and released to environment. Mitigations and spill contingency plans are proposed by applicant.	Lines, particularly overhead, could pose electric shock hazard and increased electric and magnetic fields.	None.
Traffic and Transportation	Construction workers would generate an estimated 60 truck trips and 215 vehicular trips per day. Operation would generate roughly 30 vehicular trips per day.	Minor.	Minor.
Energy and Utilities	Plant would be serviced by existing utilities. Plant would produce 240 aMW of electrical energy.	None.	None.
Noise	Permanent increase in noise from project operation, but in compliance with applicable standards. Temporary noise increase during construction.	Temporary noise increase during construction.	Temporary noise during construction.
Visual Quality	Alteration of visual quality in Frederickson. Appearance would be consistent with industrial surroundings.	Aboveground transmission line, if chosen, would have adverse effect on visual quality, but would be consistent with industrial surroundings.	Minor.

5.2.2 Impacts and Mitigation Measures

Impact G1 Construction and operation of the Tenaska Washington II project could preclude the use of geologic resources at the site.

Impacts

There are no known unique geologic features or mineral resources that could be affected by this project. Due to their suitability for urban development, much of the area underlain by Spanaway soil is being converted to urban uses. Remaining areas are used primarily for hay production and pasture. This soil is moderately productive under good management conditions, but is not prime farmland (SCS, 1979).

Mitigation Measures

No mitigation measures are suggested.

Impact G2 Geologic conditions at the Tenaska Washington II project site could threaten the stability of structures at the site.

Impacts

Based on past records and current research regarding seismic events in the region, ground-shaking is possible in the project area. Site-specific engineering and geotechnical studies would be necessary prior to project construction to assess structural stability. Structures, including both the power plant and associated transmission lines, should be designed to conform with the building standards for seismic risk in the project region and the recommendations of the geotechnical engineer.

Mitigation Measures

No mitigation measures are suggested beyond those built into the project.

Impact G3 Construction of the Tenaska Washington II project could cause soil erosion.

Impacts

Short-term construction impacts would consist of ground-disturbing activities including topsoil exposure. Erosion would probably be minor for this project due to the relatively gentle slopes, permeable soils and lack of proximity to surface water drainages.

Mitigation Measures

The following mitigation measure is suggested:

G3-1 To minimize erosion, control measures could be applied to all exposed areas during and following construction. During construction, incorporation of standard erosion control measures such as silt fencing, straw bales, and temporary seeding serves to minimize erosion. Once construction is completed, landscaping of exposed areas stabilizes soil and serves an aesthetic purpose as well. The Storm Water Management Manual for the Puget Sound Basin (Ecology, 1992) contains several recommendations concerning erosion control.

5.3 HYDROLOGY AND WATER QUALITY

5.3.1 Methods of Analysis

Methods used for the analysis of this section were based upon the results of previous studies, the project description, and discussions with Pierce County and the State. Previous studies were used to determine runoff characteristics, the infiltration capacity of the soils, and other features of the area that would have an effect on hydrology and water quality. Tenaska was consulted to determine how the construction and operation of the proposed project would impact hydrology and water quality. Pierce County and the Washington DOE were consulted to address the regulatory guidelines and policies affecting hydrology and water quality. References used for this section are shown in Section 9.0.

5.3.2 Impacts and Mitigation Measures

Impact HY1 The proposed project could alter rates of storm water runoff and infiltration into the groundwater system.

Impacts

Soils at the proposed Tenaska Washington II project site are very permeable. At present, much of the rainfall falling on the site is intercepted by vegetation and evapotranspirates or percolates into the soil. Runoff occurs only during the heaviest precipitation. Development of the Tenaska Washington II project site would have a negligible effect on the rates of storm water runoff and infiltration. Vegetation would be cleared from a portion of the site and replaced with approximately 1.2 hectares (3 acres) of impervious surfaces, such as building roofs and concrete and asphalt paving. Neither the substation modifications nor any transmission towers would substantially add to the area of impermeable surface.

Tenaska filed a Notice of Intent for coverage under Storm Water Baseline General Permit with Washington DOE on August 2, 1993. Washington DOE determined that operation of the facility will not require National Pollution Discharge Elimination System (NPDES) storm water permitting. An NPDES permit will be obtained for construction. A preliminary storm water pollution prevention plan has been developed by Tenaska.

However, management plans to reduce runoff from pollutant sources will be addressed in the storm water management plan for the proposed facility, which would be submitted to Pierce County for approval. The plan would be reviewed under Pierce County's Aquifer Recharge Area Ordinance and the Site Development Ordinance. The Aquifer Recharge Area Ordinance pertains to protection of the Clover-Chambers Creek Aquifer. The storm water management plan would be consistent with the Washington DOE's Puget Sound Water Quality Management Program (PSWQMP) guidelines for best management practices (1991).

Precipitation falling on impervious and semi-impervious surfaces would be collected and routed to a retention-infiltration system. The drainage system would consist of two parts: a building roof drain infiltration system, and a bioswale and retention-infiltration pond for the remainder of the site. The fuel storage area will be lined with impervious material. Precipitation from the fuel storage area will be checked for oil content and either routed to the oil-water separator, if necessary, or to the bioswale and infiltration pond for disposal. The two components of the system would be designed to avoid runoff from the site except during an event larger than the 100-year return frequency storm. The net effect of development of the site would be negligible alterations in infiltration and runoff rates. As is the case at present, virtually all precipitation falling on the site would evaporate or percolate into the subsurface.

Mitigation Measures

No mitigation measures are suggested beyond those already built into the project.

Impact HY2 Operation of the proposed project could increase the discharge of water pollutants.

Impacts

Plant operations would generate a variety of wastewaters including process wastewater, cooling water blowdown, sanitary wastewater and potentially-polluted storm water runoff. The wastewater management system at the plant would be designed to route all polluted waste streams to the sanitary sewer. Unpolluted storm water runoff would be routed to an infiltration system.

Polluted and potentially-polluted waste streams from plant operations would be routed to a wastewater sump. Water from the wastewater sump would be combined with cooling tower blowdown and discharged to the Pierce County sanitary sewer. Sanitary wastes would be discharged directly to the Pierce County sanitary sewer. Approximately 380,000 liters/day (100,000 gallons/day) would be discharged from the proposed project to the Pierce County sewer system. The wastewater stream would be lightly polluted because most of it would be cooling tower blowdown. Cooling tower blowdown would contain salts and possibly traces of chemicals used to control algal growth in the towers. The discharged wastewater would meet all of the volume and effluent quality requirements of the Pierce County Utilities Sanitary Sewer System and would not affect Pierce County's ability to meet its own discharge limits. Additional wastewater treatment or volume reduction is not needed.

Process equipment and floor drains within buildings would be routed directly to the wastewater sump. Exterior process equipment areas, and other exterior areas that could be potentially subject to oil spills, would be paved and surrounded by a curb to contain spills or storm water runoff. Drainage from the curbed area would be routed to an oily water sump and then to an oil-water separator. After oil is removed, the remaining wastewater would be routed to the wastewater sump. Interior and exterior areas, potentially subject to chemical contamination would also be paved and curbed. Any drainage or spillage from these areas would be routed to a chemical waste sump. The contents of the chemical waste sump would be pumped to a neutralization tank where it would be blended with wastewater from the demineralizer. Neutralized chemical wastewater would be routed to the wastewater sump.

Storm water runoff from portions of the site with very little or no potential for oil or chemical spills would be collected and routed to groundwater infiltration systems. Less than 10 percent of the storm water runoff at the site would be routed to the sanitary sewer system as described above. Roof drains would be connected to several separate infiltration systems. Unpolluted storm water runoff from the rest of the site would first be directed to a bioswale, and then to a retention and infiltration pond. Retained storm water would either percolate into the ground through the bottom of the pond or evaporate. The infiltration capacity of the pond would be increased by the installation of a perforated pipe in the subsoils under the pond.

The Tacoma-Pierce County Health Department requires submittal of a hydrogeological assessment to determine the potential impact to groundwater resources (see Section 4.3.1). A copy of the hydrogeological assessment has been submitted by the project developer to Tacoma-Pierce County Health Department for review and approval. Any additional mitigation measures above those identified in the assessment will be incorporated into the project to comply with the requirements as determined by Tacoma-Pierce County Health Department. See Section 5.11.2, "Impact EU1", for further discussion of water supply.

Drainage from the diked area surrounding the fuel oil tank would be handled separately. The diked area would be equipped with an impervious liner. Drainage from within the diked area would be conveyed to a sump equipped with a valve. The valve would normally be kept in the closed position and any drainage would accumulate in the sump. Periodically the contents of the sump would be sampled. If oil is present the accumulated liquid would be directed to the oil-water separator. After oil is removed the remaining water would be conveyed to the wastewater sump and hence to the sanitary sewer. If the drainage in the sump is free of oil it would be drained to the bioswale and infiltration system.

As previously stated, the storm water management plan for the proposed facility would be submitted to Pierce County for approval, and would be consistent with the Washington DOE's PSWQMP guidelines for best management practices (1991).

Mitigation Measures

No mitigation measures are suggested beyond those built into the project.

Impact HY3 Construction of the proposed project could increase the discharge of water pollutants.

Impacts

Water quality impacts would be the greatest during the initial construction phase due to excavation, grading, and movement of construction vehicles on unpaved surfaces. During construction, an additional 2 hectares (5 acres) that the project will ultimately occupy would be required for construction activities. Increased erosion from unprotected soil has the potential to increase the amount of sediment carried by storm water runoff. This sediment can carry contaminants from construction equipment into the groundwater system, which would be rapidly transported through the permeable soils without proper preventative measures described below.

Mitigation Measures

HY3-1 Storm water runoff could be controlled in a manner which would limit erosion, such as by use of hay bales, sandbags, or other temporary sediment fences. Equipment and machinery used during construction could be kept covered with a waterproof tarp to prevent contamination from rainfall runoff.

HY3-2 Construction practices could be timed so that the initial phases occur during periods of little rainfall (i.e., summer).

HY3-3 Tarps or other protection could be placed over equipment when not in use, and construction supplies could be kept in a covered area.

HY3-4 Fuel and oil used during construction could be stored in tanks that are mounted above ground over impermeable surfaces.

The TPU Water Division will request that the Tacoma-Pierce County Health Department impose, under authority of Pierce County Code Chapter 21.16 (Aquifer Recharge Areas), monitoring requirements and other appropriate mitigation measures necessary to protect groundwater quality. A copy of the hydrogeological assessment has been submitted to Pierce County Health Department for review and approval. Any additional mitigation measures above those identified in the assessment will be incorporated into the project to comply with their requirements.

5.4 AIR QUALITY

5.4.1 Methods of Analysis

Project-related air emissions were examined with reference to State and Federal emission limits. In Washington State, implementation of the Federal Clean Air Act has been delegated to the Washington DOE. In the project area, responsibility for implementation has been delegated to the PSAPCA.

The Tenaska Washington II project would have to operate in accordance with permit conditions established by the PSAPCA. A permit application was filed by Tenaska in December 1992 ("Notice to Construct, Application Tenaska Washington II Generation Project, Frederickson, Washington," Tenaska Washington Partners II, L.P., 1992). The application was reviewed by PSAPCA and submitted for agency and public comment on August 11, 1993. No comments were received by PSAPCA (Jay Willenburg, PSAPCA, pers. comm., September 15, 1993). The supporting technical analyses performed for the permit application are the basis for much of the discussion in this section of the eis. Excerpts from the Notice to Construct Application can be found in Appendix G.

The PSAPCA, as part of its New Source Review procedures, has established threshold criteria that define numerically what the agency considers to be a significant impact. The threshold criteria and other pertinent regulatory requirements are discussed in Section 4.4.3. The following paragraphs discuss whether or not the proposed project would meet these numerical threshold criteria and other applicable air quality standards. The EPA-approved ISCST2 dispersion model was used to compare ambient air pollutant concentrations which would result from the proposed project with applicable standards and threshold criteria.

To assess the potential for cumulative impacts, proposed new sources (i.e., not part of the baseline) in the region were reviewed with PSAPCA and Washington DOE; none have been permitted within the project's significant impact area. Unless permitted, proposed sources cannot be included as "real" in cumulative impacts. Because there are no other projects competing for this airshed, significant cumulative impacts are not anticipated with this project. Existing sources, such as the "peaker" power plant nearby, are already included in the baseline that was used to assess project impacts. Thus, including the peaker in cumulative impacts would be to double-count its impacts.

5.4.2 Impacts and Mitigation Measures

Impact AQ1 Operation of the Tenaska Washington II power plant could adversely affect air quality.

Impacts

Emissions from the proposed project. There would be two sources of air contaminant emissions at the power plant: the exhaust from the combined cycle gas turbine, and the oil storage tank. Emissions from the turbine exhaust stack would be minimized by the use of control systems: a selective catalytic reduction system to reduce NOX in the exhaust gases, and an oxidation catalyst to lower CO and VOC emissions. The temperature of gases emitted from the air emission stack range from about 93yC (200yF) to 132yC (270yF). The gaseous emissions would not be visible. The oil storage tank would be painted white to minimize heating by the sun and consequent evaporative emissions. Evaporative emissions of VOC from the oil tank, at approximately 23 kilograms per year (50 pounds per year), would be very small relative to the turbine stack. (See Appendix G, Supporting Data for Emission Calculations, page 1. Also see revised emissions data for particulate matter in Tenaska's December 3, 1993, letter to PSAPCA in Appendix G.)

The character of the emissions from the turbine stack would depend on the type of fuel being burned. Specific contaminant emissions would include NOX, CO, SO2, VOC and particulates. Emissions of all contaminants would be greater when oil is the fuel. The estimated maximum hourly emissions are shown in Table 5.4-1. They are based on the manufacturer's guaranteed emission levels which are, in turn, based on source tests at similar facilities. (See Appendix G, Emission Calculations, Attachments 3 and 4.) Estimated annual average emission rates are shown in Table 5.4-2. It is assumed that the plant would operate for 97.3 percent of the time. Tables 5.4-1 and 5.4-2 reflect the emission limits currently stated in the air permit for the project issued by PSAPCA.

TABLE 5.4-1

ESTIMATED MAXIMUM POTENTIAL HOURLY EMISSIONS FROM TENASKA WASHINGTON II PROJECT

Pollutant	Maximum Hourly Emission Rate Kg/hr (lbs/hr) No. 2 Oil Firing	Natural Gas Firing
NOx	29.7 (65.5)	10.8 (23.8)
SO2	42.0 (92.5)	5.4 (12.0)
CO	10.4 (23.0)	10.3 (22.8)
VOC	7.0 (15.4)	5.3 (11.7)
Particulates	37.5 (82.6)	8.34 (18.4)
PM10	37.5 (82.6)	8.07 (17.8)

Note:
Maximum hourly emission rates for NOx and SO2 will occur at low ambient temperature. NOx and SO2 emission rates are based on -6 Cy (20yF) ambient temperature and 300 MMBtu/hr duct firing. Maximum hourly emission rates for CO, VOC, particulates, and PM10 will occur during warm summer days 26 Cy (80yF) ambient temperature and 430 MMBtu/hr duct firing. Peak emission rates occur when firing No. 2 fuel oil, which will be limited to 120 hours per year.

TABLE 5.4-2
ESTIMATED ANNUAL AVERAGE EMISSION FROM TENASKA WASHINGTON II PROJECT

Pollutant	Annual Avg. Emission Rates metric tons/year (tons/year)
NOx	89.7 (98.9)
SO2	49.3 (54.3)
CO	82.7 (91.2)
VOC	33.5 (36.9)
Particulates	90.9 (82.4)
PM10	88.1 (79.9)

Note:
The estimated annual average emissions are based on 120 hours operation on No. 2 fuel oil at -6 Cy (20yF) ambient temperature and 8,400 hours operation on natural gas at 10 Cy (50yF) ambient temperature. Both cases include 300 MMBtu/hr duct firing on natural gas, which is the maximum annual average duct firing rate. The 120 hours operation on No. 2 fuel at -6 Cy (20yF) ambient temperature represents the worst-case emission condition; the 8,400 hours operation on natural gas at 10 Cy (50yF) ambient temperature represents average case emission conditions near average annual ambient temperature. Total gas turbine use is limited to 8,520 hours per year, or a 97.3 percent annual utilization factor. The estimated annual average emission rate is equivalent to the maximum potential emissions, because the power plant will be limited by permit to 8,520 hours per year.

Tenaska indicates that the plant would function on a full-time basis but would be shut down for servicing for slightly less than 240 hours per year or just less than 3 percent of the total hours in a year.

It is also assumed, in the emission calculations, that the Tenaska Washington II power plant would burn natural gas for all but 120 hours each year when fuel oil could be used (the annual limit for fuel oil use). In fact, the plant would always burn natural gas unless gas supplies become unavailable. If the gas supply pipeline becomes inoperable, then the plant would switch to its back-up supply, fuel oil. Tenaska's permit from PSAPCA will designate the amount of time fuel oil can be burned. Tenaska operates several plants in Texas similar to the Tenaska Washington II project. To date, these plants have never needed to operate on their back-up fuel.

Vehicular/equipment engine exhaust emissions will be minor and temporary during construction. Air quality impacts will be temporary during construction. The project will not generate significant vehicle trips compared to the existing traffic levels in the area. Vehicular and equipment exhaust emissions during project operations will, thus, have a minor incremental/cumulative impact locally and regionally.

Compliance with emission standards for stationary gas turbines. Stationary gas turbines are subject to certain Federal emission standards for NOX and SO2. The standards are referred to as NSPS and would apply to the Tenaska Washington II project. The type of turbine planned for the Tenaska Washington II project would emit less than 10 percent of the NOX allowable

under NSPS. (See Appendix G, Emission Calculations.) The SO2 standard is expressed as a maximum sulphur content in the fuel to the turbine of 0.8 percent by weight. The sulphur content of No. 2 fuel oil is expected to be 0.05 percent by weight. The sulphur content of natural gas would be even less. It is unlikely that such low emission levels of NOx and SO2 would impact human health. Thus, the Tenaska Washington II project would comply fully with the NSPS. The emission controls proposed for the power generation facility meet or exceed current BACT. The high-efficiency selective catalytic reduction unit proposed to control nitrogen oxide emissions to 3 ppm is more efficient than devices recently determined to be BACT for similar sources in Washington and it achieves control levels specified in very stringent LAER (lowest achievable emission rate) determinations in other states. Furthermore, the oxidation catalyst proposed to control CO emissions will also reduce VOC emissions. It satisfies BACT requirements, as determined by PSAPCA.

Compliance with ambient standards. As noted earlier, the project area is not in compliance with ambient standards for CO and ozone. The Tenaska Washington II power plant's air pollution control consultant has compared the proposed plant's expected emission levels of CO and VOC and their expected impacts with the PSAPCA's significant impact threshold criteria for nonattainment areas for these contaminants. The results of the comparison are shown in Table 5.4-3.

TABLE 5.4-3
ESTIMATED MAXIMUM POTENTIAL EMISSIONS AND IMPACTS
ON NONATTAINMENT POLLUTANTS
TENASKA WASHINGTON II PROJECT

Pollutant	Averagings Time	Emissions metric tons/yr (tons/yr)	Maximum Project Impact (yg/m3)	PSAPCA Significant Emissions Thresholds metric tons/yr (tons/yr)	PSAPCA Significant Impact Thresholds (yg/m3)
CO	Annual	82.7 (91.2)		90.7 (100)	
	8-hr		3.0		500
	1-hr		15.0		2000
VOC	--	33.6 (37.0)	--	36.3 (40)	--

Notes: CO and ozone are non-attainment pollutants. VOC is considered for ozone non-attainment. Significant impact thresholds were established by the Puget Sound Air Pollution Control Agency as part of their New Source Review process pursuant to the Clean Air Act. PSAPCA has formally recognized NOX as an ozone precursor in its recently revised air regulations and attainment plans for this marginal non-attainment area for ozone. NOX is not included in this table because PSAPCA has confirmed the project as a "minor" source of NOX in its proposed permit for the project.

For CO emissions, the threshold emission criterion for new sources in nonattainment areas is 90.7 metric tons per year (100 tons per year). The Tenaska Washington II project would emit 82.7 metric tons per year (91.2 tons per year) of CO. The threshold emission criterion for ozone is expressed in terms of VOC rather than as ozone itself. VOCs, unburned hydrocarbons (excluding methane and ethane) in automobile exhaust for example, contribute to a complex chain reaction in the atmosphere that increases ozone concentrations. The threshold emission criterion for VOC is 36.3 metric tons per year (40 tons per year). Estimated emissions from the Tenaska Washington II project would be 33.6 metric tons per year (37 tons per year). In addition, CO and VOC emissions from the Tenaska Washington II project would not be expected to adversely affect human health.

The region is not in attainment of the 8-hour ambient standard (10 micrograms per cubic meter [yg/m3]) for CO. The project's maximum CO impact under worst-case meteorological conditions has been found to be well below EPA/Washington DOE significant impact thresholds for CO, as reported in Section 5.4.2 (see Table 5.4-3 and Appendix G). PSAPCA's threshold criterion for a significant impact to ambient air quality in a nonattainment area for CO is approximately 500 yg/m3 (0.0002 pounds per cubic foot) during an 8-hour period and about 2,000 yg/m3 (0.0007 pounds per cubic foot) during a 1-hour period. This threshold criterion applies to ambient air at any point outside the proposed facility where a member of the public could come into contact with air containing contaminants from the power plant. To compare expected impacts with these threshold

criteria, Tenaska's consultant used the ISCST2 computerized mathematical model that simulates dispersion of air pollutants. The model was developed and approved by the EPA and is discussed in Appendix G, Part 6. The maximum estimated concentration of CO in an 8-hour period is about 3 yg/m3 (1.1 x 10-6 pounds per cubic foot). The maximum estimated concentration in a 1-hour period is about 15 yg/m3 (5.3 x 10-6 pounds per cubic foot). These estimated concentrations are far below the threshold criterion for significant impacts to ambient air quality as shown in Table 5.4-3.

Sulfuric acid mist emissions of 4 kilograms/hour (9 lbs/hr) have been estimated by the turbine manufacturer while burning fuel oil. For emergency operation purposes, we have included up to 120 hours of back up fuel oil use per year; this equates to approximately .45 metric ton/year (0.5 ton/year) of emissions. This level is well below the EPA/Washington DOE prevention of serious deterioration regulations (PSD) significant emission threshold of 6.35 metric tons/year (7 tons/year). Modeled maximum 24-hour impacts (worst-case dispersion assumed to occur the same time as fuel oil use) equal 0.43 yg/m3, which is well below the Washington ASIL of 3.3 yg/m3 for this compound. Thus emissions and impacts will be insignificant. Furthermore, this predicted amount of sulfuric acid mist emissions is not anticipated to contribute significantly to acid rain in the project region. No existing or proposed nearby sources are known to significantly contribute to local impacts for this pollutant; thus, cumulative impacts are also expected to be insignificant.

The Tenaska Washington II project would be below the PSAPCA's significant impact threshold criteria for both emissions and ambient air quality. Thus, the proposed project would not cause or significantly contribute to existing nonattainment problems in the area and would not impair the area's ability to come into compliance with ambient air quality standards at some time in the future. No additional emission reduction equipment or offsets would be necessary.
The Tenaska Washington II power plant was also modeled for the effects of the project on ambient levels of NO2, particulates, PM10 and SO2. The project area is currently in compliance with air quality standards for these contaminants. Particulate concentrations are measured as TSP and PM10. PM10 are particulates with a diameter of less than 10 microns. The results are shown in Table 5.4-4. In all cases predicted concentrations are below the Washington State and Federal Ambient Air Quality threshold standards and would not be expected to have adverse effects on human health.

TABLE 5.4-4
ESTIMATED MAXIMUM IMPACT FOR ATTAINMENT POLLUTANTS
TENASKA WASHINGTON II PROJECT

Pollutant	Averaging Time	Maximum Project Impact (yg/m3)	PSAPCA Significant Impact Thresholds (yg/m3)
NO2	Annual	0.0	1
TSP	24-hr, highest	2.1	5
	24-hr, highest, second high	1.0	--
	Annual	0.0	1
PM10	24-hr, highest	2.1	5
	24-hr, highest, second high	1.0	--
	Annual	0.0	1
SO2	1-hr	58.5	--
	3-hr, highest	20.3	25
	3-hr, highest, second high	13.0	--
	24-hr, highest	4.4	5
	24-hr, highest, second high	2.0	--
	Annual	0.0	1

Notes: Maximum emissions used in the impact estimates are based on: continuous fuel oil firing for 1-, 3-, 8-, and 24-hour periods; weighted annual average fuel oil and gas use for annual emissions (oil = 120 hours; gas = 8,400 hours).

Significant impact thresholds were established by the Puget Sound Air Pollution Control Agency as part of their New Source Review process pursuant to the Federal Clean Air Act as amended.

Another set of state and Federal regulations apply to areas that already meet the Federal ambient air quality standards. These regulations are designed to prevent unacceptable degradation in areas that have good or excellent air quality. The regulations are referred to as the prevention of significant deterioration (PSD) regulations, and apply to projects that will emit or have the potential to emit more than 90.7 metric tons per year (100 tons per year) of any air pollutant. As a result of emission controls and fuel use limitations in the PSAPCA permit, the project's emissions will not exceed the 90.7 metric tons per year (100 tons per year) for any PSD pollutant. Thus, the project will be a "synthetic minor" source and PSD permitting will not be required for the Tenaska Washington II project. However, because the project would be located near an area that is sensitive to air quality changes, Mount Rainier National Park, Tenaska has conducted the analyses similar to those required under the PSD regulations. The results are shown in Table 7-4, Appendix G. The proposed project would not cause changes in ambient air quality any greater than that allowed under the PSD regulations. Also see Tenaska's December 3, 1993, letter to PSAPCA (Table 4) in Appendix G.

Compliance with standards for air toxics. Based on the chemical characteristics of the natural gas that would be burned at the proposed power plant, the emissions of substances listed as toxic air pollutants can be estimated. Estimated toxic air pollutant emissions are shown in Table 5.4-5. The ISCST2 air pollutant dispersion model was used to estimate ambient air quality concentrations of toxic air pollutants. Table 5.4-6 compares estimated concentrations resulting from operation of the proposed power plant with the applicable standards. In all cases the concentrations resulting from power plant operation are far below the standards. Similar estimates were made for the condition when the power plant would use oil as fuel. Again, the concentrations resulting from power plant operations would be below the applicable standards (Appendix G, Part 7). With either fuel, the air toxic emissions would not have an adverse impact on human health.

The proposed plant would also emit some ammonia from the stripping equipment used to control air pollutant emissions. Ambient ammonia concentrations resulting from power plant operations were modeled using the ISCST2 dispersion model and would be below applicable standards as shown in Table 5.4-6. The modeled maximum one-hour impact is 0.03 ppm (19 yg/m3), which is well below the odor threshold. Because the ammonia concentrations would not be detectable as an odor, would fall below Washington DOE's ASIL for individual projects, and because there are no known significant sources of ammonia emissions nearby, cumulative impacts are expected to be insignificant.

Mitigation Measures

No mitigation measures are suggested beyond those already built into the project.

Impact AQ2 Construction of the Tenaska Washington II power plant could adversely affect air quality.

Impacts

Air pollutants would be emitted from the exhaust systems of construction vehicles and equipment and from vehicles used by construction workers to commute to the site. The amount of pollutants emitted in this way would be small compared to total vehicular emissions in the Tacoma area. It is not expected that construction-related emissions would result in any violation of air quality standards.

TABLE 5.4-5
ESTIMATED EMISSIONS OF TOXIC AIR POLLUTANTS
NATURAL GAS FIRING OF TENASKA WASHINGTON II PROJECT

TAP	Estimated Emissions Kg/hr (lb/hr)
Isomers of Hexane	0.011 (0.025)
N-Butane	0.570 (1.257)
N-Pentane	0.074 (0.163)
Hexane	0.011 (0.025)
Heptane	0.011 (0.025)
Octane	0.011 (0.025)
Nonane	0.006 (0.013)

Cyclopentane	0.011 (0.025)
Cyclohexane	0.006 (0.013)
Methycyclohexane	0.011 (0.025)
Formaldehyde	0.462 (1.018)
Acetaldehyde	0.017 (0.038)
Isomers of Xylene	0.011 (0.025)
Benzene	0.063 (0.138)
Toluene	0.023 (0.050)
Ethylbenzene	0.006 (0.013)
O-Xylene	0.006 (0.013)
M-Xylene	0.006 (0.013)
1,3,5-Trimethylbenzene	0.011 (0.025)
1,2,4-Trimethylbenzene	0.006 (0.013)
1,2,3-Trimethylbenzene	0.006 (0.013)
Ammonia	13.6 (30.0)

Note: Non-methane/non-ethane compounds contained in total project VOC emission estimate.

TABLE 5.4-6
PREDICTED MAXIMUM AIR TOXIC IMPACTS FROM NATURAL GAS FIRING OF TENASKA WASHINGTON II PROJECT

Exceedance Toxic Air Pollutant	Typea	Toxic Impacts (yg/m3)	WA DOE ASIL (yg/m3)	(Yes/No)
Isomers of Hexane	B	0.00120	5994	N
N-Butane	B	0.05978	6327	N
N-Pentane	B	0.00777	5994	N
Hexane	B	0.00120	599.4	N
Heptane	B	0.00120	5328	N
Octane	B	0.00120	4825.5	N
Nonane	B	0.00060	3496.5	N
Cyclopentane	B	0.00120	5727.6	N
Cyclohexane	B	0.00060	3496.5	N
Methycyclohexane	B	0.00120	5328	N
Formaldehyde	A	0.00101	0.077	N
Acetaldehyde	A	0.00004	0.45	N
Isomers of Xylene	B	0.00120	1448.5	N
Benzene	A	0.00014	0.12	N
Toluene	B	0.00239	1248.8	N
Ethylbenzene	B	0.00060	1448.6	N
O-Xylene	B	0.00060	1448.6	N
M-Xylene	B	0.00060	1448.6	N
1,3,5-Trimethylbenzene	B	0.00120	416.3	N
1,2,4-Trimethylbenzene	B	0.00060	416.3	N
1,2,3-Trimethylbenzene	B	0.00060	416.3	N
Ammonia b	B	1.41	59.9	N
			59.9	N

a Type A carcinogen, annual average
Type B non-carcinogen, 24-hour average
Type D Federal CAA listing, but not in WAC 173-460

b Ammonia slippage results from the use of emission control equipment rather than combustion.

Particulate matter (dust) would be generated by grading, excavation and the movement of construction vehicles. It is not possible to accurately estimate the particulate concentration that might occur at the Tenaska Washington II power plant site because it is dependent on meteorological conditions and soil moisture. Measurements made during construction of apartments and shopping centers in the southwestern United States indicate that approximately 1 metric ton (1.2 tons) of dust are emitted per 0.4 hectare (per acre) per month of construction activity (U.S. Environmental Protection Agency, 1985). The higher humidity experienced in the Tacoma area would likely reduce dust emissions at the project site below the levels measured in the Southwest. Nevertheless, Federal and state ambient standards for particulates could be exceeded under some circumstances.

Mitigation Measures

The following mitigation measures would reduce the impacts of construction on air quality:

AQ2-1 The construction contractor could water all exposed soil surfaces twice each day during dry weather. Frequency of watering could be increased on days when wind speed exceeds 24 kilometers per hour (15 miles per hour).

AQ2-2 Stored construction materials that could be a source of dust could be covered.

AQ2-3 Vehicle and equipment engines could be turned off when not in direct use to reduce exhaust emissions.

AQ2-4 Vehicle speeds in the construction area could be limited to minimize dust in the area.

AQ2-5 Truck beds could be covered when they are transporting dirt/soil.

Impact AQ3 Project construction and operation could contribute to carbon dioxide (CO2) emissions.

Impacts

As a combustion process, the proposed project would emit CO2 during both the construction and production phases. As noted in Section 4.4.4, some scientists believe that increased atmospheric CO2 is leading to a global warming effect. If, in fact, this hypothesis is correct, then the project would contribute to CO2 emissions and to global warming.

Mitigation Measures

AQ3-1 Sequestration of carbon is a mitigation measure.

Currently, there are no regulations restricting CO2 emissions from any type of source. Tenaska, however, has implemented a voluntary program and has committed funds towards effective carbon sequestration projects in an effort to help offset CO2. Actions being considered by Tenaska take the form of "control offsets" where one action offsets the contribution of another action. Among the many strategies being researched for possible use for carbon offsets are biotic measures, which encompass such approaches as slowing or suspending the loss of existing forests (forest preservation), creation of new biomass storage (afforestation, reforestation, plantations), and increasing carbon stored in nonliving reservoirs (enhanced soil fertility).

Tenaska has retained the services of a leading authority on carbon mitigation and offset strategies to assist them in developing and analyzing viable options. Tenaska believes that some type of carbon forestry program makes the most sense, and is currently evaluating some promising proposed projects. Depending upon the projects selected, Tenaska estimates it could sequester 15 percent to 30 percent of the carbon emitted by the proposed Tenaska Washington II project through various sequestration projects.

5.5 BIOLOGICAL RESOURCES

The following section describes potential impacts to vegetation, wetland, wildlife and rare, threatened, endangered, and sensitive species from proposed project construction. Potential mitigation measures have been examined to minimize or eliminate these impacts.

5.5.1 Methods of Analysis

The impact assessment focuses on loss, degradation, or modification of vegetation, wetlands, wildlife, and rare, threatened, endangered, or sensitive species. Impacts are characterized as either direct or indirect. Direct impacts include habitat removal or destruction of individual plants and animals from construction or operation of the proposed project. Indirect impacts are induced by the proposed project. Effects can be removed in time or distance from the impact source. An example of a direct impact is loss of tree stands to construction; an indirect impact would be increased development of affiliated industry surrounding the project, causing additional habitat loss to wildlife. Impacts can also be considered either temporary (short-term) or permanent (long-term). Direct, short-term

impacts could occur as a result of temporary disturbance of sensitive wildlife species during construction, such as from noise, dust or traffic. Direct, permanent impacts would include permanent loss of plant or wildlife habitats in previously undeveloped areas.

Direct impacts from grading for the proposed project would include the elimination of existing vegetation, and loss of wildlife unable to displace successfully to another location. Indirect impacts from project construction typically extend beyond the project study area, as most wildlife at the site use an area of habitat larger than the project site vicinity. Hence, indirect impacts for wildlife are considered in a somewhat larger area depending on the species of concern.

5.5.2 Impacts and Mitigation Measures

The following discussion addresses impacts on vegetation, wildlife, and sensitive species. Because wetlands do not exist at the site, the proposed project would not impact this sensitive habitat.

Impact BR1 The proposed project could alter vegetation at the approximately 6.4-hectare (16-acre) site.

Impacts

The footprint of the proposed power plant is positioned so that impacts are confined primarily to the western half of the site. However, portions of the eastern half, particularly the northeastern corner, would be utilized for staging areas, construction worker parking and heavy machinery storage and maneuvering and would be affected. Direct, permanent impacts to upland fields, a low value-rated habitat, would occur from project construction in the western half of the site. Direct, temporary impacts would occur to this habitat in the eastern half of the site where the staging area will take place and be discontinued after project construction. Removal of much of this vegetation constitutes a minor impact and no mitigation measures are suggested. This habitat is disturbed and is common in many areas surrounding the project site, within and outside of the project vicinity. Impacts to a population of white-top aster (Aster curtus), which exists in the western portion of the site, are addressed under Impact BR3.

Both Douglas-fir and Oregon white oak stands have been classified as having moderate habitat value. A portion of these stands would be removed. Roughly one-half of the trees from each of the oak stands, up to 0.04 hectare (0.1 acre) collectively, and up to 20 percent, 0.2 hectare (0.4 acre), of the Douglas-fir stand would be removed for project construction. In addition, approximately 15 oaks and 20 Douglas-firs scattered throughout the rest of the project site would be removed. Trees removed would include both mature trees and young saplings/seedlings.

Potential direct, temporary and/or permanent impacts could occur to the oak and Douglas-fir stands beyond the boundary designated for power plant construction. These types of impacts may be caused by (1) movement/storage of heavy machinery, and (2) use of these areas for staging areas. Temporary impacts would include damage to trees (e.g., limb/bark removal, hitting/strong blow to the tree, minor soil compaction around roots) which does not necessarily permanently damage the tree and from which some trees can heal. Douglas-fir are, however, very sensitive to soil compaction around their roots and in most cases are likely to die. This would constitute a direct permanent impact. Some of the impacts, although not obvious, may cause permanent damage such as susceptibility to wind throw or disease.

Mitigation Measures

The following mitigation measures are suggested for this project in order to minimize impacts to vegetation:

BR1-1 Landscaping at the site could mitigate for loss of habitat from construction using exclusively native plants. Seeds/acorns for trees to be planted as compensation and/or landscaping, especially oaks, could be collected from sources at the site to ensure a greater success rate.

BR1-2 The number of trees removed during power plant construction could be minimized. Special attention should be given to trees in staging and other construction areas to avoid damaging them including compacting soil around their bases.

BR1-3 Landscaping practices could mitigate losses by replacing those trees lost by species type along the periphery and interior portions of the site. Smaller specimens could be salvaged from construction areas, stored and replanted as landscaping. A replacement ratio of 3:1 could compensate for the smaller size of the replacement stock and the uncertainty of survival.

These mitigation measures should be coordinated with Visual Resource mitigation measures which also call for landscaping.

In addition to mitigation measures listed above, Tenaska has embarked on a project with the Clover Creek Council, a local citizens group, whose mission is to restore and maintain the Clover Creek watershed. This watershed is currently in a severely degraded condition. Although the Tenaska Washington II project would be located in the Clover Creek watershed, the distance of the proposed site from Clover Creek is approximately 1.6 kilometers (1 mile). Tenaska has participated in a review of the Clover Creek Council's plans for an environmental education program targeted at youth in the Clover Creek watershed area. Tenaska has contributed funds to the Clover Creek Council to help with organizational development and project support.

Impact BR2 Construction of the proposed project could impact wildlife habitat at and surrounding the project site.

Impacts

Construction activities would eliminate some habitat, forcing birds, herpetofauna and mammals currently using the project study area into other areas. There could be some direct, permanent impacts to less mobile wildlife species. If this should occur, only species which are common in the region would be affected. Losses of these individuals are not expected to substantially alter local populations.

Construction activities would also occur at the substation. However, these activities would not cause impacts to vegetation or wildlife, because this area is already fully developed and disturbed.

Mitigation Measures

The following mitigation measure is suggested to minimize impacts to wildlife anticipated from this project:

BR2-1 Project construction should disturb as little area as possible in order to minimize potential impacts to wildlife.

Impact BR3 The proposed project could possibly impact sensitive species.

Impacts

No state or Federally-listed rare, threatened, or endangered species were observed during surveys. Ten wildlife species judged to be sensitive, but not protected, could occur at the site. None were observed during the field surveys. Of the ten sensitive species identified, five could be potentially impacted by the proposed project: western bluebird, western gray squirrel, mountain quail, Tacoma western pocket gopher and white-top aster. Except for the white-top aster, the probability of occurrence at the site is low.

Removal of vegetation could force western bluebirds, western gray squirrels, mountain quail and the Tacoma western pocket gopher if any are present on the site, into outlying habitats which may already be at capacity. Because of the small areal extent of the site and its only moderate habitat value, this impact, if it should occur, would affect very few individual birds or animals. The likelihood of impacting these sensitive species is expected to be low and minor because loss of any individuals that may inhabit or use the project site is not expected to substantially alter local populations. White-top aster (Aster curtus), a state-sensitive species and a Federal Candidate (C2) for listing under the Endangered Species Act, occurs in the western portion of the site as one main population and four subpopulations (Figure 5.5-1). The project as proposed would replace portions of this existing population as shown on Figure 5.5-1.

Figure (Figure 5.5-1 Location of White-top Aster....)

Mitigation Measures

The following mitigation measures are suggested for this project:

BR3-1 The Federal- or state-designated status of any species listed in this report or other could change to a protected class between the time of the environmental review and project construction. Potential changes should be monitored.

BR3-2 The hardiest populations of Aster curtus within the construction areas of the generation plant would be transplanted to an undisturbed portion of the site and maintained to exclude invasion species. A botanist would be consulted for the transplanting of the Aster curtus.

BR3-3 Depending on the construction schedule, seeds of the Aster curtus would be collected from the existing populations and given to the Washington State Department of Natural Resources or other agency for re-establishing Aster curtus populations at a more suitable location.

Impact BR4 Construction of the proposed project transmission interconnection lines, natural gas pipeline stub, water line, and sewer line could impact wildlife habitat and vegetation along a narrow corridor.

Impacts

If overhead transmission interconnection lines are used and transmission structures are installed, vegetation at a number of isolated plots along the transmission line corridor would be removed. If underground transmission interconnection lines are used and a natural gas pipeline is installed, a narrow trench the length of the transmission corridor would be dug. Again, vegetation would be removed, but in this case, it would become reestablished after construction is complete. Both overhead and underground lines would impact a very small area of land, considerably less than about 0.4 hectares (1 acre). No impacts from alteration of the substation are anticipated.

The installation of underground water and sewer lines would be in narrow trenches similar to the installation of the natural gas line. Removed vegetation would become reestablished after construction is complete.

Wildlife habitat which would be impacted by both these options, primarily upland fields, is already disturbed at the site and is common in the project vicinity. If wildlife is present, some individual animals may be forced to relocate. Wildlife species potentially impacted from these activities are common in the region. Any loss of individual animals in the project study area would be very small and would not be expected to alter local populations substantially.

Mitigation Measures

The following mitigation measures are suggested to minimize disturbance to wildlife and vegetation from project construction:

BR4-1 Avoid removal of all large trees to the extent practicable by routing transmission lines around them.

BR4-2 Minimize trench width and transmission structure base size.

5.6 LAND USE AND COMMUNITY CHARACTER

5.6.1 Methods of Analysis

Land use for the proposed project was examined with reference to existing or planned land uses, or planning regulations or controls adopted by local, state and Federal governing bodies. Consistency of the proposed project with these regulations/controls was reviewed and is described below.

5.6.2 Impacts and Mitigation Measures

Impact LU1 Construction and operation of the Tenaska Washington II power plant could alter land use at the project site.

Impacts

Construction of the power plant and transmission lines (overhead and/or underground) would alter land use at the site from vacant to industrial use. These project components are located in areas zoned for heavy industrial use and consequently they would be consistent with land use designations. The proposed project would also be consistent with all other existing county land use plans and policies. The Frederickson Rezone provides for and encourages intensive industry in areas zoned Heavy Manufacturing, such as the proposed project site.

The facility would directly border two other parcels devoted to heavy industrial uses to the south and southwest. Several other heavy and light industrial facilities are located in the vicinity of the site. No land use conflict or incompatibility with adjacent land uses is expected. Alteration of the substation would include expansion by roughly 0.07 hectare (0.17 acre) and inclusion of substation electrical equipment. No land use conflict or incompatibility with existing land use is expected.

Mitigation Measures

No mitigation measures are suggested.

5.7 HISTORY AND ARCHAEOLOGY

5.7.1 Methods of Analysis

Under the National Historic Preservation Act (NHPA) significant cultural resources are generally those which are 50 years or older, have substantial integrity of form, feeling or association, and meet one or more of the criteria for eligibility to the National Register of Historic Places (NRHP), as set forth in 36 C.F.R. Section 60.4. Impacts to National Register-eligible resources may be significant under NEPA. Criteria for assessment of effects are set forth in 36 C.F.R. Section 800. In addition to these criteria, resources may be significant under SEPA if they are listed or eligible for listing on state or local registers of local places. A detailed discussion of Archaeological survey methods is provided in Appendix F.

5.7.2 Impacts and Mitigation Measures

No archaeologic or historic resources are known to exist in the project study area or in its immediate vicinity.

Impact CR1 Construction of the Tenaska Washington II power plant associated transmission interconnection lines and natural gas pipeline stub, and alteration of the existing substation could disturb previously undetected cultural resources.

Impacts

Project construction would alter the site surface and a portion of the underlying soil. The project would have the potential to uncover, disturb or destroy archaeological resources and/or Native American burials which were not discovered during the field investigation and survey. However, the area is regarded as having only moderate to low archaeological sensitivity on the basis of research and reconnaissance. The potential for undiscovered resources is low.

Mitigation Measures

The following mitigation measure would reduce the impacts to undetected cultural resources.

CR1-1 If archaeological materials or human burials are uncovered during construction, work in the vicinity would halt until the significance of the find can be evaluated by a qualified archaeologist or, in the case of human burials, until the County Coroner and the appropriate Native American tribe have had an opportunity to make their findings and recommendations for the burials disposition.

5.8 SOCIOECONOMICS AND PUBLIC SERVICES

5.8.1 Methods of Analysis

Methods of analysis for this section were used to determine existing conditions and compare these with anticipated changes from the proposed project. Background conditions were obtained from material provided by the City of Tacoma, Pierce County and the Tacoma-Pierce County Chamber of Commerce. Information on anticipated changes from the proposed project was obtained from Tenaska.

Socioeconomic effects of an action would be judged to be an impact if they resulted in a substantial imbalance between housing demand and supply; if they increased the demand for local services sufficiently to cause a deterioration in existing services; and if they included more than a 1 percent reduction in tax revenue.

Construction of the proposed project would include an 18-month construction period beginning in January 1995, and would involve the employment of about 225 to 250 persons. Commercial operations are scheduled to begin in June 1996, and the facility is expected to employ about 30 persons.

5.8.2 Impacts and Mitigation Measures

Impact SE1 Construction and operation of the proposed power plant could affect population, employment, and demand for housing in the Frederickson/ Tacoma area.

Impacts

Population. Construction workforce for the proposed project would number about 225 to 250 workers. It is expected that the majority of construction workers would be from the Seattle/Tacoma metropolitan area, located between 8 and 48 kilometers (5 and 30 miles) from the proposed site. Workers outside of the nearby area would likely commute from their existing residences rather than relocate to Pierce County during construction. Because relatively few of the construction workers or operation employees are expected to move into the area for employment, impacts on population growth would be negligible.

Operating staff would include a total of about 30 persons working in shifts. The proposed power plant would operate 24-hours per day, 7 days per week. About 14 personnel would be present on site during the day on weekdays. Except for six or seven managerial staff who would likely be transferred from outside the area, the majority of the permanent staff would be expected to be hired from the existing local workforce.

If it is assumed that one-half of the operating staff (15 new permanent employees) moves into the Pierce County area, that one person per household would be employed at the proposed facility, and that an average household size for Pierce County is 2.5 persons per household, then the total increase in population would be 37 or 38 persons. Thus, relative to the population of the county, this would represent a small increase in population.

Housing. Because of the short duration of construction and the expected ability of the local construction workforce to accommodate the needed construction skills, local housing supply would be only minimally affected during power plant construction. Construction workers outside of the

Pierce County area would likely commute from their existing residences rather than relocate to Pierce County during construction.

The majority of the employees at the proposed power plant would already reside in the local area. Under a worst-case scenario, even if half the new employees move into the local area, there would be little to no impact on the local housing market. (In 1991 there were 3,373 vacant, single-family housing units and 2,921 vacant, multi-family housing units in the Tacoma/Pierce County area.)

Employment. A temporary increase of approximately 225 to 250 jobs would occur during the time of project construction. Project construction is expected to last for about 1 year. The increased number of construction workers would likely have a small beneficial indirect impact on other service-oriented businesses, but is not expected to have an appreciable indirect effect on employment for the area. About 30 permanent jobs would be associated with the proposed project. The net effect on employment is expected to be positive.

Mitigation Measures

No mitigation measures are suggested.

Impact SE2 Construction and operation of the proposed power plant could increase tax revenues.

Impacts

Tenaska has estimated annual taxes for the proposed project at approximately $1 million for property taxes, $7 million for state (6.5 percent) and county (1.0 percent) sales tax, and $1 million for a state gas use tax, based on normal availability of natural gas consumed. These taxes are based upon an expected 20-year life of the facility, beginning in 1997. The facility may continue operating after 20 years depending on energy production needs and the need for capital improvements at that time.

Mitigation Measures

No mitigation measures are suggested.

Impact SE3 Construction and operation of the proposed power plant could increase the demand for local services.

Impacts

Fire Protection. A 2,270-cubic meter (600,000 gallon) fresh water storage tank would be used to supply water for fire protection, which would be sized to deliver about 126 liters per second (2,000 gallons per minute). The staff at the Tenaska Washington II power plant would be trained to handle small fire emergencies.

Services available from the local fire districts do not include response to hazardous material emergencies; hazardous material response capability would likely be handled by trained personnel at the power plant or from the City of Tacoma Hazardous Material Response Team. Spill Prevention Control and Countermeasure Plan, required for the proposed project, would indicate to the local Fire Districts how to manage an industrial fire (see Public Health and Safety Section 5.9).

Of concern to the Fire District is the storage and transportation of hazardous materials to and from the site. Any changes impacting transportation of materials or increased vehicle traffic would affect Fire District #7 and District #21.

Operations at the facility would be typical of a small, light industry. Emergency planning and trained staff at the proposed facility could deal with a small fire if it was to occur. Major emergencies would be unlikely. Impacts to the fire districts are expected to be minor.

Law Enforcement. It is not expected that there would be a demand for law enforcement at the power plant. Response times to call in the vicinity of the project site vary depending on the location of the squad car, the nature of the call, as well as other factors.

Education/Schools. Because the proposed project is not expected to cause substantial increases to the area population, no adverse effects on schools would be expected.

Libraries. Because the proposed project is not expected to have an impact on population in the area, no adverse effects would be expected.

Mitigation Measures

No mitigation measures are suggested beyond those built into the project.

5.9 PUBLIC HeaLTH AND SAFETY

5.9.1 Methods of Analysis

Methods used for analysis include the review of relevant State and Federal guidelines and regulations for public health and safety, internal BPA guidance on impacts from electric and magnetic fields, and discussions with Tenaska describing expected project processes and operations. Much of the information used was developed using the professional experience and best judgment based upon projects of this type.

The term hazardous materials refers to substances which, if released in an uncontrolled manner, can be harmful to people, animals, property, and/or the environment (Planning Guide and Checklist for Hazardous Materials Contingency Plans, Federal Emergency Management Agency, July 1981). Potential impacts from hazardous waste were reviewed to determine if the proposed project involves use or storage of a hazardous substances in a manner that poses a threat to public health or safety. Potential toxic air pollutant emissions for the proposed power plant are discussed in Section 5.4.

5.9.2 Impacts and Mitigation Measures

Impact HS1 Undetected hazardous materials already at the site could be disturbed during construction and released to the environment.

Impacts

There are no known hazardous substances already at the site that could be disturbed during construction, based upon the results of a Phase I Site Assessment performed by ENSR (1993). There are no potential impacts to the site from adjacent properties based upon Phase II Site Assessment studies reviewed by ENSR (1993).

Mitigation Measures

No mitigation measures are suggested.

Impact HS2 Hazardous materials used during construction could be spilled and released to the environment.

Impacts

Hazardous materials likely to be used during construction are gasoline, diesel fuel, motor oil, and possibly solvents and paints. Potential water quality impacts include the introduction of oils, grease, and petroleum products resulting from the use and/or improper handling of heavy equipment and construction products on the site. Because of the pervious nature of the soils, these contaminants could be transported into the shallow groundwater system during rainfall.

Another source of potential groundwater contamination and risk to public health could be from underground transmission lines. Lines are dug and placed at least 1 meter (3 feet) below ground surface. These lines are filled with a synthetic insulating liquid commercially marketed as DCL 500, which could potentially leak during operation or be spilled during construction. DCL 500 is not listed as a hazardous substance on either EPA's Hazardous Waste List or Hazardous Substance List or on the Occupational Safety and Health Administration's (OSHA) Occupational Safety and Health Standards List of Cancer Suspect Agents. In addition, the Material Safety Data Sheet (MSDS) does not list any adverse health risks expected under normal conditions/use. DCL 500 is a stable, inert material under normal storage and handling conditions and does not present a high health risk. In addition, DCL 500 has an ignition point of 165y to 185yC (330y to 365yF), which is well above temperatures that will exist during normal operating conditions. Also, DCL 500 is relatively water insoluble

(0.1 percent). DCL 500 poses the risk of only minor human irritation, would not constitute a serious threat under normal working conditions and would not require the use of respiratory protective equipment. Because of its non-compressible, relatively viscous state, the threat of DCL 500 entering the groundwater is low. If a leak were to occur, only a limited quantity of fluid would escape before pressure was relieved. The line would be pressure tested when first installed and then continually pressure monitored for potential leakage. The steel pipe containing the fluid is welded completely end-to-end and coated and cathodically protected from corrosion. Thus, potential for leakage and risk to human health is low. (Phil Black, Tenaska, pers. comm., April 22, 1992).

Mitigation Measures

The following mitigation measures are suggested:

HS2-1 Storm water runoff could be controlled in a manner which would limit erosion, such as the use of hay bales, sandbags, or other temporary sediment fences. Equipment and machinery used during construction could be kept covered with a waterproof tarp to prevent contamination from rainfall runoff.

HS2-2 Construction could be scheduled by conducting those phases of development which require the greatest amount of earthwork (initial construction phase) to occur during months of low rainfall.

HS2-3 Fuel tanks could be mounted above ground and over a curbed concrete pad.

HS2-4 If a spill did occur, contaminants should be contained and removed immediately according to pollution prevention control plans.

HS2-5 DCL 500 should be handled according to instructions provided in its MSDS; other potential state and local handling practices and regulations for this material should be observed.

Impact HS3 Hazardous substances used or generated during power plant operations could be spilled and released to the environment.

Impacts

Chemicals used at the proposed project would be transported to the site by truck. Storage volumes are determined by rates of consumption, customary delivery volumes available from suppliers, and the reliability of the supply. A summary of the chemicals to be stored and used at the proposed facility is shown in Table 5.9-1.

Chemicals used and stored at the proposed project would be managed in a manner that would contain the material within a bermed area in the event of a spill or failure of a tank. Runoff from the back-up fuel tank storage area is detained prior to discharge into the storm water sump. If contamination from the fuel oil tank does occur, the runoff can be redirected into the oil-water separator for eventual discharge into the sanitary system. If a discharge to the sanitary sewer system were allowed, it would be directed to an enhanced coalescing plate oil/water separator.

TABLE 5.9-1
MAJOR HAZARDOUS SUBSTANCES STORED AT THE PROPOSED POWER PLANT

Substance	Purpose	Maximum Stored Quantity	Characteristics of Containment
Aqueous Ammonia (93% Concentration)	Air pollution control	45 m3 (12,000 gallons)	Tank: above grade, welded steel, pressurized. Located outdoors within concrete containment area, sized to contain volume in tank plus 15 cm (6 in) freeboard during the initial period following a total failure of the tank.
Sulphuric acid	Water treatment	23 m3 (6,000 gallons)	Tank: above ground, welded steel. Located indoors, within

concrete containment area sized to contain volume in tank

plus 15 cm (6 in) freeboard.

Caustic soda	Water treatment	23 m3
Tank: above ground, welded steel. Located indoors within		
(sodium hydroxide)		(6,000 gallons)
concrete containment area sized to contain volume in tank		
(50% Concentration)		
plus 15 cm (6 in) freeboard.		
Polymer/organic	Water treatment	6 m3
Tank: above ground, plastic container. Located indoors		
phosphonate/azole mixture		(1,500 gallons)
within curbed containment area.		
Bromine	Water treatment	230 kg
Dry, in pellets, stored in bags. Will be mixed in		
		(500 lb)
contained area indoors on an as-needed basis.		
No. 2 Fuel oil	Back-up fuel	35,000 barrels

Tank located outside within a dike sized to contain full

content of tank plus 30 cm (12 in) freeboard, mounted over

impervious lining. Storm water runoff checked for

contamination prior to sump discharge.

Leakage or minor spills during loading and unloading are more likely than a complete tank failure. In the unlikely event that a complete tank failure should occur, ammonia or sulphuric acid vapors would be dispersed by wind beyond the boundaries of the proposed power plant. Under certain conditions these fumes could present a threat to the health of neighborhood residents or workers. The level of risk or threat is proportional to a number of factors, including quantity of materials lost, weather conditions (e.g., wind, precipitation, temperature), time of day, and location of leak.

Mitigation Measures

A Spill Prevention Containment and Countermeasure (SPCC) Plan and appropriate training of personnel using procedures outlined in the Federal Resource Conservation and Recovery Act (RCRA) could be instituted.

Many environmental and personnel safety control factors are included in the proposed project design and are outlined in Section 5.14.

Impact HS4 Electrical transmission lines could pose an electric shock hazard.

Impacts

Power lines, as with electrical wiring, can cause serious electric shocks if certain precautions are not taken. These precautions include building the lines to minimize the shock hazard, based upon the NESC requirements, which would be followed for this project.

Transmission lines can also induce voltages into objects near the lines. This effect can lead to nuisance shocks if a voltage is induced on something like wire fencing which is on wood posts and, therefore, insulated from ground. Usually this becomes a problem only with lines of voltages above 230-kV. Should problems develop with high- or low-voltage lines, they can be corrected by simple grounding techniques. There is also potential to cut underground cables with trenching equipment which may pose a shock hazard to construction workers.

Mitigation Measures

No mitigation measures are suggested beyond those built into the project.

Impact HS5 Electrical transmission lines could increase the exposure of individuals to electric and magnetic fields.

Impacts

There are no national standards for electric or magnetic fields. Some states have established electric or magnetic field standards; however, the State of Washington has not set a standard for either. BPA has an electric field standard of 9 kilovolts per meter (kV/m) maximum on the right-of-way and 5 kV/m at the edge of the right-of-way. The proposed

project's overhead transmission line option would meet this electric field standard. There would be no electrical field produced by the underground transmission line option.

Exposure Assessments. In general, magnetic field exposure assessments are performed by calculating field levels in locations where there are potential long-term exposures to people. This is usually done by assessing the number of homes, schools, or businesses near the proposed project where increases in electric and magnetic field exposures may be created by the proposed project.

A comparative analysis of the potential magnetic field levels between the proposed overhead and underground alternatives has been made. All calculations were based on the rated capacity of the proposed power plant. That is, it was assumed that the power plant would operate as closely as possible to its rated capacity on a daily basis. All magnetic field calculations were made using industry accepted computer modeling techniques. Graphical representations of the magnetic field profiles for the overhead and underground alternatives are shown in Figure 5.9-1.

Overhead Transmission Option. The nearest structure to the proposed location of the new transmission line is an industrial building about 60 meters (200 feet) away. Analysis indicates that the potential magnetic field exposure for the site will average less than 2 mG with a maximum of 4 mG (Refer to Section 4.0, Tables 4.9-2 and 4.9-3 for typical magnetic field exposure levels from common appliances and transmission lines).

Thus, if the overhead option is selected, there will potentially be an increase in magnetic field exposure from the transmission line to those working in the industrial building. This increase would be from a no exposure level (since no line currently exists there) to an exposure of less than 2 mG.

Underground Transmission Option. There would be no substantial electric or magnetic fields produced from the underground transmission option that could affect homes, schools, or businesses near the proposed project.

Figure (Figure 5.9-1 Transmision Line Management...)

If the underground option is selected, BPA's guidelines of not increasing electric or magnetic exposure to people will be met.

Electric Substation. The electric and magnetic fields from the proposed substation facilities will not increase exposure to the adjacent homes or businesses.

Exposure to Workers. Any electrical generation plant will produce some level of electric and magnetic fields within the plant. It is understood that workers in that plant will be exposed to these fields during the course of performing their job. Presently, there is no way to assess what levels or for what duration exposures might be to those working at the proposed Tenaska Washington II power plant.

Mitigation Measures

No mitigation measures beyond those already considered (i.e., underground option) are suggested for the transmission lines.

Impact HS6 Microwave communications could increase the exposure of individuals to non-ionizing radiation.

Impacts

Communications. Electronic signals to be produced from microwave communications at the substation are low level and limited to specifically assigned government radio frequencies far removed from the radio and TV broadcast frequencies. Broadcast interference across the radio frequency spectrum would not be produced by the equipment installed at this BPA facility.

Exposure to non-ionizing radiation from sources including radio transmitting antennas is an area of increasing public awareness and concern. In an attempt to protect the public and workers, national standards have been and continue to be developed which establish "safe" limits of radiation. There is disagreement within the scientific community regarding the medical basis from which the standards were developed. Until those issues are resolved, the standards are established at conservatively stringent levels. Standards for exposure to the general public are contained in

Institute of Electrical and Electronic Engineers (IEEE) C95.1-1991, and in OSHA 29 C.F.R. Section 1910.97 for workers.

Present IEEE standards applying to this site allow a maximum power density of 1.3 milliwatts per square centimeter at 2,000 MHz (microwave transmitters). The OSHA standard limits the maximum power density to 10 milliwatts per square centimeter (all transmitters).

Expected levels of power density will fall far below the standards, and the expected exposure to the public and workers will be well within the IEEE and OSHA standards. No other standards or regulations apply at this site.

Mitigation Measures

No mitigation measures are required given the low levels of non-ionizing radiation in relation to the accepted standards.

HS6-1 The project would conform to American National Standards Institute (ANSI) and OSHA codes for all workers.

5.10 TRAFFIC AND TRANSPORTATION

5.10.1 Methods of Analysis

Project-generated traffic and transportation were examined with reference to county Level of Service standards for those intersections or roadway sections currently operating at Levels of Service C, D, or E, as defined in Section 4.10.3 and in Table 4.10-1.

5.10.2 Traffic Generated by the Proposed Project

The proposed project would generate traffic during both construction and operation phases. A number of assumptions were used to estimate impacts to existing traffic conditions from the proposed project during construction. These are summarized below and represent a worst-case scenario:

- The construction workforce would peak at 225 to 250 people.
- All construction workers, including those traveling in both trucks and personal vehicles, would arrive to the site between 6:00 to 7:00 am and leave between 3:00 and 4:00 p.m.
- All construction workers would live and travel to/from areas north of the site, specifically Tacoma and Puyallup.
- All workers would choose to follow the same basic route to the site; from Tacoma: south on I-5, east along State Route 512, south on Canyon Road to its terminus with 192nd Street East, and west to an access road to the site; from Puyallup: west along State Route 512, south on Canyon Road to its terminus with 192nd Street East, and west to an access road to the site.
- Public transportation would not be used by construction workers to get to the site.
- A carpool factor of 1.15 persons per vehicle would apply to construction workers.
- Sixty truck trips per day would occur into and out of the site, 25 of which over the entire construction period would exceed 90 metric tons (100 tons); the remainder would be at or below 45 metric tons (50 tons).
- The permanent workforce at the proposed power plant would number 30 people.

5.10.3 Impacts and Mitigation Measures

Impact T1 Project construction could increase vehicular traffic in the study area.

Impacts

Two types of traffic would be generated from the construction period: truck traffic and construction workers personal vehicles. If it is assumed that 100 percent of this traffic would travel south on Canyon Road and west on 192nd Street East to reach the site during peak-hour times for Canyon Road, the volume of traffic along this route would increase by 13 percent for Canyon Road and 177 percent for 192nd Street East over current levels. Roadway Levels of Service would remain the same for Canyon Road during construction. Canyon Road operates freely most of the time with congestion occurring briefly during commute hours. Construction traffic would flow counter to peak flows and, thus, would not contribute to congestion. Level of service on 192nd Street East would deteriorate from a Level of Service "A" to a Level of Service "B" (as defined in Section 4.10.3 and Table 4.10-1). With construction of the project, Levels of Service are shown in Table 5.10-2. Additionally, because data used for calculating construction traffic assumes a worst-case scenario (i.e., 275 workers, 60 truck trips per day, all traffic at the same time down Canyon Road), traffic impacts would be less than predicted for most of the construction period.

It is expected that a total of roughly 26 truck trips over the entire construction period would exceed 90 metric tons (100 tons): roughly twenty at 100 metric tons (110 tons), three at 145 metric tons (160 tons), one at 172 metric tons (190 tons), and one at 263 metric tons (290 tons). These weights would normally represent several times over the legal limit per axle with a three- or four-axle vehicle. Overweight permits would have to be obtained from Washington Department of Transportation, Pierce County, and other local jurisdictions, depending on the direction from which these units would be delivered. The jurisdictions could require special multiple-axle trucks to carry the units under the permits. Some interruption of traffic could occur where overweight materials are moved.

Construction worker parking would not create competition for on-street parking spaces as parking would be available on-site.

Mitigation Measures

The following mitigation measures are suggested in order to minimize disturbance to existing traffic and transportation conditions:

T1-1 Construction workers could be encouraged to carpool to site.

T1-2 Truck trips could be spaced out over entire working day, avoiding peak-hour times.

T1-3 Use of the railroad for material hauling could be utilized as much as practicable in place of the trucks.

T1-4 Designated access routes through currently low-use areas should be designed for construction vehicles. Access routes should be consistent with state and county plans/regulations.

Impact T2 Project operation could increase permanent vehicular traffic in the study area.

Impacts

It is estimated that a total of 25 to 30 full-time employees would be required for power plant operation. However, because the proposed power plant would run on a 24-hour schedule, several shifts would be established for power plant operation. Therefore, it is estimated that a total minimum of 18 employees would be at the site during the busiest shift. Assuming all permanent workers would live north of the site and follow the same route taken by construction employees, and assuming each employee drove separately to work, the contribution of vehicles for the proposed project would create an increase of one percent in traffic along Canyon Road. Other streets within the project study would receive less impact because they are outside the anticipated commute corridor. The total number of full-time employees estimated is relatively small and most of the roads in the study area are currently functioning substantially below capacity.

Mitigation Measures

The following mitigation measures are suggested:

T2-1 Permanent employees could be encouraged to carpool to the

site.

T2-2 Shifts could be scheduled to avoid employees traveling to the site during peak-hour traffic conditions to the extent practical.

5.11 ENERGY AND UTILITIES

5.11.1 Methods of Analysis

Methods used for analysis in this section included discussions with the TPU, the Pierce County Utilities Department, Pierce County Solid Waste Management Department, and review of plans provided by Tenaska. These plans indicated locations, points of connection, and requirements of utility providers.

Project-related utility demands were examined with reference to potential effects on utilities and utility users. Demands for electricity caused by the proposed project in excess of existing and anticipated future needs, or demands that would require relocation of utilities were considered impacts.

5.11.2 Impacts and Mitigation Measures

Impact EU1 Construction and operation of the proposed project would require the use of public utilities.

Impacts

Water Supply. Water requirements for the Tenaska Washington II power plant would be approximately 7 million liters per day (1.9 million gallons per day). The City of Tacoma would provide water supply for the proposed development.

Currently, TPU supplies the Frederickson Industrial Area with approximately 7.5 million liters per day (2 million gallons per day) and has the capability and supply line capacity to supply up to 15 million liters per day (4 million gallons per day). As the Tenaska Washington II project would require approximately 7.5 million liters per day (2 million gallons per day), the capacity of the line would be roughly at maximum with this power plant on line (Linda McCrea, City of Tacoma, pers. comm., March 29, 1993). Water service is not presently provided to the site, but is planned for the potential development of the Tenaska Washington II power plant.

The TPU is conducting a study to determine the adequacy of the existing system and future needs of water supply for the Frederickson area. Preliminary indications are that the existing supply would be adequate for the expected demands from anticipated industrial development in the Frederickson area for five years past the Tenaska Washington II power plant start-up date. If results of the study indicate that future water supply may be inadequate for anticipated growth in this area, other water resources would be investigated. TPU has indicated that it is willing to continue supplying the needs of Tenaska past the present capacity with the understanding that Tenaska would help fund a new water supply line to the area when and if needed. Additional water supply would be provided with the construction of an additional trunkline from a local reservoir and possibly from local wells. If wells were used in the area, they would be dug at approximately 305 meters (1,000 feet) in depth, far below local wells currently supplying residents in the area and contained within a separate aquifer. No impacts to the shallower aquifer are anticipated from this action. In addition, use of these deeper wells would be primarily limited to periods when water supply from the Green River and local reservoirs was limited for some reason (e.g., rupture in the supply line or drought) (Linda McCrea, City of Tacoma, pers. comm., March 29, 1993). These sources are expected to provide sufficient water for expected development including the proposed project.

Wastewater Disposal. Waste water would be generated from storm water runoff from the process equipment area, demineralizer regeneration water, cooling tower blowdown (discharge from accumulated wastes), and boiler blowdown. The amount generated would depend on the size of the storm. A detention pond has been designed for the project to handle runoff anticipated for a 100-year flood occurrence. The process equipment area and other areas containing potentially hazardous materials will be curbed to contain runoff. These waste waters would be directed to a sump with an oil-water separator. The oils and greases removed would be collected and disposed of by a licensed disposal contractor. All polluted or potentially polluted wastewater from the project would be discharged into the Pierce County sanitary sewer. This would include cooling tower blowdown, process wastewater, sanitary wastewater and storm water runoff from areas that could potentially be contaminated with oil or chemicals. Unpolluted storm water runoff would be routed to an infiltration system where it would percolate into the ground. A more detailed description of the drainage system can be found in Section 5.3.

About 380,000 liters per day (100,000 gallons per day) of process waste water would be discharged into the sanitary system. The sanitary system treats up to 43.5 million liters per day (11.5 million gallons per day) and has sufficient capacity to accommodate flow from the proposed project. (Jim Landen, Chambers Creek Treatment Plant, pers. comm., April 21, 1993).

Solid Waste Disposal. Solid waste generated from the site would mostly consist of packing crates, wastes from maintenance, and wastes from normal employee activities. Solid waste would likely be collected by LeMay Disposal for disposal at the Land Recovery landfill. Landfill options are currently being investigated by the Solid Waste Management Division of Pierce County. It is expected that the existing solid waste disposal services would be adequate for the proposed project.

Electricity. Electrical power would be required for construction and as a back-up supply during times when the proposed project was not producing power. Although two power supplies are available, the proposed facility will likely use the TPU's 12.5-kV transmission line. Adequate electricity is available for the proposed project. The net effect on power use and production would be positive because the proposed facility is designed to produce far more energy than it consumes.

Natural Gas. The proposed Tenaska Washington II project would operate on natural gas, which would be transported to the proposed power plant by Northwest Pipeline Corporation. A short feeder pipe or stub would be built to connect the facility to Northwest's pipeline approximately 0.8 kilometer (0.5 mile) southeast of the power plant site. Adequate natural gas supplies are expected to be available for the 20-year life of the proposed project.

Mitigation Measures

No mitigation measures are suggested.

5.12 NOISE

5.12.1 Noise Sources

Construction and operation of the proposed facility would add new noise sources to the environment. The primary operational noise at the Tenaska Washington II power plant would be as listed in Table 5.12-1. All noise levels have been adjusted to the level received at a distance of about 30 meters (100 feet), for ease of comparison.

Construction at the site would last approximately 18 months. Noise emissions of construction equipment that may be used at the site are shown in Table 5.12-2.

5.12.2 Noise Receptors

The closest residents are located along 184th Street East and 50th Avenue East, at a distance of about 490 meters (1,600 feet) from the turbine inlet on the north side of the project site.

TABLE 5.12-1
EQUIPMENT NOISE SOURCES DURING POWER PLANT OPERATION
(dBA)

Equipment	Noise Level at 30 m (100 feet)
HRSG stack with silencer	65
HRSG walls	70
Turbine inlet with silencer	67
Turbine within building	65
Cooling tower (at tower inlet)	74
(at end wall)	60
Transformers	79

Other receptors are commercial and industrial facilities located at shorter distances, typically from about 150 to 300 meters (500 to 1,000 feet). The noise limits for these industrial and commercial noise receptors are 10 to 20 dBA higher than the limits for residential areas.

However, some adjacent industrial property lines are less than about 60 meters (200 feet) from noise producing equipment at the Tenaska Washington II power plant site.

5.12.3 Methods of Analysis

Project-related noise was examined with reference to state and county noise limits. In addition, the project noise increases are also examined in an assessment of relative noise level changes. Based upon Federal EPA Region 10 guidelines for noise, the impacts of an increase in community noise levels is assessed as shown in Table 5.12-3.

The impact of increases in noise applies to the time period encompassing the typical noise environment of the receiver - for workers, and 8-hour daytime average (Leq), and for residents, a 24-hour day-night average (Ldn).

TABLE 5.12-2
TYPICAL CONSTRUCTION EQUIPMENT NOISE (dBA)

Equipment Type	Noise Level at about 15 meters (50 feet)	Usage1
Earthmoving:		
Front Loaders	79	0.40
Backhoes	85	0.16
Dozers	80	0.40
Tractors	80	0.40
Scrapers	88	0.40
Graders	85	0.08
Trucks	91	0.40
Pavers	89	0.10
Materials Handling:		
Concrete	85	0.40
Mixers	82	0.40
Concrete Pumps	83	0.16
Cranes	88	0.16
Derricks		

Stationary:		
Pumps	76	1.00
Generators	78	1.00
Compressors	81	1.00
Impact:		
Pile Drivers	101	0.04
Jack Hammers	88	0.10
Rock Drills	98	0.04
Pneumatic Tools	86	0.16
Other:		
Saws	78	0.04
Vibrators	76	0.40

1 Fraction of the time the equipment is operating at the level shown when it is being used at a construction site.

Source: Taken from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances." Prepared by Bolt, Beranek, and Newman for the U.S. Environmental Protection Agency, December 31, 1971.

TABLE 5.12-3
IMPACT OF NOISE INCReaSE

Increase	Impact
0 to 5 dB	Slight
5 to 10 dB	Significant
10 to 15 dB	Serious

5.12.4 Impacts and Mitigation Measures

Impact N1 Operation of the Tenaska Washington II power plant could increase ambient noise levels.

Impacts

Noise from equipment and activity at the proposed power plant site would propagate to the surrounding area. The level of noise will diminish as it travels to the receiver primarily due to absorption of noise by the atmosphere and due to the spreading of the noise energy over a larger area. Noise levels were predicted at the property lines bounding the Tenaska Washington II power plant site and at the nearest residence. They are shown in Table 5.12-4.

The allowable noise level at a neighboring industrial property line is 70 dBA. The noise level on a typical urban street is 65 dBA. As indicated in Table 5.12-4, the Tenaska Washington II power plant would result in a maximum noise level at the Tenaska's property line of 66 dBA. Thus the proposed project would comply with noise standards for adjacent industrial property. Noise emitted from alterations to the substation, including new electrical and communication facilities would not appreciably increase the amount of noise generated from the proposed project. (Holeman, BPA, pers. comm., April 23, 1993).

TABLE 5.12-4
PREDICTED NOISE LEVELS (Leq)
TENASKA WASHINGTON II POWER PLANT OPERATION

(dBA)

Equipment	Noise Level
Nearest residence	46
West property line	66
South property line	66
North property line	64
East property line	less than 64

The allowable noise level at the nearest residential property is 50 dBA (night time) as specified in Pierce County noise ordinances and state law. The predicted noise level at the nearest residence is 46 dBA assuming wind and temperature conditions that are favorable to

the propagation of noise. This value may be raised by a few dBA during strong southwest winds. The standards allow a 5 dBA increase over the limit of 50 dBA for 15 minutes in any hour. Thus the proposed project would comply with noise standards for residential property.

The lowest night-time ambient noise level measured was 44 dBA. If this noise level was prevalent at the nearest residence, the increase in noise level due to the proposed project would be less than 5 dBA. According to EPA criteria, this would be a slight impact.

Mitigation Measures

No mitigation measures beyond those already built into the project are suggested.

Impact N2 Construction of the Tenaska Washington II power plant and substation could temporarily increase ambient noise levels.

Impacts

Noise from construction equipment and activity would propagate to the surrounding area for the duration of construction. As shown in Table 5.12-2, construction equipment noise would be expected to occur for many operating equipment types during the 18-month construction period. Sounds would be noticeable in areas surrounding the property site, including adjacent industries and nearby residences. The sounds would be typical of a new construction activities, and would be intermittent in nature. Intermittent noise from construction of the substation would occur and would be contained within a maximum 15-month period.

Mitigation Measures

The following mitigation measures are suggested in order to reduce noise emanating from the proposed project.

N2-1 Restrict construction operations to the hours of 7:00 a.m. to 6:00 p.m.

N2-2 Ensure proper muffling of combustion engines, including periodic monitoring.

5.13 VISUAL QUALITY

5.13.1 Methods of Analysis

Visual contrast effects would likely be long-term (normally defined as greater than five years) because visual change would last for the life of the proposed project. Quality of the visual environment was based on VQO levels or the synthesis of scenic quality and visual sensitivity. The measure of the adverse response of the visual and aesthetic resources is defined as visual contrast. The degree to which the project adversely affects the aesthetic quality of the landscape depends upon the amount of visual and aesthetic contrast that is created by the project in relation to the existing landscape character. The amount of contrast between the proposed action and the existing landscape character was assessed by separating the landscape into its major features (landforms, vegetation patterns, and structures), and then predicting the magnitude of change in contrast of each of the basic visual elements (form, line, color, and texture) to each of the features. The ability of the existing landscape to screen out or absorb change was assessed. The existing landscape condition was also factored into the assessment.

Issues identified during scoping included the level of visual contrast, the type and extent of actual physical contrast or aesthetic degradation, and the level of visibility or viewshed disturbance caused by site location, structures and activities proposed for the project. The type of actual physical contrast was examined by evaluating the following criteria: landforms, diversity, soil color and erosion potential, vegetative patterns, and structure compatibility. Several variables were considered in establishing

overall visibility levels: view orientation, lighting conditions, seasonal effects, view distance, duration of view, visibility, viewer numbers, and use association. The assessment was based on the effects of visual contrast from identified KOPs which are further described below.

Other criteria used to rate the level of visual change were scale and spatial dominance. The scale of the project modifications were compared to the scale of the entire landscape setting and placement in the viewshed. Spatial dominance was evaluated based upon the complexity of landscape composition, elevations and position of the project to the key observation points, and landscape background of seen structures and facilities. Another scoping issue was a concern of night lighting from various viewer locations.

The selection of key viewing points was based upon the representative or typical condition of the viewers potentially affected by the proposed project. Of the viewpoints initially studied, five were selected as key viewing points, most representative of travellers, residents, or recreationists. The six observation points consisted of two travel routes, two residential locations, and two locations in Mt. Rainier National Park. For residential and travel route KOPs identified in the project area, balloon field studies were conducted. A 1-meter (3-foot) diameter weather balloon was placed at the location of the stack and strung to the approximate stack height. Photographs were taken from each of the viewing locations, with the exception of Mt. Rainier, to record project visibility.

5.13.2 Impacts and Mitigation Measures

Impact VQ1 The proposed power plant could alter visual quality within the Frederickson Industrial Area and its immediate surroundings.

Impacts

Table 5.13-1 provides a summary of visual effects from the proposed project. It would create a long-term low to moderate adverse additive impact to the visual aesthetic resources in the study area. A moderate to strong vertical line and contrast to landforms and low to moderate color, and texture contrast to vegetation patterns would be created by the emission stack and turbine building and other major project facilities including the cooling tower and oil storage tank. The cooling tower would emit a plume with a fog-like appearance containing almost 100 percent water vapor. (Chuck Eliason, Tenaska, pers. comm., March 1993.) If buried, the transmission interconnection cable would create a low short term line and color contrast to soil and vegetation patterns. If above ground, the transmission interconnection line could result in additional impacts.

The project area's landscape character is generally not intact and the surrounding landscape has been previously disturbed. The existing landscape condition contains a number of major and minor disturbances including cleared pipeline, railroad, and transmission line rights of way, a network of access roads, industrial complexes and structures (e.g., gas-fired power plant, electric switching station, and one large sand and gravel pit). These disturbances have disrupted the landscape unity creating some unnatural edges to vegetation patterns, introduced blocky structures to landforms which dominate the landscape and draw visual attention to incongruent patches of color and texture variety. As viewed from the key observation points, the additive increases toward visual change to visual aesthetic resources brought about by the proposed project would be moderate overall.

The view of the project from representative KOP residential locations would result in a moderate, long-term additive impact. The level of existing visual intrusions (e.g., transmission lines, switch yard, industrial structures) causing visual contrast is high. The existing landscape's scrub vegetation would visually absorb a portion of the project. The cluster of coniferous trees (18-24 meters [60-80 feet] tall) located east adjacent to the site would help screen out visibility to taller facilities including the stack. Occasional disruption of the view of Mt. Rainier from the project site may occur during favorable weather conditions due to the cooling tower plume. The visual impacts from the Canyon Road KOP would be low. View duration toward this project site is brief. The sand and gravel pit

disturbance and view of Mt. Rainier would draw greater visual attention than views of the project site. The visual impact from the 38th Avenue KOP would be low. The landscape absorption capability is high due primarily to vegetation screening.

TABLE 5.13-1
VISUAL RESOURCE INVENTORY AND ASSESSMENT

Key Observation Point	View Direction[1]	View Distance (miles)	Visual Sensitivity Level[2]	Existing Landscape Condition[3]	Project Visibility[4] Generation Plant	Project Visibility[4] Emission Stack	Project Visibility[4] Cooling Tower Plume	Visual Impact[2]	Comments
Residences near 180th Street and 40th Avenue	SE	0.64	M-H	MAJ	M	M	M-H	M	Emission stack will not skyline the landscape.
Residences near 184th Street and 50th Avenue	SW	0.24	M-H	MAJ	M	M	M-H	M	Project does not affect view Mt. Rainier.
38th Avenue	ESE	0.73	L-M	MAJ	L	L	M	L-M	Duration of visibility of major project facilities will be minimal
Canyon Road	W	0.34	L	DD	L-M	L-M	M-H	M	Visual contrast will be an additive impact to the existing disturbed landscape condition
Mt. Rainier (Round Pass)	WNW	25.0-30.0	H	MIN	NV	NV	NV	NV	Project not visible from any road or road area in the Park.
Mt. Rainier (Wonderland Trail)	WNW	+/-27.0	H	MIN	NV-L	L	L-M	L	Existing structure or man-made features potentially distinguishable along segments of the trail include the Boeing Aviation plant, smoke emissions and cooling tower plumes.

1 S - South, W - West, N - North, E - East
2 L - Low, M - Moderate, H - High
3 Min - Minimal Disturbance, Maj - Major Disturbance, DD - Drastic Disturbance
4 NV - Not Visible, L - Low, M - Moderate, H - High

Mitigation Measures

The following mitigation measures are suggested to reduce visual impacts:

VQ1-1 Disturbance of the site could be minimized. During construction, clearing of land for project facilities or structures, could use curvilinear boundaries where practicable instead of straight lines. Grading could be done in a manner which would minimize erosion and conform to the natural topography. The clearing of trees and vegetation for the project facilities could be limited to the minimum area required. To the extent practicable, all foliage, particularly the clusters of coniferous trees adjacent to the project site, could remain undisturbed to provide maximum screening of the installation.

Brush or small trees cleared and not otherwise disposed of could

be spread in a way to provide cover habitat for small mammals, reptiles and birds. Woody materials could be randomly placed in areas to conform to adjacent vegetation patterns. All timber and other vegetation material without value could be mechanically chipped and spread in a manner that would aid seedling establishment and soil stabilization.

Soil which has been excavated during construction and not used could be evenly backfilled into the cleared area. The soil could be graded to conform with the terrain and the adjacent landscape.

VQ1-2 Simplified structures and coverings could be used to enhance the overall appearance of the project area facilities. Landscaping could be applied in highly visible or sensitive areas to enhance the appearance of the power plant. Selection of trees and other plant materials for landscaping could blend with existing vegetation types and patterns.

Consideration could be given to coloring of facilities structures to blend with the landscape; specifically:

- y The colors should be uniform and non-contrasting to reduce contrast with their background. The warmest color tones should be considered for natural settings.
- y Exposed concrete color should match surrounding soil color.
- y Unless specified otherwise, colors should be selected on the basis of their ability to blend with the land and not the sky.
- y The emission stack should be effectively colored to help reduce its vertical dominance. The portion of the stack below skyline should be colored to match predominant landscape color. Above skyline, lighter color tones should be considered.
- y Project facilities should be painted a shade darker than the adjacent landscape to compensate for the effects of shade and shadow.
- y Paint finishes with low levels of reflectivity (i.e., flat or semi-gloss) should be used.
- y Colors equivalent to the Munsell Soil Color Coding System and displayed on the Standard Environmental Color Chart should be considered for all project facilities.

VQ1-3 Exterior night lighting for project facilities could minimize reflective glow to adjacent landowners.

Impact VQ2 The proposed power plant could impair views from Mount Rainier National Park.

Impacts

The project would not be visible from any roaded location in Mt. Rainier National Park. The cooling tower plume may be visible from certain hiking trails located higher on the mountain. This plume would not draw visual attention from the Park. From the Park, the viewshed, which includes the project, contains hundreds of square kilometers (square miles) of landscape; a significant part of which has been modified. Plumes of other stack emissions cooling towers and timber slash burns are presently part of the scene. The project's cooling tower plume itself would not draw visual attention.

Mitigation Measures

No mitigation measures are suggested.

Impact VQ3 Proposed changes to the BPA South Tacoma switching station could alter visual quality within the existing facility.

Impacts

Visual effects from proposed alterations and additions to the existing switching station, including electrical and communication facilities, would create a low, long-term, additive impact to the visual aesthetic resources in the facility. The switching station currently contains a number of major landscape disturbances, including transmission lines and a series of transmission line poles. Addition of structures, including transmission lines, circuit breakers, disconnect switches, and a control house, and the expansion of the existing substation by approximately 0.07 hectare (0.17 acre) present a minor impact. The landscape at the proposed substation location has been greatly disturbed by the introduction of blocky structures and the removal of vegetation. Addition of structures to the existing switching station will be relatively imperceptible and will present only minor impacts.

Mitigation Measures

VQ3-1 Consideration should be given to coloring of facilities to blend with landscape as outlined in VQ1 through VQ3.

VQ3-2 Exterior lighting for project facilities could minimize reflective glow to adjacent landowners.

VQ3-3 Project facilities could be clustered as closely as possible to existing substation structures in order to concentrate disturbance in one area.

VQ3-4 Landscaping of vegetation could be used around the perimeter of the project to decrease visibility of proposed industrial structures.

5.14 PROJECT DESIGN FeaTURES FOR REDUCING ENVIRONMENTAL IMPACTS

Throughout Section 5.0, "Environmental Consequences," the indication "no mitigation measures are suggested beyond those built into the project" is given for a number of impacts. This determination is based on the project design which incorporated, to the extent practicable, measures to eliminate or avoid potential environmental impacts. The following is a summary of those measures by resource type.

- y Geology/Soils: A minimum amount of soil would be disturbed outside of the project footprint; all structures will conform with building standards for seismic risk in the project region.

- y Air Quality: Implementation of BACT - the combustion of natural gas or low-sulphur No. 2 fuel oil (in emergency cases) in combination with various emission reduction equipment, including low-NoX and de-NoX filters.

- y Water Quality: Discharge of process and cooling waste water to the municipal sewer for treatment; hazardous materials would be stored according to code and protected from possible spill/leakage. All storm water from storms less than the 100-year return period storm would be stored on the site.

- y Energy and Utilities: The project would operate almost 100 percent of the time, thus maximizing efficiency. The most efficient combustion turbine design will be utilized.

- y Biology: The footprint of the proposed power plant has been situated to avoid the stand of Douglas fir in the southeastern portion of the site and preserve as much quality habitat as possible. Trees situated throughout the site would be avoided to the extent practicable; portions of the site will be landscaped after construction. Disturbed Aster curtus populations will be transplanted.

- y Land Use: The project has been situated in an area zoned for light and heavy industry and does not interfere with more sensitive land uses (e.g., residential areas or open space).

- y Public Health and Safety: All transmission lines would be constructed in accordance with the NESC. All underground lines would be clearly marked to avoid cutting into them and would be pressure tested at all times to monitor for leakage. There would be power plant isolation valves which could be closed in the event of an emergency at all gas and liquid inlets. In addition, there would be safety valves throughout the facility that would release high pressure liquids or gases before the possibility of an explosion. All gases and liquids vented in this manner would be distributed to a predetermined safe location for release (Chuck Eliason, Tenaska, pers. comm., 1993).

- y Noise: Power plant facilities would be housed in structures serving as an acoustical barrier, reducing noise emissions.

- y Visual Quality: A large portion of trees would be left surrounding the power plant in order to screen as much of the plant as possible from surrounding viewpoints; portions of the power plant perimeter would be landscaped with trees.

5.15 SIGNIFICANT ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

No significant adverse impacts were identified. The majority of impacts identified were determined to be minor. Other, more substantial impacts were prevented by incorporating environmental protection features into the project design and operation plan.

5.16 RELATIONSHIP BETWEEN SHORT TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Analysis of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity, and irreversible or irretrievable commitments of resources is described in Regulations for Implementing the Procedural Provisions of the NEPA (40 C.F.R. Section 1502.16) (CEQ, 1978). Discussion of these topics in the environmental document should include the following subjects:

- Direct and indirect effects of the proposed project and their significance.
- Conflicts between the proposed action and objectives of other agencies (Federal, state, regional and local) in terms of local land use plans and policies
- Environmental effects and recommended mitigation measures for all alternatives of the proposed project.
- Urban quality, historic and cultural resources and design of the built area, including reuse and conservation potential of various alternatives and mitigation measures.
- Energy and natural or depletable resource requirements and conservation potential for the various alternatives and mitigation measures.

The first four topics listed above are discussed in Sections 3.0 and 5.0 and are not addressed below. The fifth topic, energy and natural resources conservation for the various alternatives, is addressed below.

The proposed Tenaska Washington II project was selected for consideration by BPA out of 116 resource proposals because it offered the potential of providing a balance between cost, technical feasibility, and environmental impacts. BPA considers natural-gas fired combustion turbines for energy generation as simple, reliable, and relatively easy to site. In addition, they offer a relatively clean-burning fuel source. The proposed project would use a highly efficient, combined cycle combustion turbine to provide maximum power output.

5.17 IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES

In addition to short-term uses and long-term productivity of the environment, project construction would result in direct and indirect commitments of resources. Project construction would require the commitment of building materials for construction of the proposed generation facility, such as concrete, steel, wood, and specific project equipment such as the turbines. Materials which could be re-used or recycled would be salvaged during decommissioning of the power plant.

Project construction and operation would also require the use of fossil fuels, electrical energy, water, and other resources over the life of the proposed project. The project will use approximately 1.3 million cubic meters (45 million cubic feet) of natural gas per day and approximately 6.8 million liters (1.8 million gallons) of water per day. The amounts of these resources to be consumed cannot be accurately determined at this time, because total operating days are not known, and should be considered irretrievable and irreversibly committed to the proposed project.

5.18 CUMULATIVE IMPACTS

Cumulative impacts refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

The Frederickson Industrial Area, as the name implies, is an area intended to be developed for industrial and manufacturing purposes. As additional industries choose to establish facilities in this area, cumulative environmental impacts will become greater in the region. The largest anticipated growth from industry in this area will be from the Boeing expansion expected to employ over 11,000 people per day by the year 2010. It is expected that traffic and associated congestion problems will increase, biological resources (vegetation, wildlife, wetland, and other possible resources) will diminish, and that air quality and the noise environment will be degraded by increased vehicle traffic and industrial activity. In addition, impacts may occur to visual resources and ground water quality.

With respect to air quality, the emissions from the proposed project would not significantly affect the area's ability to meet air quality standards in the future. The area is only marginally in nonattainment for carbon monoxide and ozone. The Washington DOE is developing programs to reduce the emissions of nonattainment pollutants and their precursors. These programs focus on vehicular emissions as the dominant source of nonattainment pollutants.

The proposed project would add to regional impacts in an incremental fashion as described by resource topic in Sections 3.0 and 5.0. However, these incremental impacts would be modest, relative to other existing and planned facilities in the region.

5.19 IMPACTS OF ALTERNATIVES TO THE PROPOSED ACTION

5.19.1 No Action

Under the No Action alternative, BPA would not acquire power from the Tenaska Washington II project to meet the anticipated needs of BPA. And since no action would be taken, there would be no environmental impacts.

5.19.2 Other Actions

Since the proposed action would reduce, but not eliminate BPA's need for power, other resources would likely be considered independent of the proposed action and the pilot acquisition program. Other resource types potentially available to meet future loads include the following:

- Conservation (commercial, residential, and industrial)
- Renewables (hydropower, geothermal, wind, and solar)
- Cogeneration
- Combustion turbines
- Nuclear power
- Coal and clean coal

To comparatively evaluate these resource types, BPA has prepared a Resource Programs eis
which was published final in February 1993. The environmental effects of each resource type are discussed in detail in the Resource Programs eis (see Section 2.2).





6.0 ENVIRONMENTAL CONSULTATION, REVIEW, AND PERMIT REQUIREMENTS

A number of Federal and state environmental laws, executive orders and administrative mandates must be met by the proposed Tenaska Washington II project. The following provides a description of relevant regulatory requirements and issues of environmental policy, and a summary of required permits.

6.1 ENVIRONMENTAL POLICY

6.1.1 National Environmental Policy Act (NEPA)

NEPA is a national charter for protection of the environment. NEPA applies to all Federal projects or projects that require Federal involvement. BPA's potential purchase of power from Tenaska requires that BPA assess the potential environmental effects of the proposed project and describe them in an Environmental Impact Statement (eis). This eis for the Tenaska Washington II project was prepared to satisfy NEPA requirements.

6.1.2 Washington State Environmental Policy Act (SEPA)

SEPA (43.21C RCW) is Washington's functional equivalent of NEPA. It is intended to help state and local government decision-makers consider environmental values when reviewing proposed projects. SEPA contains specific policies and goals which apply to action at all levels of state government, except the judiciary branch and the state legislature. SEPA has four primary purposes listed: to declare a state policy which will encourage productive and enjoyable harmony between people and their environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere; to stimulate the health and welfare of people; and to enrich the understanding of ecological systems and natural resources important to the state and the nation.

The SEPA process begins when a permit application is submitted to an agency or when an agency proposes to undertake an official action. Prior to taking any action (issuing permits or approvals) on a nonexempt project, agencies must follow specific procedures to make sure that appropriate consideration has been given to the environment. The severity of potential environmental impacts associated with a proposed action would determine whether a state eis is required.

Because many projects require both state and Federal actions, both NEPA and SEPA apply. In order to avoid duplication of effort, SEPA rules allow the adoption of a Federal eis to satisfy the SEPA requirements. In the case of the Tenaska Washington II project, the state lead agency, Pierce County would satisfy SEPA by adopting the Federal eis after the county has performed its own review of the document. Pierce County would not take action on the project until seven days after it issues an "adoption form".

6.2 THReaTENED AND ENDANGERED SPECIES AND CRITICAL HABITAT

The Endangered Species Act (16 U.S.C. 1536) provides for conserving threatened and endangered species of wildlife and plants. Federal agencies must ensure that the proposed action does not jeopardize the continued existence of any endangered or threatened species, or cause the destruction or adverse modification of their critical habitat. Sources of information for the potential occurrence of sensitive species in an area include both Federal and state lists.

A letter was sent to the USFWS requesting a list of threatened and endangered species in the

vicinity of the proposed power plant. No listed species occur at the site. However, a recent survey determined the presence of a population of white-top aster (Aster curtus), a Federal candidate species (C2) (Salix Associates, 1993). White-top aster is designated as sensitive by the State of Washington (1990). Potential impacts of the proposed project and its alternatives on listed species are discussed in Section 5.5.

6.3 FISH AND WILDLIFE CONSERVATION

The Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901 et. seq.) encourages Federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitats. The Fish and Wildlife Coordination Act (16 U.S.C. 661 et. seq.) requires Federal agencies undertaking projects affecting water resources to consult with the USFWS and the state agency responsible for fish and wildlife resources to conserve or improve wildlife resources. Water resources that promote fish and wildlife habitat have not been identified at the proposed Tenaska Washington II project site.

6.4 HERITAGE CONSERVATION

Congress has passed many Federal laws to protect the nation's historical, cultural, and prehistoric resources. These include the NHPA, the Archaeological Resources Protection Act, the American Indian Religious Freedom Act, the National Landmarks Program, and the World Heritage List. A cultural resource is an object, structure, building, site, or district that provides irreplaceable evidence of natural or human history of national, state, or local significance. Cultural resources include National Landmarks, Natural Landmarks, archaeological sites, and properties listed (or eligible for listing) on the NRHP.

Construction projects such as Tenaska Washington II could affect historic properties and other cultural resources. An archival search and field survey were conducted by Tenaska as described in Sections 4.7 and 5.7. No cultural resources were identified or discovered. A copy of the cultural resources survey report has been sent to the Washington State Historic Preservation Office.

6.5 STATE, AREa-WIDE, AND LOCAL PLAN AND PROGRAM CONSISTENCY

6.5.1 Land Use

Pierce County's 1962 Generalized Comprehensive Plan directs land use into specific zones; for example, the 1962 Plan encourages the development of shopping and service facilities to meet the needs of the "Suburban Residential" zone. Pierce County is currently revising the 1962 Plan to conform to the 1990 Growth Management Act. The revised plan is expected to be adopted by July 1994.

The proposed Tenaska Washington II project would alter land use at the site from vacant to industrial use. The site is located within an area zoned for heavy industrial use, thus, the project would be consistent with prevailing land use designations.

6.5.2 Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act)

The Pacific Northwest Electric Power and Conservation Planning Council (Council) has been established according to the Northwest Power Act (Pub.L. No. 96-501). The goal of the Council's 1991 Northwest Conservation and Electric Power Plan (Plan) is to "assure the Pacific Northwest of an adequate, efficient, economical and reliable power supply" (Council, 1991). One of the Council's authorities is a Section 6(c) review, as directed in the Northwest Power Act (16 U.S.C. Sections 839-839h) (Supp. V 1981). Section 6(c) requires both the BPA Administrator and the Council to determine that a project of at least 50 aMW and 5-years duration is consistent with the Plan. BPA has conducted a formal review pursuant to Section 6(c) of the Northwest Power Act. The BPA administrator has determined that the proposal to acquire up to 240 aMW of firm energy from the Tenaska Washington II project is consistent with the Northwest Power Plan. The Council found by unanimous vote that the proposal is consistent with the Northwest Power Plan.

6.5.3 Notice to the Federal Aviation Administration (FAA)

Construction of tall facilities requires that notice be given to the FAA, specifically, any facility

61 meters (200 feet) or taller above ground level. No structures exceeding 61 meters (200 feet) are planned at the Tenaska Washington II project.

Additionally, proximity of a proposed facility to an airport requires that notice be given to the FAA. The closest airport to the proposed project is Thun Field Airport, located roughly 4.8 kilometers (3 miles) due east of the site. A second airport, Spanaway Airport, lies 5.1 kilometers (3.2 miles) due west of the site. Both of these airports are of sufficient distance from the proposed site that any airplanes approaching for landing or taking off would be required to be at a minimum of 300 meters (1000 feet) over the site. This elevation would preclude any potential impacts to airplanes from the discharge of hot gases from the power plant stack which would not rise more than 15-30 meters (50-100 feet) from its point of discharge to the air (Chuck Eliason, Tenaska, pers. comm., 1993.) There is also a small airstrip approximately 1,219 meters (4,000 feet) south of the proposed plant site.

The McChord Air Force Base is located approximately 10 kilometers (6 miles) northwest of the proposed site. Aircraft approaching and taking off from this base would not be affected by the proposed power plant's facilities and no regulation would apply.

6.5.4 Construction-Related Permits

Grading, building, and related permits would be required from Pierce County. The County Department of Permits and Land Services regulates development activities via Ordinance No. 90-132, Site Development Regulations.

6.6 COASTAL ZONE MANAGEMENT PROGRAM CONSISTENCY

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

6.7 FLOODPLAINS

The project site is not within in a floodplain or area which is susceptible to flooding.

6.8 WETLANDS

A review of NWI maps and a field survey for the potential presence of jurisdictional wetlands resulted in finding no wetlands at the project site. Thus, construction at the Tenaska Washington II power plant site would not require permits for alteration of wetlands under Section 404 of the Clean Water Act or the Washington Shoreline Management Act.

6.9 FARMLANDS

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

The site is currently vacant and zoned for heavy industrial use. The SCS indicated that no prime or unique farmland exists at the site.

6.10 RECReaTION RESOURCES

No public recreation occurs at the proposed project site as it is privately owned and zoned for Heavy Industrial use. It is unlikely that the proposed project would interfere with the present use of any recreation resource in the vicinity.

6.11 GLOBAL WARMING

Several additional greenhouse gases would be emitted by the proposed project. These may include CO2 and criteria air pollutants (Federally regulated) such as NOx, PM10, and VOCs. Emission levels of these gases by the proposed project would be below the PSAPCA's threshold standards for both emissions and ambient air quality. No permit requirements currently exist specially for greenhouse gases.

6.12 PERMIT FOR STRUCTURES IN NAVIGABLE WATERS

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

6.13 PERMIT FOR DISCHARGES INTO WATERS OF THE UNITED STATES

Discharge of dredged or fill material into waters of the United States is regulated by the Army Corps of Engineers pursuant to Section 404 of the Clean Water Act. The proposed project is located in an upland area and there is no proposed discharge of dredged or fill materials into waters of the United States.

6.14 PERMIT FOR RIGHT-OF-WAY ON PUBLIC LANDS

The proposed project would be located on private land.

6.15 ENERGY CONSERVATION AT FEDERAL FACILITIES

The proposed project does not include the operation, maintenance, or retrofit of an existing Federal building, or the construction or lease of a new Federal building.

6.16 POLLUTION CONTROL

6.16.1 Air

The Clean Air Act is the principal Federal law governing air pollution control. It was most recently amended in 1990. In the project area, authority for ensuring compliance with the provisions of the Clean Air Act is delegated to the PSAPCA. Emissions produced by the proposed Tenaska Washington II project must meet standards established by that agency. The Tenaska Washington II project would comply with all applicable standards as described in Section 5.4.

6.16.2 Water

The Clean Water Act, as amended, is the principal Federal law governing water pollution control. The Clean Water Act was passed in 1972 and amended in 1977 and 1987. Currently it is undergoing review and is expected to be formally amended in either 1993 or 1994. The Clean Water Act authorizes Federal and state regulation of discharges into waters of the United States and municipal sewer systems. The primary instrument for implementing the Clean Water Act is the NPDES. An NPDES permit would not be required for discharging storm water from the proposed project, as determined by the Washington DOE. A combination of design features and operating practices will, however, be implemented at the Tenaska Washington II power plant site to prevent or reduce storm water pollution.

Washington State has adopted groundwater quality standards (WAC 173-200) that the Washington DOE is authorized to administer. A storm water management plan that meets these standards would be implemented by Tenaska. Other regulatory requirements related to potential groundwater contamination by hazardous materials are addressed in Section 4.9. These include the Preparedness and Prevention measures, Contingency Plan, and Spill Prevention Control Countermeasure Plan, which would be submitted to Ecology for review and to the Tacoma-Pierce County Health Department for approval of compliance with regulatory requirements.

The only aqueous wastes generated at the proposed site would be sanitary sewage and cooling tower blowdown. Both would be discharged to the Pierce County sewage system. Compliance with the Clean Water Act requirements for discharge of these wastewaters to the waters of the United States would be the responsibility of Pierce County. Pierce County is currently in compliance with the Clean Water Act requirements.

6.16.3 Solid and Hazardous Waste

6.16.3.1 Solid Waste

Solid waste generated at the proposed project site would consist mostly of packing crates, wastes from maintenance, and wastes from normal employee activities. It would probably be collected by LeMay Disposal for disposal at the Land Recovery Municipal Landfill.

6.16.3.2 Hazardous Waste

Management of hazardous wastes during construction and operation of the proposed power plant are discussed in Section 5.9. The Washington DOE is the primary agency responsible for regulation of hazardous and dangerous wastes in the state. A Dangerous Waste Permit from the Washington DOE may be required for the treatment, storage and disposal of dangerous waste. Under the Washington State Dangerous Waste Regulations (173-303 WAC) the Washington DOE implements the State's Hazardous Waste Management Act and parts of the RCRA. In Washington, dangerous wastes are defined to include EPA-identified hazardous wastes, as well as additional wastes that are regulated in Washington because they are toxic, persistent in the environment, or carcinogenic.

Environmental review requirements concerning hazardous waste would include preparing Preparedness and Prevention Measures, Contingency Plan, and Spill Prevention Control Countermeasure Plan documents for submittal to the Washington DOE and Tacoma-Pierce County Health Department.

6.16.4 Safe Drinking Water

The proposed project would receive its drinking water from TPU which is obligated to comply with the provisions of the Safe Drinking Act.

The Federal Sole Source Aquifer program is designed to protect aquifers that supply 50 percent or more of the drinking water for a given area and for which there are no reasonably available alternative sources should the aquifer become contaminated. The program requires EPA review of any Federally funded project for protection of groundwater if a sole source aquifer exists in the area. The Clover-Chambers Creek Basin aquifer system was formally designated as a sole source aquifer on December 9, 1993.

The proposed project would comply with Federal, state, and local regulations regarding contamination prevention of surface and ground waters.

6.16.5 Noise

The proposed project is subject to maximum allowable levels of noise by Pierce County ordinance and state law (WAC 173-63), as measured at the property line of adjacent occupied land. As discussed in Section 5.12, regular operation of the proposed project would comply with noise standards for adjacent industrial and residential property. Potential noise-related impacts
of project construction and suggested mitigation measures are discussed in Section 5.12.

6.16.6 Pesticides

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

6.16.7 Toxic Substances Control Act (TSCA)

The TSCA requires notification to EPA of new chemicals and regulates the production, use, and disposal of toxic substances. Of particular interest to the production of electricity is the regulation of polychlorinated biphenyls (PCBs). EPA banned the manufacture, processing, distribution in commerce, and use of PCBs on January 1, 1978 except in totally enclosed electrical equipment or under specific authorized uses.

The proposed project would not involve the distribution, use, or disposal of PCBs.

6.16.8 Asbestos

There would be no asbestos used in the proposed project.

6.16.9 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

A Phase I Environmental Site Assessment was completed for the proposed project site which indicated that no hazardous materials are present at the site. A study that included groundwater monitoring was completed for a site located adjacent to and south of the proposed Tenaska site, which found no elevated levels of hazardous materials. These studies suggest that the proposed

project would not involve liability for clean-up of past or present hazardous wastes at the site or
involve selling or transferring real property where any type of activity relating to hazardous substances has occurred.

6.16.10 Radon

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

6.17 PERMITS

Permits would need to be obtained from a number of agencies before power plant construction and operation could begin. It is known that development of the proposed project would require the following Federal, state, or local permits:

- New Source Review and the subsequent permits, including the Air Toxics Emission Permit/Operating Permit for emitting pollutants into the air from the PSAPCA.
- Grading and building permits from Pierce County.
- Review per Section 309 of the Clean Air Act by the EPA.
- Industrial Waste Discharge Permit from the Washington DOE.
- Natural Gas Import Authorizations from the FERC.
- Determination of Exempt Wholesale Generator from the FERC.
- Critical Area Review by Pierce County.
- NPDES storm water permit for construction (NPDES storm water permit for operation is not required).

Possible permits that may need to be obtained for development of the proposed project include the following:

- RCRA compliance (administered by the Washington DOE).
- Dangerous Waste Permit for Treatment, Storage, and/or Disposal from the Washington DOE.
- Special Motor Vehicle Permit for any over-weight or over-sized vehicle from the Washington Department of Transportation.
- Miscellaneous local permits for operating a commercial or private business.
- Encroachment permits from Chehalis Western Railroad and Pierce County.

7.0 LIST OF PREPARERS

7.1 REPORT AUTHORS

Preparer	Experience and Expertise
Nandranie Tuck Project eis Manager	B.S. Geography Graduate coursework in environmental sciences and natural resources laws and policies, 5 years teaching ecology and earth sciences, 11 years environmental analysis and project management; NEPA compliance and facility siting; field research and policy analysis of wetlands, land use and water use.
Ronald H. Holeman Project Manager	Mathematics/Engineering 29 years of experience Research, Development & Demonstration, including technical analysis of conventional thermal and renewable generation resources, project management.
Roxane J. Freeman eis Reviewer	B.A. Economics; J.D. Financial analysis, contract drafting and negotiations.
Randall Leonard Engineering Coordinator Utility Systems & Applications, Inc.	M.S., Wildlife and Range Resources 12 years of experience NEPA compliance, project management, environmental and engineering planning, resources analysis, applied research.
Jon French Engineering and Transmission Issues	B.S. Electrical Engineering, P.E. Oregon 22 years experience High voltage transmission, substation design, project management, system planning.
Preparer	**Experience and Expertise**
Colleen Spiering Electric and Magnetic Effects	Master of Public Health 18 years experience Environmental compliance, public involvement, health related EMF analysis, health education.

Other project support, both technical and in report preparation, was provided by staff at Woodward-Clyde Consultants and Bonneville Power Administration. The air quality studies were overseen by William Steiner of Woodward-Clyde Consultants, in Oakland, California. The archaeology study was performed by J. Scott King of Historical Research Associates, Inc., in Seattle, Washington. The noise study was performed by Michael R. Yantis Associates, Inc., of Bellevue, Washington.

7.2 PERSONS CONSULTED

Chambers Creek Wastewater Treatment Plant
Jim Landan, Chief Operator, April 21, 1993.

City of Tacoma Public Utilities Department
Staff

Washington Department of Ecology
Burt Bowen, Groundwater Section; March 25, 1993.
Kurt Cook, Groundwater Section.
Pat Hartigan, Storm Water Section.

Gary Kruger, Environmentalist III, Storm Water Division; March 24, 1993.
Helen Presley, Storm Water Section.

U.S. Environmental Protection Agency (EPA)
Dru Keenan, State Groundwater Protection Coordinator; March 23, 1993.
Johnathan Williams.

Mount Rainier National Park, Washington
Staff

Pierce County
Sally Sherard.
Janine Redmond.
Phil Pinard.

Pierce County Solid Waste Management Department
Staff

Pierce County Utilities
Steve Elseth, Principal Engineer, Water Division; March 23, 1993.
Jane Evancho, Resource Planning Coordinator, Water Quality Division; March 29, 1992.
Robin Ordonez; March, 1993.

Soil Conservation Service
James (Skippy) Moore, District Conservationist; March 26, 1993.

Tacoma-Pierce County Chamber of Commerce
Gary Bracket.

Tenaska Washington Partners II, L.P.
Chuck Eliason, Engineer; March 11, 1993.
David Johnson; January, 1993.
Mike Lebens; March, 1993.

U.S Department of Fish and Wildlife
Michelle Eames, Biologist; March 23, 1991.

Washington Department of Wildlife
Lea Knutsen, Biologist; February 3, 1993.

    

8.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

FEDERAL AGENCIES
Advisory Council on Historic Preservation (ACHP)
Argonne National Laboratory
Federal Energy Regulatory Commission (FERC)
National Park Service (NPS)
Pacific Northwest Electric Power and Conservation Planning Council
U.S. Soil Conservation Service (SCS)
U.S. Environmental Protection Agency (EPA)
U.S. Fish and Wildlife Service (USFWS)
U.S. Army Corps of Engineers (Corps)
U.S. Geological Survey (USGS)
STATE OF WASHINGTON
Department of Natural Resources
Department of Transportation
Department of Health
Department of Fisheries
Department of Ecology
Department of Wildlife
Energy Facility Site Evaluation Council
Parks and Recreation Commission
Puget Sound Air Pollution Control Agency
Washington State Office of Archaeology and Historic Preservation
LOCAL
City of Tacoma
City of Tacoma Department of Utilities Water Division
City of Tacoma Public Utilities
Local 82 Plumbers Union and Pipefitters Union
Pierce County Fire Department
Pierce County Library
Pierce County Protection
Pierce County Planning Department
Pierce County Public Works
Port of Tacoma
Puget Power and Light
Puyallup Chamber of Commerce
Seattle City Light
Tacoma City Light
Tacoma Public Utilities

TRIBES
Muckleshoot Indian Tribe
Nisqually Tribe: Planning Office
Puyallup Tribe: Environmental Planner
Fisheries Biologist
Director, Land Use Department

REGIONAL DEPOSITORY LIBRARIES
University of Moscow Library
Moscow, Idaho

University of Montana
Maurene and Mike Mansfield Library
Missoula, Montana

Portland State University
Millar Library
Portland, Oregon

Washington State Library
Olympia, Washington

Nevada State Library
Carson, Nevada

San Francisco Public Library
San Francisco, California

State of California Regional Depository Library
Sacramento, California

State of Oregon Library
Salem, Oregon

STATE DEPOSITORY LIBRARIES
Bellevue Public Library

Everett Public Library

Bellevue, Washington

Western Washington University
Mable Zoe Wilson Library
Bellingham, Washington

Eastern Washington University
JFK Library
Cheney, Washington

Highline Community Collegei Library
Des Moines, Washington

Central Washington University
Library
Ellensburg, Washington

University of Washington
Suzzallo Library
Seattle, Washington

University of Washington
Marian Gould Gallagher Law
Seattle, Washington

U.S. Court of Appeals
9th Circuit Library
Seattle, Washington

Gonzaga University
School of Law Library
Spokane, Washington

Everett, Washington

Evergreen State College
Daniel J. Evans Library
Olympia, Washington

North Olympic Library System
Port Angeles, Washington

Washington State University
Holland Library
Pullman, Washington

Seattle Public Library
Seattle, Washington

Spokane Public Library
Spokane, Washington

Tacoma Public Library
Tacoma, Washington

University of Puget Sound
Collins Memorial Library
Tacoma, Washington

Port Vancouver Regional Library
Vancouver, Washington

Whitman College
Penrose Memorial Library
Walla Walla, Washington

OTHER INTERESTED ORGANIZATIONS

Air Products and Chemicals
Alcan Aluminum Ltd.
AMA Timber Products
Building & Construction
Carpenters Employers
CE Exploration
Central Lincoln PUD
Century Contractors West
City Club of Tacoma
Eatonville Chamber of Commerce
EBASCO Environmental
Economic Development Board
Tacoma and Pierce County
Emergency Medical Services
Environmental Dynamics
FCCCC
GE Bridges & Associates
General Electric
General Electric
Graham Grange No. 962
Graham Greater Business
Graystone
Great Northwest Taxi
HDR Engineering
Independent Power

Zurn Industries
Zurn/Nepco
29th District Republicans
2nd District Democrats

League of Women Voters
Leslie Associates
National Electrical
NE Energy
Northwest Pipeline Co.
Northwest Pallet
Northwest Power Planning Council members
and offices
Olympic Pipe Line Co.
Parametrix Inc.
Pomona Grange
Puget Sound Power & Light
Puyallup Rotary
Rand-Land Investment
Randles Sand & Gravel
Seattle City Light
STRA
SW Research Institute
Tacoma Audubon Society
Taylor Economic Research
Tenaska Washington Partners II, L.P.
Trexler & Associates
U.S. Ostermann
Vulcan Power Company
Washington Environmental

INDIVIDUALS

P. Acheff
R. Allen
J. Amell
D. Amick
D. Anderson
P. Blaydes
F. Bowers
R. Boyd
P. Bradley
N. Brown
L. Brown
J. Carr
B. Hannaford/J. King
R. Huddleston
H. Iverson
W. Johnson
M. Johnson
D. Kaiser
H. Kaneshiro Jr.
R. Killingbeck
E. Kindell
J. Klippert
J. Knight
L. LaPlante
M. Ramsey
L. Randles
J. Randles
W. Reichel
D. Rennie
E. Ruediger
J. Sherwood
R. Shuey
J. Smith
G. Sprague
S. Steinborn
L. Taylor

K. Cathpole	A. Lawler	B. Thomas
E. Chambers III	S. Lay	D. Tyler
H. Chambers	H. Legault	L. Walle
E. Chambers Jr.	W. Lively	E. Wallgramm
G. Christman	T. Lockwood	W. Weber
R. Cisco	P. Lowe	E. Weed
G. Cisco	M. Martinez	R. Westby
T. Cook	S. Mathes	W. Wilcox
S. Cross	C. McCann	S. Wonacott
W. Desjardins	G. McNally	B. Worley
K. Engels	S. Muchelston	D. Zahnon
G. Friesz	S. Page	D. Zorko
I. Gabrielson	M. Raden	R. Zuver

    

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10.0 GLOSSARY

Adsorption	**The accumulation of a material at the interface between two physical phases, for example, materials that are removed from water onto soil particles.**
Alluvial deposits	**Material such as sand or silt, deposited on land by streams.**
Aquifer	**A geologic formation or structure that contains and transmits water in sufficient quantity to supply the needs for water development. Aquifers are usually saturated sands, gravel, or fractured rock.**
BACT	**Best Available Control Technology**
Best Management Practices	**A practice or combination of practices that are the most effective and practical means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.**
Biofiltration swale	**The use of natural materials and vegetation to trap and remove pollutants from water using a shallow drainage ditch.**
Circuit breakers	**A switching devise that is capable of closing or interrupting an electrical circuit under over-load or short-circuit conditions as well as under normal load conditions.**

Control and protective relaying	**Protective relays are electrical devices designed to interpret input conditions (which reflect the operation of another piece of equipment) in a prescribed manner, and, after specified conditions are met, to respond by controlling equipment operation to protect an electrical circuit. For example, controlling the opening of a power circuit breaker when a fault occurs to protect the circuit from extensive damage.**
Criteria Pollutant	**Any one of six pollutants (nitrogen oxides [as NO2], carbon monoxide [CO], ozone [O3], sulfur oxides [as SO2], fine particulate matter [PM10], and lead [Pb]) that is regulated under the Clean Air Act. These pollutants have National Ambient Air Quality Standards (NAAQS) established using guidelines based on human health and welfare.**
Deis	**Draft Environmental Impact Statement.**
Disconnect switches	**A power system switch used to open a circuit in which only a negligible amount of current, or no current, is flowing. Disconnect switches are typically manually or motor operated and are not used to interrupt a circuit under load.**
eis	**Environmental Impact Statement.**
Electric Field	**An energy field produced by voltage, measured in**

	kilovolts per meter.
Evapotranspiration through evaporation transpiration by plants.	Loss of water to the atmosphere (loss from wet surfaces) and
Feis	Final Environmental Impact Statement.
Gleization iron) in saturated causes the soil to exhibit mottling (bright	A chemical reduction process (of and/or nearly saturated soils which appear grayish in color and/or colored spots in the soil).
Geologic hazard or man-made, that property, e.g.,	A geologic condition, either natural poses a potential danger to life and landslides.
Groundwater infiltration system which allows storm water often using crushed stone permeability of the soil.	A bed, ditch, pond or basin runoff to seep into the ground, or gravel to increase the
Habitat individuals of a particular	The environment occupied by species, population or community.
Hazardous materials uncontrolled manner, property, and/or the Checklist for Federal 1981).	Substances which, if released in an can be harmful to people, animals, environment (Planning Guide and Hazardous Materials Contingency Plans, Emergency Management Agency, July
Herpetofauna	Reptiles and amphibians.
Hydric (soil)	A soil that is saturated, flooded, or

ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic (able to grow in saturated areas) vegetation.	
Impact consequences, either positive or negative in desirability, of proposed projects or activities.	Pertains to the environmental
LAER	Lowest Achievable Emission Rate.
Magnetic field An energy field produced by the movement of electrons in a wire (current), measured in milligauss (mG).	
Mitigation Actions to avoid, minimize, reduce, eliminate, or compensate for the impact of a proposed activity or management practice.	
Non-point source Water contaminant that cannot be traced to a specific point of origin, but rather comes from many different non-specific sources.	
NPDES National Pollution Discharge Elimination System.	
PDeis Preliminary Draft Environmental Impact Statement.	
PFeis Preliminary Final Environmental Impact Statement.	
PSAPCA Puget Sound Air Pollution Control Authority.	
Parent material The unconsolidated material from which soil develops.	

Percolation through the soil.	**The downward movement of water**
Profile (soil) extending through different	**A vertical section of the soil layers (horizons).**
Permeability (soil): water to move downward number of water moves	**The quality of soil that enables through the profile, measured as the centimeters (inches) per hour that downward.**
Physiographic province climate that has a surface form) history.	**A region of similar structure and unified geomorphic (pertaining to**
RCRA Act. Federal hazardous waste. implemented through the State Dangerous	**Resource Conservation and Recovery regulations addressing management of In Washington State these are adopted state regulations, Washington Waste Regulations (173-353 WAC).**
RPeis Statement. An that for acquisition.	**Resource Programs Environmental Impact eis prepared by BPA in February 1993 comparatively evaluates resource types**
Runoff irrigation that flows over the or other water from the air or land and	**Water from precipitation or ground surface and returns to streams bodies. It can collect pollutants carry them to the receiving waters.**
Surface water which is above the	**Any water, temporary or permanent, ground surface, observable with the**

unaided eye.	
Total suspended particulates (TSP)	The total volume of small particles suspended in a water column, expressed in percent.
Transpiration	The process in plants by which water vapor is released into the gaseous environment.
Visual quality objective (VQO)	Categories of acceptable landscape alteration measured in degrees of deviation from the natural-appearing landscape.
Volatile organic compounds (VOCs)	Any organic compound containing hydrogen and carbon that has the tendency to react photochemically in the atmosphere and produce smog.
Water table	The upper limit of the soil or underlying rock material that is wholly saturated with water.
Watershed	The area drained by a single river system.

APPENDICES

APPENDIX A COPY OF NOTICE OF INTENT

U.S. DEPARTMENT OF ENERGY
Bonneville Power Administration
Proposed Tenaska Washington II Generation
Competitive Acquisition Project
Notice of Intent to Prepare an Environmental Impact Statement
and Notice of Scoping Meeting

AGENCY: Bonneville Power Administration (BPA), DOE.
ACTION: Notice of Intent to prepare an Environmental Impact Statement (eis) and conduct a Scoping Meeting.
SUMMARY: BPA plans to prepare and consider an eis on its proposal to purchase firm power produced by the proposed Tenaska Washington II Generation Project. This project was proposed by Tenaska Power Partners in response to competitive bidding by BPA. BPA will evaluate the environmental effects associated with the proposed project to aid in its decision whether or not to purchase the power output from the plant.

The proposed project would be located within the Frederickson Industrial Park near Tacoma in Pierce County, Washington. The facility would consist of one General Electric Frame 7FA combustion turbine-generator, one heat recovery steam generator with supplemental firing capability, and onesteam turbine-generator, all together having a nominal output of 240 average megawatts (aMW).

The primary fuel would be natural gas and the back-up fuel would be oil. The natural gas would be delivered by an existing pipeline adjacent to the project site and connected to the facility by a short feeder pipe or stub. The back-up fuel would be delivered to the site by truck and stored on site. A cooling tower would be built on the site to cool the water before it is discharged into the Pierce County Sanitary Sewer System. Water for steam supply and cooling would be purchased from the City of Tacoma.

The electrical power generated at the plant would be sold to BPA for marketing through the regional power grid. In order to connect the proposed generation project to the Bonneville Power transmission system. a new 230-kV line with overhead ground wire, approximately one mile long, would be required. This line would connect the new generation plant to BPA's South Tacoma 230-kV Switching Station. At the South Tacoma Station, BPA would expand and modify existing facilities to include 230-kV power circuit breakers, disconnect switches, control and protective relaying, communications, and a control house. The South Tacoma Station would be tied into the existing White River-Cowlitz Tap-Olympia 230-kV transmission line. Further details of the South Tacoma expansion would be determined during the preliminary and final design stages.
DATES: A public meeting will be held on September 29, 1992, at Bethel High School, 22215 38th Avenue East, Spanaway, Washington, to discuss the scope of the eis for the Tenaska Washington II Generation Project. During the scoping period, BPA is asking the public to identify significant issues that should be considered in the eis. Comments on the scope of the eis should be submitted to the address below by October 30, 1992.

After the scoping period. an Implementation Plan for the eis will be prepared and made available to the public for information. The Draft eis is scheduled to be circulated-for public review and comment in the summer of 1993, and notice as to how copies may be obtained will be published at that time. A public hearing will be held during the 45-day comment period. Copies of the Draft eis will be available from BPA's Area Offices and from BPA's Public Information Center. The Final eis should

be available in the winter of 1993. A Record of Decision is expected to be issued in the spring of 1994.
ADDRESS: Written comments on the scope of the eis should be submitted to the Public Involvement Manager, Bonneville Power Administration, P.O. Box 12999, Portland, Oregon 97212.

FOR FURTHER INFORMATION CONTACT: Ms. Nandranie Tuck, eis Manager at 503-230-4389 or Mr. Charles Al ton, Environmental Coordinator at 503-230-5878, or you may call the Public Involvement Office at 503-230-3478 in Portland; the toll free number is 800-622-4519. Information may also be obtained from:

Mr. George Bell, Lower Columbia Area Manager, Suite 243, 1500 NE. Irving Street, Portland, Oregon 97232, 503-230-4551.

Mr. Robert N. Laffel, Eugene District Manager, Room 2O6, 211 East Seventh Avenue, Eugene, Oregon 97410, 503-465-6592.

Mr. Wayne R. Lee, Upper Columbia Area Manager, Room 561, West 92O Riverside Avenue, Spokane, Washington 99201, 509-353-2515.

Mr. George E. Eskridge, Montana District Manager, 800 Kensington, Mi ssoul a, Montana 59801, 406-329-3060 -

Mr. Ronald K. Rodewald, Wenatchee District Manager, Room 3O7, 301 Yakima Street, Wenatchee, Washington 98801. 509-662-4377, extension 379.

Mr. Terence G. Esvelt, Puget Sound Area Manager, Suite 400, 201 Queen Anne-Avenue North, Seattle, Washington 98109-1030, 206-553-4130.

Mr. Thomas V. Wagenhoffer, Snake River Area Manager, 101 West Poplar, Walla Walla, Washington 99362, 509-522-6226.

Ms. Ruth Bennett, Idaho Fa1ls District Manager (Acting), 1527 Hollipark Drive, Idaho Falls, Idaho 83401, 208-523-0276.

Mr. Thomas H. Blankenship, Boise District Manager, Room 494, 550 West Fort Street, Boise, Idaho 83724, 208-334-9137.

For general information on DOE's NEPA review procedures or status of a NEPA review, contact Carol M. Borgstrom, Director. Office of NEPA Oversight. EH-25, U.S. Department of Energy. 1000 Independence Avenue.

SW, Washington, D.C., 20585: phone (202) 586-4600 or (800) 472-2756.
SUPPLEMENTARY INFORMATION:

Background

BPA is a Federal power marketing agency with statutory responsibilities to supply electrical power to its utility, industrial, and other customers in the Pacific Northwest. According to BPA's current load/resource balance study, the demand for energy now exceeds supply by about 400 aMW. The load/resource balance forecast projects a deficit of l,500 to 2,600 aMW of energy by the year 2000. The underlying need for action is to satisfy BPA's customers' demand for electrical energy.

Guided by the recommendations in BPA's l990 Resource Program, BPA has commenced a dynamic and multifaceted pilot resource acquisition effort to test various approaches for acquiring a diverse portfolio of cost-effective, reliable, and environmentally sound resources. One acquisition approach being tested is an all-source competitive bidding process to acquire about 300 aMW of energy.

In response to BPA's request for proposals under the competitive bidding process, over 100 proposals totalling 5,300 aMW of generation and 116 aMW of conservation energy were submitted.

Through an analysis of system cost, project viability, preliminary environmental evaluation and discussion with the developers BPA has - proposed 17 conservation and 3 generation projects for further consideration and review toward satisfaction of the 300 aMW target. Tenaska and each of the remaining 19 proposals will be evaluated independently as they are neither connected to nor dependent upon each other for their justification. This eis will include at a minimum the no action alternative.

Since the proposed Tenaska project would satisfy only a small portion of SPA's overall energy needs for this decade, whether or not BPA acquires the Tenaska energy output would not foreclose future considerations of other potential energy resources available to BPA through its various acquisition approaches.

Environmental Analysis

The Tenaska Washington II Generation Project would be used as "hydrofirming power" to guarantee the availability of energy from the

hydropower system, which is subject to- fluctuations due to weather variations.

The proposed combustion turbine would be operating as a combined cycle system. This turbine configuration is highly efficient because the waste heat from the turbine exhaust is captured to create steam for the steam turbine generator which also produces electricity.

The use of "cleaner burning" natural gas in combination with steam injection into the turbine and Selective Cata1ytic Reduction (SCR) would significantly reduce air emissions of this combustion turbine The additional SCR and steam injection would reduce nitrous oxide emissions to less than four parts per million (ppm). This is significantly below the current state threshold of 7-9 ppm. Additionally, the developer would fund cost-effective proposals for offsetting carbon dioxide emissions.

The site is designated as "M2'' Heavy Industrial. There is property zoned Suburban-Agricultural (SA-12) within a quarter of a mile from the site. Residential zoned property is one-half mile from the site and is separated from the proposed plant property boundary by an existing railroad line, an oil products pipeline right of way, vacant M2 Heavy

Industrial zoned property, and a 230-kV transmission line corridor. Further from the site are farmers and ra-nchers. Visual, auditory and air quality impacts upon area residents, tree farmers and ranchers will be carefully considered in the environmental analysis.

Issued in Portland, Oregon, on August 31, 1992.

(Sgd) Steven G. Hickok
For Randall W. Hardy
Administrator
Bonneville Power Administration

    

APPENDIX B GEOLOGY, SOILS, AND HYDROLOGY

B.1 GENERAL CHARACTERISTICS

The proposed power plant site is located on an approximately 6.4-hectare (16-acre) parcel of undeveloped land. Topographic relief at the site is moderate and characterized by historical glacial activity. Soils of the area are very permeable, and most rainfall infiltrates rapidly into the groundwater system. Clover Creek and Chambers Creek provide the primary surface drainages for the project site watershed.

B.2 GEOLOGY AND SOILS

B.2.1 Geology

The project site is geographically situated in the northern section of the Puget Trough Province (Puget Sound Basin) of western Washington. This lowland province is bounded on the east by the Cascade Mountains and on the west by the Olympic Mountains and Willapa Hills. Its physiographic and geologic boundary extends north to the Canadian border, and south into Oregon through the Willamette Valley (Franklin and Dyrness, 1988).

Several glaciations, all occurring during the Pleistocene era (2.5 million to 10,000 years before the present), have influenced the geology of the southeastern Puget Sound lowland region (Walters and Kimmel, 1968). The most recent deposits in the region are Vashon deposits, from the Vashon glaciation. The Vashon glacier was the most recent glacier affecting the southern Puget Sound region. Its most southern point was located approximately 16 to 24 kilometers (10 to 15 miles) south of Olympia, Washington. Although this is north of the project site, deposits from glacier melt-water streams are common as far south as Toledo, Washington (Franklin and Dyrness, 1988). These deposits are unconsolidated in nature and consist of mixtures of boulders, cobbles, gravels, sands, silts and clays (Walters and Kimmel, 1968). Parent material for the Vashon deposits include geologic formations in the northern Cascades and the coast range of Canada (Brown and Caldwell, et al., 1985).

The surficial geology of the general area is composed of Vashon recessional outwash. This outwash is a mixture of stratified sand and gravel deposited by melt-water streams during the Vashon glacial retreat, with particle sizes ranging from 0.32 centimeter (one-eighth inch) to approximately 15 centimeters (6 inches) (Walsh, et al., 1987; Battie, et al., 1975). This material is fairly well-sorted and quite permeable, becoming finer in grain and less permeable with increasing distance from the glacier (Brown and Caldwell, 1985). Geologic maps of Washington, including the Southwest Washington Quadrant and the South Half of Tacoma Quadrangle, confirm the presence of Vashon outwash for the site (Walsh, 1987; Walsh, et al., 1987).

Steilacoom Gravel, a specific unit of Vashon recessional outwash deposited by high-velocity streams and rivers occurs over the site. This deposit is composed of coarse gravel (2.5-centimeter [1-inch] pebbles), with sand occurring between gravel particles

(Walters and Kimmel, 1968; Earth Consultants, 1989; Dames & Moore, 1980). Steilacoom Gravel occurs over the project site and surrounding area. It is typically about 12 to 18 meters (about 40 to 60 feet) thick (Earth Consultants, 1989).

The Vashon Till, a mixture of clay, silt, sand, gravel, and boulders, typically underlies the Steilacoom Gravel separating this upper aquifer from a lower aquifer, the Vashon Advance Outwash. There is evidence in the project vicinity (well borings from the Boeing Plant and from Spanaway) indicating that the Vashon Till is not present beneath the project site.

The Vashon Advance Outwash at the project site generally ranges from 8 to 15 meters (25 to 50 feet) in thickness (Brown and Caldwell, et al., 1985). Vashon Advance Outwash was deposited by glacier melt-water streams as the glacier advanced and consists mostly of coarse-grained materials (sands, gravels, cobbles and boulders). High permeability due to the coarse nature of the rock materials is a contributing factor in making Vashon Advance Outwash the primary supply source for domestic wells in the region (Walters and Kimmel, 1968).

B.2.2 Geologic Hazards

The primary geologic hazards in the project area are those related to earthquakes. Earthquakes in the Northwest are associated with the movement of tectonic plates, which make up the outermost 100-kilometer (60-mile) layer of the earth. The subduction of the small Juan de Fuca plate (off the Northwest coast) beneath the North American plate is believed to be the primary cause of earthquakes in western Washington and Oregon. Most of the largest earthquakes in the Puget Sound region have occurred between Olympia and the Canadian border. The largest recorded earthquakes for this area have occurred in Olympia in 1949 (7.1 magnitude on the Richter scale) and between Tacoma and Seattle in 1965 (6.5 magnitude) (Noson, et al., 1988).

Evidence has increased in recent years indicating that western Washington and Oregon are subject to both (1) a greater risk of shallow-crustal earthquakes than had been previously thought and (2) large subduction zone earthquakes, a type which has not occurred in the region for about 300 years. In response to the growing body of evidence, it has been proposed that the seismic hazards and building design criteria for western Washington and Oregon be increased to seismic zone 3 from the current designation as seismic zone 2 (Walsh, 1993).

B.2.3 Soils

Soils in the Puget Sound basin were formed in glacial materials and reflect the underlying geology; the soils are formed under the influence of coniferous forests and grassland (Franklin and Dyrness, 1988). The Soil Conservation Service (SCS) has identified the soils at the site as Spanaway gravelly sandy loam. On the general soil map for Pierce County, the Spanaway Association is characterized by nearly level, somewhat excessively drained soils.

Mixed on the surface with volcanic ash, Spanaway soil exhibits moderately rapid permeability and slow surface water runoff. Approximately 36 centimeters (about 14 inches) of the uppermost soil profile is typically black, gravelly sandy loam increasing with depth to about 152 centimeters (about 60 inches) below the surface.

The SCS indicates that the engineering properties of Spanaway soil do not present limitations for construction and urban development. Slopes are generally between 0 and 6 percent, and there is little erosion hazard. Surface water readily percolates downward due to the gravelly structure of the soil, making protection of groundwater supplies from above ground

contaminants a concern (SCS, 1979).

Spanaway soil is classified within the coarse-grained soil division of the Unified Soil Classification System (Unified). From around 0 to 46 centimeters (around 0 to 18 inches), Spanaway soil is described as "sands with fines" and "gravels with fines." From about 46 to 152 centimeters (about 18 to 60 inches), the soil is described as "clean gravel" with sand mixed in, and little or no fines (Unified).

Test pits dug at the site indicated that the topsoil is composed of glacial outwash sands and gravels and fine-grained alluvial deposits. Beneath this is a layer of coarse sands and gravels with a variable silt, gravel, and cobble content (Dames & Moore, 1980). In general, the sands and gravels encountered within a few feet of the topsoil layer contain more silt- and clay-sized particles than deposits encountered at depths below approximately 2 meters (6 feet). In almost every test pit, a thin layer of topsoil consisting of dark brown sandy silt with organic material was encountered at the surface and is believed to mantle much of the area (Dames & Moore, 1980). A test pit dug in close proximity to the proposed project site exhibited the following profile:

0 - 8 centimeters	(0 - 3 inches)	Dark brown silty fine sand with roots (topsoil)
8 centimeters - - 0.5 meters	(3 inches 1.5 feet)	Dark brown silty fine to coarse gravel with sand, cobbles, and occasional roots
0.5 - 3 meters	(1.5 - 10 feet)	Gray and brown sandy gravel with cobbles and occasional boulders. (Dames & Moore, 1980)

B.3 GROUNDWATER AND SURFACE WATER

B.3.1 Groundwater

The proposed project site lies within the southern region of Pierce County, in an area bordered on the south and east by the Nisqually, Ohop, and Puyallup Valleys. Glacial recessions from the Pleistocene epoch have left behind unconsolidated deposits composed of boulders, cobbles, gravel, sand, and clay. In general, the deposits are porous and easily transmit water to depths of over 600 meters (2,000 feet) (Brown and Caldwell, 1985).

B.3.2 Surface Water

There are no surface water streams located on the proposed project site due to the highly permeable nature of the soils. Clover Creek originates northeast of the project site from a groundwater spring and flows westward down the basin, approximately 1,220 meters (4,000 feet) north of the project site. A pond located approximately 365 meters (1,200 feet) south of the site is the only other surface water feature. There is no evidence of any existing wells or storm water catch basins on the project site (ENSR, 1993).

APPENDIX C AGENCY RESPONSE LETTERS

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Ecological Services
3704 Griffin Lane SE, Suite 102
Olympia, Washington 98501-2192
(206) 753-9440 FAX: (206) 753-9008

March 5, 1993

Daniel Raider, Senior Staff Scientist
Woodward-Clyde Consultants
111 S.W. Columbia, Suite 990
Portland, Oregon 97201

FWS Reference: 1-3-93-SP-327

Dear Mr. Raider:

This is in response to your letter dated February 3, 1993, and received in this office on February , 1993. Enclosed is a list of candidate species that may be present within the area of the proposed Tenaska Cogeneration project to construct and operate an electrical generation plan ant with a 248-megawatt capacity located 12 miles southeast of Tacoma, in Pierce County, Washington. The list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under Section 7(c) of the Endangered Species Act of 1973, as amended (Act). We have also enclosed a copy of the requirements for the Bonneville Power Administration (BPA) compliance under the Act.

To the best of our present knowledge, there are no listed species within the area of the subject project. However, candidate species may occur in the vicinity of the project.

Candidate species are included simply as advance notice to federal agencies of species which may be proposed and listed in the future. However, protection provided to candidate species, now may preclude possible listing in the future. If early evaluation of your project indicates that it is likely to adversely impact a candidate species, the BPA may wish to request technical assistance from this office.

In addition, please be advised that federal and state regulations may require permits in areas where wetlands are identified. You should contact the Seattle District of the U.S. Army Corps of Engineers for federal permit requirements and the Washington State Department of Ecology for state permit requirements.

Your interest in- endangered species is appreciated. If you have additional questions regarding your responsibilities under the Act, please contact Jim Michaels or Jennifer King of my staff at the letterhe,ad phone address.

Sincerely,

David C. Frederick
Field Supervisor

jlk/kr
SE/BPA/1-3-93-SP-327/Pierce
Enclosures
c: WDW, Olympia (Nongame)
WNHP, Olympia

LISTED AND PROPOSED ENDANGERED AND THReaTENED SPECIES AND CANDIDATE SPECIES WHICH MAY OCCUR WITHIN THE VICINITY OF THE PROPOSED TENASKA COGENERATION PROJECT IN PIERCE COUNTY, WASHINGTON (T19N, R3E, S36) 1-3-93-SP-327

LISTED

None

PROPOSED

None

CANDIDATE quail (Oreortyx pictus) - may occur in the vicinity of the project.

Northern red-legged frog (Rana aurora aurora) - may occur in the vicinity of the project.
Spotted frog (Rana pretiosa) - may occur in the vicinity of the project.
Tacoma western pocket gopher (Thomomys zazama tacomensis) - may occur in the vicinity of the project.

Attachment A

ATTACHMENT B
FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7(a) AND 7(c) OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED

SECTION 7(a) - Consultation/Conference
Requires:
1. Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;
2. Consultation with FWS when a federal action may affect a listed endangered or threatened species to ensure that any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the federal agency after it has determined if its action may affect (adversely or beneficially) a listed species; and

3. Conference with FWS when a federal action is likely to jeopardize the continued existence of a proposed species or. result in destruction or an adverse modification of proposed critical habitat.

SECTION 7(c) - Biological Assessment for Construction Projects *
Requires federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to identify any proposed and/or listed species which is/are likely to be affected by a construction project. The process is Initiated by a federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the species list, please verify the accuracy of the list with our Service. No irreversible commitment of resources is to be made during the BA process which would result in violation of the requirements under Section 7(a) of the Act. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should: (1) conduct an onsite inspection of the area to be affected by the proposal, which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or potential reintroduction of the species; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within the FWS, National `Marine Fisheries Service, state conservation department, universities, and others who may have data not yet published tin scientific literature; (4) review and analyze the' effects of the proposal on the species in terms `of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measu're; and (6) prepare a report documenting the results, including a discussion of study methods used, any problems

encountered, and other relevant information. Upon completion, the report should be forwarded to our Endangered Species Division, 3704 Griffin Lane SE, Suite 102, Olympia, WA 98501-2192.
* "Construction project" means any major federal action which significantly affects' the quality of the human environment (requiring an eis), designed primarily to result in the building or erection of human-made structures such as dams, buildings, roads, pipelines, channels, and the like. This includes federal action such as permits, grants, licenses, or other forms of federal authorization or approval which may result in construction.

Figure (Page C-5 U.S. Department of Energy)

WASHINGTON STATE DEPARTMENT OF
Natural Resources

Jennifer M. Belcher
Commissioner of Public Lands
PO Box 47000
Olympia WA 98504-7000

February 10, 1993

Daniel Raider
Woodward-Clyde Consultants
111 iSW Columbia - Suite 99O
Portland OR 97201

SUBJECT: Proposed Tenaska Cogeneration Project - Pierce Co.
(T19N R03E S36)

We've searched the Natural Heritage Information System for information on rare plants, high quality native wetlands and high qualanity native plant communities within a radius of two miles of your study area.

We have a record of a state sensitive plant, Aster curtus (white-top aster), occurring in the vicinity of your project. The population of white-top aster is reported to occur in Section 12, Township 18 North, Range 03 East. I have enclosed a fact sheet on Aster curtus for your information.

The Natural Heritage Information System is a cooperative effort between the Department of Natural Resources' Washington Naturalan Heritage Program and the Department of Wildlife's Nongame Program. The Washington Natural Heritage Program is responsible for information on the state's endangered, threatened, and sensitive planants as well as high qualanity native planant communities and wetlands. The Nongame Program mianages and interprets data on wildlife species of concern in the state. For information on animals of concern in the state, please contact the Nongame Program, Washington Department of Wildlanife, 600 Capitol Way North, Olympia, WA 98501-1091.

The Natural Heritage Information System is not a complete inventory of Washington's natural features. Many areas of the state have never been thoroughly surveyed. There may bei significant natural features in your study area that we don't yet know about. This response should not be regarded as a final statement on the natural features of the areas being considered and doesn't eliminate the need or responsibility for detailed on-site surveys.

I hope you'll find this information helpful.

Sincerely,

Sandy Noirwood, Environmental Review Coordinator
Washington Natural Heritage Program
Division of Land & Water Conservation
PO Box 47047
Olympia, WA 98504-7047
(206) 902-1667

enclosure

Eoual Opportunity/Affirmative Action Employer

Figure (Page C-7 NAME: Aster curtus Crong...)

APPENDIX D REVIEW OF BIOLOGICAL AND EPIDEMIOLOGICAL STUDIES RELATING TO EMF

Much attention at present is focused on several recent reports suggesting that workers in certain electrical occupations and people living close to power lines have a small increased risk of leukemia and other cancers (Sagan, 1992). The evidence, however, does not conclusively prove that a cause-and-effect relationship between electric or magnetic fields and cancer exists.

A study in Denver, Colorado, (Wertheimer and Leeper, 1979) and one in Sweden (Tomenius, 1986) first reported that some cancer risks were about 2-3 times greater for children living near certain types of power lines assumed to be carrying high current. Those researchers suggested that the finding may be related to the magnetic fields of 2-3 mG produced in homes by such lines. The possibility could not be ruled out, however, that other factors, or chance, may be involved. If certain power lines actually do influence cancer rates, this would mean that two or three children out of 10,000 children exposed to such lines would develop cancer each year, compared to the normal rate of 1 in 10,000 per year (Ahlbom et al., 1987).

Another study from Denver (Savitz et al., 1988) indicated results that were generally consistent with the earlier work on childhood cancer by Wertheimer and Leeper (1979). However, the relative risk in the new study (1.5) was smaller than that reported earlier (2-3). it was also on the borderline of statistical significance. Results of another study, from the Seattle area, found no association between power lines and leukemia in adults (Severson et al., 1988). An earlier power line study in Denver by Wertheimer and Leeper (1982) also found no increase in adult leukemia. However, the earlier Denver study did find an increased risk for some other types of adult cancers.

A study done in Los Angeles County, California, provided additional support for an association between childhood leukemia risk and high current power lines (Long et al., 1991). The odds ratio for very high current lines compared to very low current and underground was 2.15. Associations with actual measured electric and magnetic fields, however, were weaker and not statistically significant.

A new study done in Sweden found that the relative risk for leukemia in children living near transmission lines was 3.8 where magnetic fields were greater than 3 mG (Feychting and Ahlbom, 1992). Preliminary information on a larger study done in Denmark indicates no increased risk of leukemia for children living near transmission lines in that country (Olsen, 1992). However, there was an elevated risk of lymphoma reported in the Danish study.

Studies in Rhode Island (Fulton et al., 1980), in Taiwan (Lin and Lu, 1989) and in England (Myers et al., 1985) found no significant association between childhood cancer and power lines. Other community studies in England found no consistent evidence to support a power line-cancer association (Coleman et al., 1985; McDowall, 1986).

A study in Washington State first reported that men in various "electrical occupations" had died more frequently from leukemia than men in other occupations (Milham, 1982). Other studies reported similar findings, suggesting an increased risk of around 20 to 50 percent (Savitz and Calle, 1987; Coleman and Beral, 1988). However, the studies were primarily based on information only from death certificates (i.e., job title and cause of death). It, therefore, was not possible to determine

whether the preliminary findings were related to electric and magnetic fields, or to other exposures such as those from chemicals.

Research on electric and magnetic fields and cancer was reviewed in a draft report by the U.S. Environmental Protection Agency (EPA, 1990). The EPA concluded that magnetic fields are a possible but unproven cause of cancer in humans and more research is needed. The EPA's Science Advisory Board (SAB) also reviewed the issue and reached a similar conclusion. The SAB, however, recommended that the EPA report should be rewritten to correct inconsistencies in the report (SAB, 1991).

In addition to research on humans and laboratory animals, several studies have investigated possible effects of transmission line electric and magnetic fields on plants, wildlife, and domestic animals (BPA; Lee, et al., 1989). Crop growth is not noticeably affected by even the largest transmission lines. Trees that are allowed to grow too close to transmission line conductors can be damaged by the strong electric fields near the conductors. Normally, trees are not allowed close to conductors to prevent electrical flashover, i.e., spontaneous arcing of electrical current from lines to trees.

Studies have shown that honey bees in commercial hives can be adversely affected by strong transmission line electric fields. Shocks received by bees while in the hive cause decreased honey production and increased mortality. As a precaution, BPA recommends that bee hives not be placed directly on the transmission line right-of-way.

Wildlife do respond to effects (e.g., changes in food supply), of cleared rights-of-way. However, there is no evidence that their behavior is noticeably affected by the presence of electric and magnetic fields. Few studies have attempted to determine whether wildlife may be affected by long-term exposure to these fields. As noted above, some effects of electric and magnetic fields have been found in laboratory animal studies. It is not known whether such effects occur in wildlife similarly exposed to these fields.

Several studies have looked at the behavior and production of livestock raised near transmission lines. These studies found no indication that electric or magnetic fields have any major effects on livestock. Most of the studies were not designed to detect any subtle field effects, however, more detailed information on the potential health effects of electric and magnetic fields can be found in a free BPA publication (incorporated here by reference): "Electrical and Biological Effects of Transmission Lines: A Review (1989)." (Copies may be ordered by calling BPA's document request line at (800) 622-5420.)

    

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APPENDIX E BIOLOGICAL RESOURCE SURVEY METHODS, LIMITATIONS AND DESCRIPTIONS OF STATE- AND FEDERAL-DESIGNATED CANDIDATE SPECIES

E.1 SURVEY METHODS

The focus of the survey was threefold: (1) to describe in

general terms the vegetation and wildlife habitats, (2) to identify sensitive and protected species of plants and animals, including Federal- and state-listed rare, threatened, and endangered species, candidate and proposed species and species of special concern that occur or may occur, and (3) identify any wetlands on site.

Literature Review

Prior to the field survey, existing information was obtained and U.S. Fish and Wildlife Service (USFWS) and Washington Department of Wildlife (WDW) and Washington Department of Natural Resources (DNR) personnel were consulted for pertinent background information. Literature reviewed included the WDW's Species of Concern List (WDW 1991a), the WDW Management Recommendations for Washington's Priority Habitats and Species (WDW 1991b) and the Washington State Department of Natural Resources' (DNR) Endangered, Threatened and Sensitive Vascular Plants of Washington (DNR 1990). Requests for information regarding any sensitive species which may be present in project vicinity or at the project site were sent to DNR (dated 15 January 1993) and USFWS (dated 3 February 1993). In addition, the WDW Priority Habitat and Species (PHS) data base was consulted for information on any sightings of sensitive species at the site or in the vicinity. Other information consulted included a U.S. Geological Survey (USGS) 7.5-minute topographic map (Frederickson quadrangle), a National Wetland Inventory (NWI) map, and an aerial photo of the site.

Three reports were reviewed as resource materials in the preparation of this report. The first was the Topical Outline: Frederickson Generation Project, prepared for BPA (Science Applications International, 1992). The second was the Frederickson Power Production Facility Siting Study (WCC 1992) and the third was the Tenaska Siting Report (WCC 1992).

The topical outline provided a preliminary evaluation of environmental issues that would be addressed in the eis and a site description. However, this report describes conditions for a nearby site located nearby the currently proposed site. The study and siting report detail plant and wildlife species observed at the currently proposed site during a field survey. These reports were used to supplement information gathered during the latest field survey (February 2, 1993), as described in Section 4.5.1. Discussions with personnel at WDW (Lea Knutsen, personal communication, February 1, 1993) and at USFWS (Michelle Eames, personal communication, March 23, 1993) did not provide information regarding sensitive species/habitats beyond that indicated in these agencies' response letters.

Field Survey
A field survey of the present site was performed on February 2, 1993. This survey included walking the perimeter of the site and a meandering ground transect survey of the interior. Plant species and communities, and wildlife and sensitive species observed were described and noted on the aerial photo. Tree height estimates and diameter-at-breast-height (DBH) measurements were performed. Percent coverage estimates for species over the entire project site were made while in the field. Any unknown plants that could not be readily identified in the field were collected, later identified and verified.

A wetlands survey was performed, concurrent with the vegetation and wildlife survey, according to criteria set forth in the Army Corps of Engineers' (Corps) Federal manual for identifying and delineating jurisdictional wetlands (Federal Interagency Committee for Wetland Delineation).

Limitations
The site was surveyed in early February when an unusually cold spell caused snow and low temperatures throughout the Pacific Northwest. This time of year severely limited the number of identifiable herbaceous plants, compared to those identifiable later in the growing season (late March through October). In addition, many wildlife species which are detectable during the spring, summer, and fall were either absent or inactive. As a consequence the list of plant and animal species developed during the survey is limited by the season in which field studies were conducted. However, a survey conducted by Woodward-Clyde in August 1992, near the end of the growing season, has been used to supplement information gathered for the

February survey. Due to a report in the fall of 1993 of a sensitive plant species (white-top aster, Aster curtus) in close proximity to the project site, an intensive field survey for this Federal Candidate species was conducted (Salix Associates, 1993). At the time of the survey (early November), the flowering stems of white-top aster were in seed and easily recognizable due to distinct characteristics.

It is probable that white-top aster was not abundant at the time of the August 1992 survey due to prolonged drought conditions. The 1993 season was a particularly strong one for most wildflowers in response to sufficient rainfall.

E.2 DESCRIPTION OF STATE- AND FEDERAL-DESIGNATED CANDIDATE SPECIES

Descriptions of State- and Federal-designated Candidate Species identified during report preparation are provided below.

Western bluebird: The closest record of this Federal-designated sensitive and state-designated candidate species is approximately 3 km (2 miles) west/northwest of the project site. This species requires nesting cavities in large trees or nest boxes for breeding habitat. Like other bluebirds, this species migrates by day, and is found in small flocks when out of the nesting season (Robbins et al., 1983). Potential breeding habitat for this species could exist at the site if any of the trees there contain suitable nesting cavities. In addition, open upland weedy fields surrounding the forested areas at the site could provide suitable foraging habitat. Western bluebirds were not observed during the field visit or for the field survey performed for the Tenaska Siting Report (Woodward-Clyde 1992) and no nesting cavities were observed. It is probable that the field survey for the Siting Report was too early in the summer to detect breeding activity. The winter field visit occurred at a time when bluebirds were not present (they winter farther south). The likelihood of this species inhabiting the project site is moderate to low as the forested area on site is relatively isolated and small.

Western gray squirrel: The closest record of this state-designated candidate species is approximately 5.5 km (3.5 miles) southwest of the project site. This species' habitat extends through western Oregon into central and western Washington. Primarily found in oak groves, this species mostly feeds on acorns, which they gather and bury in preparation as a winter food source. This species uses abandoned woodpecker or flicker holes for a brood den (Ingles 1965). Douglas-fir and oak stands at the project site could provide a source of food for the western gray squirrel. The trees, however, are in a relatively isolated and small clump, which is less suitable than a larger, more extended patch of habitat. No western gray squirrels were observed either for this field survey or that of the Tenaska Siting Report (Woodward-Clyde 1992). At best, it is likely that this species would make only occasional use of this site.

Great blue heron: The closest sighting of this state-monitored species to the project site is 9.5 km (6 miles) southwest. This species is common in fresh as well as saltwater environments (Robbins et al., 1983). In addition, this species also requires large trees for breeding and nesting habitat. Neither water sources nor large trees occur at the project site. No great blue herons were observed during field surveys and it is highly unlikely that this species occurs there.

Purple martin: The closest record of this Federal-designated sensitive and state-designated candidate species is 7 km (4.5 miles) southwest of the project site. This species is locally common where there are multi-celled nesting boxes, cavities or gourds (Robbins et al., 1983). This condition does not exist at the project site. Martins were not observed during field surveys and they are unlikely to occur there.

Bald eagle: The closest record of this Federal-designated and state-designated threatened species is 6.5 km (4 miles) east of the project site. Bald eagles forage almost exclusively on fish, waterfowl and other water-associated birds. All of these potential food sources require aquatic habitats, none of which occur at the site. In addition bald eagles, require large trees for nesting. No trees of a size or configuration suitable as

nesting trees for this species are present at the site. No bald eagles were observed during field survey and no recorded nests are located at the site. It is highly unlikely this site, which consists primarily of weedy upland fields and a small patch of Douglas-fir and Oregon white oak trees, would provide any foraging habitat value for bald eagles.

Fisher: The closest record of this Federal-designated candidate 2 and state-designated candidate species is approximately 10.5 km (6.5 miles) east of the project site. This species is found across Oregon and Washington forests. The observation of this species was made in a largely forested area, unlike the more developed habitat found at the project site or within the vicinity (Woodward-Clyde Consultants, 1992). Fishers avoid open areas lacking forest canopy (Douglas and Strickland 1987). No observations of this species were made during field surveys and it is highly unlikely that they occur due to lack of suitable habitat.

White-top aster: This Federal-designated candidate and state-designated sensitive species is found in native prairies of the Puget Trough and the Willamette Valley (WNHP 1981). White-top aster is associated with Idaho fescue (Festuca idahoensis). Suitable white-top aster habitat is threatened by expanding agricultural practices, grazing and urban development. White-top aster and Idaho fescue have both been observed at the project site. A map showing the locations of the white-top aster populations is found in Figure 5.5-1 of the text.

Mountain Quail: This Federal-designated candidate species is common in mountain regions in mixed woodlands and chaparral. Although the project site is not located in a mountainous region and true chaparral habitat is not present at the site, chaparral-like conditions are present in the upland weedy fields; a low, closed canopy composed primarily of non-deciduous shrubs. No mountain quail were observed during field surveys. There is a moderate to low likelihood of this species utilizing the site.

Northern red-legged frog and spotted frog: Both of these Federal-designated candidate species require a seasonal or perennial water source for suitable habitat. No water sources occur at the site and it is highly unlikely that either of these species are present there.

Tacoma western pocket gopher: This Federal-designated candidate species is found along the lower Umpqua River in western Oregon and from prairies to alpine meadows west of the Cascade Mountains in Washington, Oregon and northern California. As it digs for food, this species burrows in an area up to 185 square meters (2000 square feet) (Ingles 1965). The western pocket gopher does not hibernate or become inactive at any time of the year and may burrow through snow, feeding on stems of grass and other plants at ground surface. Evidence of burrowing systems were observed at the project site, although it was not determined whether this was from pocket gophers or moles (Scapanus sp.).

TABLE E-1 PLANTS OBSERVED AT THE TENASKA SITE ON AUGUST 13, 1992, FEBRUARY 2, 1993, AND NOVEMBER 1993

Common Name	Scientific Name
Trees	
Douglas-fir	Pseudotsuga menziesii
Oregon white oak	Quercus garryana
Shrubs	
Cascara	Rhamnus purshiana
Douglas-fir	Pseudotsuga menziesii (young)
Elderberry	Sambucus spp.
Indian plum	Oemleria cerasiformis
Low Oregon grape	Mahonia (Berberis) nervosa
Mock orange	Philadelphus lewisii
Mountain ash	Sorbus sp.
Oregon white oak	Quercus garryana (young)
Ponderosa pine	Pinus ponderosa
Scotch broom	Cytisus scoparius
Serviceberry	Amelanchier alnifolia
Snowberry	Symphoricarpos albus
Tall Oregon grape	Mahonia (Berberis) aquifolium

Herbs	
Bearberry	Arctostaphylos uva-ursi
Blue wildrye	Elymus glaucus
Blueleaf strawberry	Fragaria virginiana
Bracken fern	Pteridium aquilinum
Bull thistle	Cirsium vulgare
Camas sp.	Camassia sp
Colonial bentgrass	Agrostis tenuis
Common St.John's Wort	Hypericum perforatum
Herbs (continued)	
Common velvetgrass	Holcus lanatus
Early blue violet	Viola adunca
English plantain	Plantago lanceolata
Goatsbeard sp.	Tragopogon sp.
Goldenrod sp.	Solidago sp.
Harebell sp.	Campanula sp.
Hawthorne sp. (introduced)	Crataegus sp. (monogyna?)
Idaho fescue	Festuca idahoensis
Kentucky bluegrass	Poa pratensis
Marguerite	Chrysanthemum leucanthemum
Nightshade sp.	Solanum sp.
Orchardgrass	Dactylis glomerata
Red clover	Trifolium pratense
Red fescue	Festuca rubra
Self-heal	Prunella vulgaris
Sheep sorrel	Rumex acetosella
Silver hairgrass	Aira caryophyllea
Spotted cat's ear	Hypochaeris radicata
Stinging nettle	Urtica dioicia
Tall fescue	Festuca arundinacea
Tansy ragwort	Senecio jacobea
Trailing blackberry	Rubus ursinus
White-top aster	Aster curtus
Wooly sunflower	Eriophyllum lanatum

Source: Woodward-Clyde Consultants, 1992 and 1993, and Salix Associates, 1993.

TABLE E-2 WILDLIFE (OR RECOGNIZABLE SIGNS) OBSERVED AT THE TENASKA SITE ON AUGUST 13, 1992 AND FEBRUARY 2, 1993

Common Name	Scientific Name
Mole	Scapanus (sp.)
Pocket gopher	Thomomys (sp.)
American robin	Turdus migratoris
Barn swallow	Hirundo rustica
Dark-eyed junco	Junco hyemalis
House finch	Carpodacus mexicanus
Mourning dove	Zenaida macroura
European starling	Sturnus vulgaris
Band-tailed pigeon	Columba fasciata
Great horned owl	Bubo virginianus

Figure (Figure E-1 National Wetland ...)

APPENDIX E BIOLOGICAL RESOURCE SURVEY METHODS, LIMITATIONS AND DESCRIPTIONS OF STATE- AND FEDERAL-DESIGNATED CANDIDATE SPECIES

E.1 SURVEY METHODS

The focus of the survey was threefold: (1) to describe in general terms the vegetation and wildlife habitats, (2) to identify sensitive and protected species of plants and animals, including Federal- and state-listed rare, threatened, and endangered species, candidate and proposed species and species of special concern that occur or may occur, and (3) identify any wetlands on site.

Literature Review

Prior to the field survey, existing information was obtained and U.S. Fish and Wildlife Service (USFWS) and Washington Department of Wildlife (WDW) and Washington Department of Natural Resources (DNR) personnel were consulted for pertinent background information. Literature reviewed included the WDW's Species of Concern List (WDW 1991a), the WDW Management Recommendations for Washington's Priority Habitats and Species (WDW 1991b) and the Washington State Department of Natural Resources' (DNR) Endangered, Threatened and Sensitive Vascular Plants of Washington (DNR 1990). Requests for information regarding any sensitive species which may be present in project vicinity or at the project site were sent to DNR (dated 15 January 1993) and USFWS (dated 3 February 1993). In addition, the WDW Priority Habitat and Species (PHS) data base was consulted for information on any sightings of sensitive species at the site or in the vicinity. Other information consulted included a U.S. Geological Survey (USGS) 7.5-minute topographic map (Frederickson quadrangle), a National Wetland Inventory (NWI) map, and an aerial photo of the site.

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The topical outline provided a preliminary evaluation of environmental issues that would be addressed in the eis and a site description. However, this report describes conditions for a nearby site located nearby the currently proposed site. The study and siting report detail plant and wildlife species observed at the currently proposed site during a field survey. These reports were used to supplement information gathered during the latest field survey (February 2, 1993), as described in Section 4.5.1. Discussions with personnel at WDW (Lea Knutsen, personal communication, February 1, 1993) and at USFWS (Michelle Eames, personal communication, March 23, 1993) did not provide information regarding sensitive species/habitats beyond that indicated in these agencies' response letters.

Field Survey
A field survey of the present site was performed on February 2, 1993. This survey included walking the perimeter of the site and a meandering ground transect survey of the interior. Plant species and communities, and wildlife and sensitive species observed were described and noted on the aerial photo. Tree height estimates and diameter-at-breast-height (DBH) measurements were performed. Percent coverage estimates for species over the entire project site were made while in the field. Any unknown plants that could not be readily identified in the field were collected, later identified and verified.

A wetlands survey was performed, concurrent with the vegetation and wildlife survey, according to criteria set forth in the Army Corps of Engineers' (Corps) Federal manual for identifying and delineating jurisdictional wetlands (Federal Interagency Committee for Wetland Delineation).

Limitations
The site was surveyed in early February when an unusually cold spell caused snow and low temperatures throughout the Pacific Northwest. This time of year severely limited the number of identifiable herbaceous plants, compared to those identifiable later in the growing season (late March through October). In addition, many wildlife species which are detectable during the spring, summer, and fall were either absent or inactive. As a consequence the list of plant and animal species developed during the survey is limited by the season in which field studies were conducted. However, a survey conducted by Woodward-Clyde in August 1992, near the end of the growing season, has been used to supplement information gathered for the February survey. Due to a report in the fall of 1993 of a sensitive plant species (white-top aster, Aster curtus) in close proximity to the project site, an intensive field survey for this Federal Candidate species was conducted (Salix Associates, 1993). At the time of the survey (early November), the flowering stems of white-top aster were in seed and easily recognizable due to distinct characteristics.

It is probable that white-top aster was not abundant at the time of the August 1992 survey due to prolonged drought conditions. The 1993 season was a particularly strong one for most wildflowers in response to sufficient rainfall.

E.2 DESCRIPTION OF STATE- AND FEDERAL-DESIGNATED CANDIDATE SPECIES

Descriptions of State- and Federal-designated Candidate Species identified during report preparation are provided below.

Western bluebird: The closest record of this Federal-designated sensitive and state-designated candidate species is approximately 3 km (2 miles) west/northwest of the project site. This species requires nesting cavities in large trees or nest boxes for breeding habitat. Like other bluebirds, this species migrates by day, and is found in small flocks when out of the nesting season (Robbins et al., 1983). Potential breeding habitat for this species could exist at the site if any of the trees there contain suitable nesting cavities. In addition, open upland weedy fields surrounding the forested areas at the site could provide suitable foraging habitat. Western bluebirds were not observed during the field visit or for the field survey performed for the Tenaska Siting Report (Woodward-Clyde 1992) and no nesting cavities were observed. It is probable that the field survey for the Siting Report was too early in the summer to detect breeding activity. The winter field visit occurred at a time when bluebirds were not present (they winter farther south). The likelihood of this species inhabiting the project site is moderate to low as the forested area on site is relatively isolated and small.

Western gray squirrel: The closest record of this state-designated candidate species is approximately 5.5 km (3.5 miles) southwest of the project site. This species' habitat extends through western Oregon into central and western Washington. Primarily found in oak groves, this species mostly feeds on acorns, which they gather and bury in preparation as a winter food source. This species uses abandoned woodpecker or flicker holes for a brood den (Ingles 1965). Douglas-fir and oak stands at the project site could provide a source of food for the western gray squirrel. The trees, however, are in a relatively isolated and small clump, which is less suitable than a larger, more extended patch of habitat. No western gray squirrels were observed either for this field survey or that of the Tenaska Siting Report (Woodward-Clyde 1992). At best, it is likely that this species would make only occasional use of this site.

Great blue heron: The closest sighting of this state-monitored species to the project site is 9.5 km (6 miles) southwest. This species is common in fresh as well as saltwater environments (Robbins et al., 1983). In addition, this species also requires

large trees for breeding and nesting habitat. Neither water sources nor large trees occur at the project site. No great blue herons were observed during field surveys and it is highly unlikely that this species occurs there.

Purple martin: The closest record of this Federal-designated sensitive and state-designated candidate species is 7 km (4.5 miles) southwest of the project site. This species is locally common where there are multi-celled nesting boxes, cavities or gourds (Robbins et al., 1983). This condition does not exist at the project site. Martins were not observed during field surveys and they are unlikely to occur there.

Bald eagle: The closest record of this Federal-designated and state-designated threatened species is 6.5 km (4 miles) east of the project site. Bald eagles forage almost exclusively on fish, waterfowl and other water-associated birds. All of these potential food sources require aquatic habitats, none of which occur at the site. In addition bald eagles, require large trees for nesting. No trees of a size or configuration suitable as nesting trees for this species are present at the site. No bald eagles were observed during field survey and no recorded nests are located at the site. It is highly unlikely this site, which consists primarily of weedy upland fields and a small patch of Douglas-fir and Oregon white oak trees, would provide any foraging habitat value for bald eagles.

Fisher: The closest record of this Federal-designated candidate 2 and state-designated candidate species is approximately 10.5 km (6.5 miles) east of the project site. This species is found across Oregon and Washington forests. The observation of this species was made in a largely forested area, unlike the more developed habitat found at the project site or within the vicinity (Woodward-Clyde Consultants, 1992). Fishers avoid open areas lacking forest canopy (Douglas and Strickland 1987). No observations of this species were made during field surveys and it is highly unlikely that they occur due to lack of suitable habitat.

White-top aster: This Federal-designated candidate and state-designated sensitive species is found in native prairies of the Puget Trough and the Willamette Valley (WNHP 1981). White-top aster is associated with Idaho fescue (Festuca idahoensis). Suitable white-top aster habitat is threatened by expanding agricultural practices, grazing and urban development. White-top aster and Idaho fescue have both been observed at the project site. A map showing the locations of the white-top aster populations is found in Figure 5.5-1 of the text.

Mountain Quail: This Federal-designated candidate species is common in mountain regions in mixed woodlands and chaparral. Although the project site is not located in a mountainous region and true chaparral habitat is not present at the site, chaparral-like conditions are present in the upland weedy fields; a low, closed canopy composed primarily of non-deciduous shrubs. No mountain quail were observed during field surveys. There is a moderate to low likelihood of this species utilizing the site.

Northern red-legged frog and spotted frog: Both of these Federal-designated candidate species require a seasonal or perennial water source for suitable habitat. No water sources occur at the site and it is highly unlikely that either of these species are present there.

Tacoma western pocket gopher: This Federal-designated candidate species is found along the lower Umpqua River in western Oregon and from prairies to alpine meadows west of the Cascade Mountains in Washington, Oregon and northern California. As it digs for food, this species burrows in an area up to 185 square meters (2000 square feet) (Ingles 1965). The western pocket gopher does not hibernate or become inactive at any time of the year and may burrow through snow, feeding on stems of grass and other plants at ground surface. Evidence of burrowing systems were observed at the project site, although it was not determined whether this was from pocket gophers or moles (Scapanus sp.).

TABLE E-1 PLANTS OBSERVED AT THE TENASKA SITE ON AUGUST 13, 1992, FEBRUARY 2, 1993, AND NOVEMBER 1993

Common Name	Scientific Name
Trees	
Douglas-fir	Pseudotsuga menziesii
Oregon white oak	Quercus garryana
Shrubs	
Cascara	Rhamnus purshiana
Douglas-fir	Pseudotsuga menziesii (young)
Elderberry	Sambucus spp.
Indian plum	Oemleria cerasiformis
Low Oregon grape	Mahonia (Berberis) nervosa
Mock orange	Philadelphus lewisii
Mountain ash	Sorbus sp.
Oregon white oak	Quercus garryana (young)
Ponderosa pine	Pinus ponderosa
Scotch broom	Cytisus scoparius
Serviceberry	Amelanchier alnifolia
Snowberry	Symphoricarpos albus
Tall Oregon grape	Mahonia (Berberis) aquifolium
Herbs	
Bearberry	Arctostaphylos uva-ursi
Blue wildrye	Elymus glaucus
Blueleaf strawberry	Fragaria virginiana
Bracken fern	Pteridium aquilinum
Bull thistle	Cirsium vulgare
Camas sp.	Camassia sp
Colonial bentgrass	Agrostis tenuis
Common St.John's Wort	Hypericum perforatum
Herbs (continued)	
Common velvetgrass	Holcus lanatus
Early blue violet	Viola adunca
English plantain	Plantago lanceolata
Goatsbeard sp.	Tragopogon sp.
Goldenrod sp.	Solidago sp.
Harebell sp.	Campanula sp.
Hawthorne sp. (introduced)	Crataegus sp. (monogyna?)
Idaho fescue	Festuca idahoensis
Kentucky bluegrass	Poa pratensis
Marguerite	Chrysanthemum leucanthemum
Nightshade sp.	Solanum sp.
Orchardgrass	Dactylis glomerata
Red clover	Trifolium pratense
Red fescue	Festuca rubra
Self-heal	Prunella vulgaris
Sheep sorrel	Rumex acetosella
Silver hairgrass	Aira caryophyllea
Spotted cat's ear	Hypochaeris radicata
Stinging nettle	Urtica dioicia
Tall fescue	Festuca arundinacea
Tansy ragwort	Senecio jacobea
Trailing blackberry	Rubus ursinus
White-top aster	Aster curtus
Wooly sunflower	Eriophyllum lanatum

Source: Woodward-Clyde Consultants, 1992 and 1993, and Salix Associates, 1993.

TABLE E-2 WILDLIFE (OR RECOGNIZABLE SIGNS) OBSERVED AT THE TENASKA SITE ON AUGUST 13, 1992 AND FEBRUARY 2, 1993

Common Name	Scientific Name
Mole	Scapanus (sp.)
Pocket gopher	Thomomys (sp.)
American robin	Turdus migratoris
Barn swallow	Hirundo rustica
Dark-eyed junco	Junco hyemalis
House finch	Carpodacus mexicanus
Mourning dove	Zenaida macroura
European starling	Sturnus vulgaris
Band-tailed pigeon	Columba fasciata
Great horned owl	Bubo virginianus

Figure (Figure E-1 National Wetland ...)

APPENDIX F ARCHAEOLOGICAL RESOURCE SURVEY METHODS

Prior to field surveys a pre-survey investigation was completed. The investigation consisted of three stages, including:

- Review of Pierce County archaeological survey reports and site and historic structure records from the Washington State Office of Archaeology and Historic Preservation (OAHP)
- Examination of General Land Office (GLO) plats and relevant archaeological, ethnohistorical, and historical publications and reports available from the University of Washington
- Review of a U.S. Geological Survey 7.5 minute topographic map (Frederickson quadrangle) to facilitate identification of geomorphic features on the ground

A field survey of the study area was conducted by Historical Research Associates, Inc., in late January and early February of 1993. This survey included walking through the power plant site and its associated pipeline and transmission line corridors using a 20-meter (65-foot) survey transect interval. Transect intervals were oriented along an east-west axis. An additional 60-meter (200-foot) buffer zone surrounding the proposed power plant was surveyed. A 25-meter (80-foot) corridor along both sides of the proposed pipeline and transmission line routes was also surveyed.

The site is characterized by a dense understory of vegetation (see Section 4.5, Vegetation and Wildlife, for a complete description). Consequently, visibility of the ground surface is reduced substantially. Because systematic clearing of vegetation in order to view the entire site surface was not practical, alternative survey techniques were utilized. These techniques included examining areas around the base of fallen trees and other surface exposures where encountered. In order to inspect the ground surface more closely, meter-square (roughly yard-square) plots of vegetation were cleared every 50 to 100 meters (165 to 330 feet) along the transect lines established for the survey.

APPENDIX G AIR QUALITY/PUBLIC HeaLTH AND SAFETY

NOTE TO ReaDER

The air quality information contained in this appendix is excerpted from "Notice to Construct Application, Tenaska Washington II Generation Project, Frederickson, Washington," Tenaska Washington Partners II, L.P., December 1993. Complete air quality information can be found in the application. Also included is an excerpt of Tenaska's December 3, 1993, letter to PSAPCA revising emissions data for particulate matter and impact analyses.

Contents

6.0 AIR QUALITY IMPACT METHODOLOGY

6.1 APPROACH

Air quality . on modeling analyses were Performed to demonstrate that the proposed project will not cause or contribute to the violation of ambient air quality standards for attainment pollutants (N~ s)2, TSP/PM10), and not cause a significant impact for non-attainment pollutants (CO and ozone). Further, although the proposed source is not a major source, the analysis includes an assessment of potential PSD increment consumption (Class I and II increments) from the proposed source. The following is a description of the dispersion models used, meteorological data used, treatment of building wake effects (where applicable), input databases for the models, and available existing background air quality. A Level-2 visibility analysis (USEPA 1988) was Performed using the VIS model to evaluate the visual impact a plume might have at Mt. Rainier National Park (the closest PSD Class I area).

6.11 Description of Air Quality Dispersion Models

Maximum project impacts are expected to occur very near the facility. The air quality modeling analysis to assess the maximum impacts utilized the USEPA's Industrial Source Complex model (ISCST2). Version 92062. The ISC model (USEPA 1992)is recommended as a guideline model for assessing the impact of aerodynamic downwash.. The results from the use of this model were used to estimate maximum impacts for assessing compliance with the ambient standards, PSD Class II increments, and potential maximum toxic impacts near the facility.

The ISC model consists of two programs: a short-term model (ISCST2) and a long-term model (ISCLT2). The ISCST2 program utilizes an hourly meteorological data base, while ISCLT2 is a sector-averaged program using a frequency of occurrence based on categories of wind speed, wind direction, and atmospheric stability. Major features of the ISC model are as follows:

- â Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs 1971 and 1975);

  The influence of building wakes on plume transport and dispersion is evaluated by the Huber and Snyder method (1976. 1977) for physical stack heights that are greater than hb + 0.5Lb, where hb is the building height and Lb is the lesser of the building height or width, and by the Schulman and Scire method (1980a, 1980b, 1985, 1986) for stack heights that are less than hb + 0.5Lb;

- â Terrain truncation algorithm;

- â Regulatory default option;

- â Calm wind treatment of NWS meteorological data,.

- â Buoyancy-induced plume rise algorithm;

- â Procedures suggested by Briggs (1973) for evaluating stack-tip downwash;

- â Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations;

- â Capability of simulating line, volume, and areas sources;

- â Concentration estimates for 1-hour to annual average; and

- â Adjustment procedures for complex terrain.

Version 92062 retained much of the features of the earlier versions, corrected "bugs," as well as extending the direction-specific treatment of building downwash influences from the Schulman-Scire algorithm for shorter stacks to the Huber-Snyder algorithm for stacks up to the GEP stack height. Also, the regulatory default option was selected such that the USEPA

guideline requirements were met. Details of the modeling algorithms employed by ISC may be found in the User's Guide for ISC (USEPA 1987).

To assess potential impacts at Mt. Rainier, the EPA-approved COMPLEX-I model was used COMPLEX-I allows for estimation of ambient concentrations in terrain with elevations higher than stack top. Regulatory default options were selected such that USEPA guideline requirements were met in the use of thips model.

Because Mt. Rainier is located some distance away, and for simplicity, a single point located on the park boundary closest to the project site was evaluated Ambient concentrations are expected to be lower at all other points within the park area Impacts predicted at this point will represent the maximum concentrations expected for the entire park area

6.1.2 GEP Stack Height and Treatment of Building Wake Effects (ISCST only)

The stack height regulation promulgated by USEPA on July 8, 1985 (50 FR 27892) established a stack height limitation to assure that stack height increases and other plume dispersion techniques would not be used in lieu of constant emission controls. This regulation applies to facilities that commenced construction after December 31,1970, and to dispersion techniques implemented after that date. The regulation specifies that Good Engineering Practice (GEP) stack height is the maximum creditable stack height which a source may use in establishing its applicable State Implementation Plan (SIP) emission limitation for stacks uninfluenced by terrain features, the determination of a GEP stack height for a source is based on the following empirical equation:

$$Hg = H + 1.5Lb$$

where: Hg = GEP stack height;

H = Height of the structure on which the source is located, or nearby structure; and

Lb = Lesser dimension (height or width) of the structure on which the source is located, or nearby structure.

Both the height and width of the structure are determined from the frontal area of the structure projected onto a plane perpendicular to the direction of the wind. The area in which a nearby structure can have a significant influence on the source is limited to five times the lesser dimension (height or width) of that structure, or within 0.5 mile (0.8 km) of the proposed stack, whichever is less. The methods for determining GEP stack height for various building configurations have been described in USEPA's technical support document (USEPA 1985a).

The computation of projected building dimensions was performed using the Bowman Environmental Engineering (BEE) GEP preprocessing program. The BEE GEP program builds a mathematical representation of each building to determine projected building dimensions and the potential zone of influence of each building. These calculations were performed for 36 different wind directions.

The input to the BEE GEP preprocessing program consisted of all emission sources and structures along with corresponding building dimensions. Figure 61 illustrates those building structures that would have an influence on the proposed stacks at the Tenaska project site. Input and output for the BEE GEP program are contained in Appendix C.

6.1.3 Source Input Data

The proposed source will consist of a single gas turbine and HRSG (as described in Section 2.0), with a single 100-foot stack. Table 61 presents the source parameters of the stack used in the air quality dispersion analysis. While the actual exit velocity is expected to vary with ambient conditions and load requirements (see Appendix B for details) the value presented in Table 61 represents expected annual average conditions.

6.1.4 Meteorological Data

The meteorological data base used in the dispersion model consisted of 5 years (1980-1984) of surface and coincident upper air observations at the NWS station McChord AFB and Quillayute, Washington, respectively, obtained from the National Climatic Data Center. Surface observations consist of hourly measurements of wind direction, wind speed, and temperature, and estimates of ceiling height and cloud cover. The upper air station provides

a daily morning and afternoon mixing height value as determined from the twice-daily radiosonde measurements. These surface and upper air data were processed into a format suitable for dispersion modeling by USEPA's T program (Turner and Novak 1978). RAMMET utilizes the Turner Classification Scheme (Turner 1970) to estimate the dispersive capacity of the atmosphere. Using the surface observations of wind speed and cloud cover combined with an estimate of insolation based on solar altitude, a stability class category is assigned for each hour of meteorological surface data The twice-daily mixing height values are interpolated by a USEPA scheme (USEPA 1974) to obtain hourly mixing height values. The USEPA developed a rvral and urban interpolation method to account for the effects of the surrounding area on development of the mixing layer boundary.

For the visual impact modeling, the five years processed data were evaluated and a joint frequency distribution (JFD) of wind direction and wind speed was compiled for each stability class (A-F) and each of four periods of the day (hours 1-6,7-12,13-18, and 19-24) pursuant to USEPA guidelines on Plume Visual Impact analysis (USEPA 1988). This JFD is contained in Appendix E.

6.1.5 Receptor Grid

A receptor grid of variable density for the ISC dispersion model was designed to identify the maximum air quality impacts due to the proposed project. The total receptor grid, illustrated in Figure 62, consisted of 991 receptors extending to 5 kilometers from the facility. The coarse receptor grid potioon consisted of 500 m spacing from 1 kmout to 5 km. The refined receptor grid portion consisted of two groups. The first group used a 50-meter spacing from the source stack out to 250 m, excluding locations within the project boundary. The second group utilized a 100 meter spacing out to 1000 m. Figure 6-3 shows facility boundary and the refined grid receptors.

All locations within Mt. Rainier National Park are at elevations above the project stack height. For the COMPLEX-I model run, the location of the closest point on the Mt. Rainier Park boundary to the project was used. This is expected to conservatively represent impacts within the Mt. Rainier Park area.

6.1.6 Background Air Quality Data

There is currently no air quality monitoring being conducted near the project area. To represent background concentrations of NO2, SO2, TSP/PM10, and CO, the Washin.gton Department of Ecology and PSAPCA provided air quality data from around the project area. It is believed that the data collected at these sites are representative of regional background ambient concentrations in the area of the proposed Tenaska facility. These background data are presented in Table 62. These background concentrations were added to the maximum predicted concentrations for comparison to the Washington ambient air quality standards (WAAQS), as appropriate.

6.2 TOXIC IMPACTS

Analysis of toxic impacts from the proposed project include those pollutants as described in Section 3 that are on PSAPCA's list of toxic compounds in Regulation III, Appendix A.

For natural gas firing, toxic compounds are estimated as a fraction of the VOC emissions. Maximum potential toxic impacts are estimated as the applicable fraction of maximum VOC impacts. The predicted impacts are compared to the appropriate acceptable source impact level (ASIL).

For No. 2 fuel oil firing, both toxic VOC species and other trace elements are evaluated. VOC species are, as for gas firing, a fraction of total VOC emissions. Trace metals emissions/impacts are based on fuel consumption. Impacts are pro-rated for annual periods to account for the infrequency of oil firing. Estimated impacts are compared to the appropriate ASILs.

6.3 VISIBILITY

Due to the proximity of the Mt. Rainier Class I area, the potential impacts to visibility were evaluated.

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To assess the impact of the proposed project on visibility, a Level-2 analysis was made using the JFD described in Section 6.1.3 ad following methods described in Workbeok for Plume Visual Impact Screening ad Analysis (EPA 450/4-88-015).

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Table 6-1 SOURCE PARAMETERS AND COORDINATES TENASKA WASHINGTON II GENERATION PLANT GE FRAME 7FA

Stack Height (m)	30.48
Stack Diameter (m)	5.49
Exit Temperature (K)	360.2
Exit Velocity (m/s)	20.14
Stack Coordinates:	
UTM East (km)	548.225
UTM North (km)	5214.706
Base Elevation (ft)	410

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TABLE 6-2 REPRESENTATIVE BACKGROUND AIR QUALITY DATA

Pollutant		Background Concentration (ug/m3)
NO2a		
	Annual	30
SO2b		
	Annual	27
	24-hour	106
	3-hour	. 319
	1-hour	426
PM10c		

	Annual	29
	24-hour	85
TSPd		
	Annual	41
	24-hour	121

Notes:

a Value reported by Dept. of Ecology (1992)
b As measured in Tacoma area (Ecology, 1991)
c Data from PSAPCA (Knectel, 1992) from measurements taken in Puyallup. WA
d Estimated from PM10 data assuming PM10 = 0.70 TSP (Knectel, 1992)

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Figure (app-E Figure 6-1 BUILDING STRUCTURES FOR...)

Figure (app-E Figure 6-2 RECEPTOR GRID USED IN...)

Figure (app-E Figure 6-3 FACILITY PROPERTY BOUNDARY...)

7.0
AIR QUALITY IMPACTS

7.1 SUMMARY

This section presents modeled air quality impacts of emissions and visual impacts from the proposed Tenaska facility project. The results of the ISCST and COMPLEX-I models show that NO2, TSP/PM10, CO, and SO2 impacts near the project site, as well as at Mt. Rainier National Park, will be below EPA and PSAPCA significance levels (see Table 4-1), and further, will not result in a violation of the ambient air quality standards. Results from the Level-2 visual impact analysis indicate that potential impacts to visibility in Mt. Rainier National Park will be below conservative significance criteria for plume perceptibility and contrast.

7.2 COMPLIANCE WITH NONATTAINMENT ARea REQUIREMENTS

The proposed project must demonstrate that expected impacts from nonattainment pollutant emissions will not significantly contribute to violation of the federal and/or state ambient standard for that pollutant; this must be done through the use of very stringent control technology and offsets, if necessary. Both VOC (as a precursor to ozone) and CO are nonattainment pollutants in the project area Determining whether the project has a significant impact on the nonattainment status for VOC and CO was performed pursuant to PSAPCA Regulation I, Article 6, Section 6.08.

This project is being designed to utilize very stringent emission control technology. Table 7-1 shows that expected emissions for both CO and VOC are below the thresholds for which a significant impact is defined. Additionally, the predicted ambient concentration increase for CO is well below the significant impact concentration threshold. Consequently. the proposed project is not expected to have a significant impact on the nonattainment areas for CO or ozone, and will not be subject to the requirements to obtain offsets or further control requirements.

elements were based on fuel consumption, and emission rates were used directly to obtain predicted impacts from modeling results (Chi/Q).

Tables 7-5 and 7-6 show that the predicted maximum air toxic impacts from both natural gas and oil firing are well below the acceptable source impact levels (ASILs). These tables indicate whether the compound is either a carcinogen or a non-carcinogen. The only compound that is expected from both gas and oil firing is benzene, and combining the predicted impacts from each fuel scenario still indicates that impacts are well within acceptable levels.

Consequently, the proposed project is not expected to pose a risk with respect to toxic air contaminants from the turbine/HRSG.

7.5 VISIBILITY IMPACTS

An analysis of impacts from the proposed project on visibility in Mt. Rainier National Park was performed at the request of the Washington Department of Ecology. This analysis followed. guidelines given in the "Workbook for Plume Visual Impact Screening and Analysis" (USEPA 1988) for a Level-2 analysis. The study was performed using both the 50th percentile value for background visual range (BVR) for the Mt. Rainier area currently accepted by Ecology (160 km), and the 90th percentile BVR value recommended for the area by the National Park Service (242 km). The meteorological database utilized for this analysis was described in Section 6.0.

The project site is located approximately 35 km to the northwest of Mt. Rainier. Using an appropriate USGS map, it was determined that wind directions from 279 through 320 degrees, inclusive, would potentially bring the plume into Mt. Rainier. Conservatively, all of the West, West-Northwest, and Northwest sectors (from 258.75 degrees to 331.25 degrees azimuth) were used in the analysis to represent the worst-case wind direction that would bring the plume to Mt. Rainier. Following guidance from the wori:beok cited above, using the three wind direction sectors (W,WNW, and NW), the dispersion condition related to the cumulative frequency of occurrence greater than 1 percent was D stability and a wind speed of 3 m/s. Table 7-7 shows the analysis of worst-case meteorological conditions for plume visual impact calculations that led to the choice of this dispersion condition. This

8.0

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SUPPORTING DATA FOR EMISSION CALCULATIONS

Figure (app-E EMISSION CALCULATIONS FIRING NO.2 FUEL OIL (Page 3))

Figure (app-E EMISSION CALCULATIONS FIRING NO.2 FUEL OIL (Page 4))

Figure (app-E EMISSION CALCULATIONS FIRING NO.2 FUEL OIL (Page 5))

Figure (app-E EMISSION CALCULATIONS FIRING NO.2 FUEL OIL (Page 6))

Figure (app-E EMISSION CALCULATIONS FIRING NO.2 FUEL OIL (Page 7))

ATTACHMENTS TO EMISSION CALCULATIONS

1. Emission Calculation Cross Reference - Natural Gas
2. Natural Gas Composition and Heating Value
3. General Electric Performance Data
4. General Electric Letter on VOC and PM-10
5. Mass Balance and Exhaust Gas Compositions - Natural Gas
6. SO2 Calculations for Natural Gas and Fuel Oil
7. Coen Letter on Duct Burner Emissions
8. Mitsubishi Specification for SCR Catalyst
9. Engelhard Letter on CO and VOC Catalyst
10. Emission Calculation Cross Reference - Fuel Oil
11. Fuel Oil characteristics and Heating Value
12 Mass Balance and Exhaust Gas Composition - Fuel Oil

FredFor2c
12/3/92

Table (app-E ATTACHMENT 1...)

Table (app-E ATTACHMENT 2...)

Table (app-E ATTACHMENT 3 (Page 1))

Table (app-E ATTACHMENT 3 (Page 2))

Table (app-E ATTACHMENT 3 (Page 3))

Table (app-E ATTACHMENT 3 (Page 4))

ATTACHMENT 4

November 25, 1992

chuck Eliason
Tenaska Inc.
407 North 117 Street
Omaha, NE 68154

Subject: BPA/Fredrickson Project
7FA combustion Turbine
Performance & Emissions Data

Dear chuck:

In response to your November 19th request, attached are "JAH 7/15/92" performance runs on GE letter head.

Regarding VOC emission data for the specified natural gas fuel and distillate oil #2, twenty percent (20%) of the UHC's represent VOC's when operating on natural gas and fifty percent (50%) on distillate #2. Approximately ten percent (10%) of the total UHC's on natural gas fuel operation are Non-Methane and Non-Ethane. For operation on distillate oil, all of the VOC's are Non-Methane and Non-Ethane (i. e ., 50% of the UHC ' s are Non-Methane and-Non-Ethane). Data providing a further break down of these constituents is not available.

Please note that the foregoing data is based upon GE's definition of VOC (All non-methane organic compounds in the exhaust).

Please contact Peter Pritchard should you have any questions or comments regarding this information.

Best Regards,

Jose R. Dumenigo
Sales Manager

cc: Peter Pritchard (GE)
Mike Lebens (Tenaska)
Phil Black (Tenaska)

Table (app-E ATTACHMENT 5...)

Figure (app-E ATTACHMENT 6...)

Table (app-E ATTACHMENT 7 (Page 1))

Table (app-E ATTACHMENT 7 (Page 2))

ATTACHMENT 7
Sht 3

November 30,1992
Tenaska
Page 3 of 3

I hope that the above information is helpful to you, and if you have any questions, please contact me at your earliest convenience.

Sincerely,

COEN COMPANY, INCORPORATED

Richard A. Broow, Sales Application Engineer
Cogeneration Systems

Figure (app-E ATTACHMENT 8 (Page 1))

Figure (app-E ATTACHMENT 8 (Page 2))

Figure (app-E ATTACHMENT 8 (Page 3))

Figure (app-E ATTACHMENT 8 (Page 4))

ATTACHMENT 9

ENGELHARD CORPORATION
101 WOOD AVENUE
ISELIN, NEW JERSEY 08830-0770
908-205-5000

December 2, 1992

Mr. chuck Eliason
Tenaska
407 North 117 Street
Omaha, NE 68154

Subject: Tenaska Frederickson Washington Proj

Dear Mr. Eliason:

conf irming our conversation, Engelhard- can provide an oxida-
tion catalyst which would simultaneously reduce co and non
methane-non ethane hydrocarbons (NM-NEHC) from the exhaust of
a GE Frame 7FA gas turbine. As discussed; the catalyst would
primarily have to reduce the NM-NEHC emissions when duct

firing is utilized.

We can provide performance guarantees of 8 0% CO reduction and 3 NM-NEHC reduction. The Co reduction is relatively easy to achieve; however, in order to achieve the required NM-NEHC reduction, catalyst location is to be considered. Therefore it is our recommendation to locate the catalyst in a high temperature zone of 1000-1100øF. This will insure 30% NM-NEHC reduction and will not affect the integrity of the catalyst. The catalyst has a ceramic substrate which can withstand temperatures of 1300ø F+.

Thank you for your interest in o,ur company. Please advise us if we can be of further assistance.

Very truly yours,

ENGELHARD CORPORATION
ENVIRONMENTAL CATALYSTS GROUP

Abe Rosenstein
Executive Sales Engineer

ABR/new
92-097

Table (app-E ATTACHMENT 10...)

Table (app-E ATTACHMENT 11...)

Table (app-E ATTACHMENT 12...)

10.0
MSDS FOR DCL 500

Figure (app-E 10.0 MSDS FOR DCL 500 (Page 1))

Figure (app-E 10.0 MSDS FOR DCL 500 (Page 2))

Figure (app-E 10.0 MSDS FOR DCL 500 (Page 3))

Figure (app-E 10.0 MSDS FOR DCL 500 (Page 4))

11.0
DECEMBER 3,1993, LETTER, ETC.

TENASKA WASHINGTON PARTNERS II, L. P.
407 North 117 Street
Omaha, NE 68154

Telephone: (402)691-9500
Fax: (402)691-9526

December 3, 1993
92C0548A

Fred L. Austin, Air Pollution Engineer
Puget Sound Air Pollution Control Agency
110 Union Street, Suite 500
Seattle, Washington 98101-2038

Subject: Request for Modification to DRAFT Notice of Construction Permit/ Order of Approval for Tenaska Washington II Generation Project (Reg. No. 10645, NC No. 4842)

Dear Mr. Austin:

In this letter, Tenaska Washington Partners II, L.P. respectfully request a modification to the DRAFT Order of Approval for Notice of Construction No. 4842. All supporting information and attachments are included with this letter to facilitate your review of this request.

PURPOSE OF REQUEST

This modification request focuses on a revision to the estimated emissions of particulate matter in our proposed project located in Fredrickson, Washington. In the past few months, our engineering staff has realized the need to more accurately estimate particulate matter emissions from the gas turbine/HRSG with the proposed SCR and oxidation catalyst controls. More specifically, we propose to include the formation of particulate matter from secondary sulfate formation due to the presence of ammonia slip from the SCR control system.

This letter presents the revised emission information ad provides revised air quality impact assessment information for TSP ad PM10. From our esitmates, no other pollutants will be emitted in amounts higher than already provided in our original application submittal. Consequently, the analysis provided here is limited to emissions ad air quality impacts associated with particulate matter. It is important to note that the results from this analysis do not indicate a significant increase in impacts compared to those presented in the original analysis.

Fred L. Austin, Air Pollution Engineer
Puget Sound Air Pollution Control Agency
December 3, 1993
Page 2

REVISED PARTICULATE MATTER EMISSIONS

Due to the potential for additional particulate matter emissions from secondary sulfate formation in the turbine exhaust, specifically the reaction of ammonia with SO3 and SO4, estimated emission of TSP and PM10 are revised from estimates provided with our original NC application materials. Table 1 presents the revised estimated particulate matter emissions. Attachment 1 provides the background engineering calculations used to determine these estimates.

REVISED AIR QUALITY IMPACTS

Revised TSP/PM10 Estimated Maximum Impacts. An analysis of air quality impacts for particulate matter was conducted following the same methods as described in our Original NC Application. Maximum short-term and annual impacts were modeled with the EPA-approved 1SC2 dispersion model using the meteorological data set from nearby McChord Air Force Base (1980 - 1984). Due to differing stack parameters, separate simulation were made for annual and short-term impacts. Simulations of short-term impacts were performed using unit emissions and subsequently pro-rated by the revised potential emission rates. Since earlier maximum short-term impacts occurred during oil-firing, it was assumed that the revised short-term impacts would also result from oil-firing, and the simulations incorporated the oil-firing stack parameters accordingly. Simulations for annual impacts were performed using revised potential emission rates (annualized), to account for the combined effect of different stack parameters between gas- and oil-firing.

Table 2 presents the revised impacts from particulate matter as compared to PSAPCA significant impact thresholds. Table 3 presents the revised impacts from particulate matter - as compared to PSD Class increments and ambient standards. The project's estimated maximum particulate matter impacts are well below all, applicable thresholds, increments, and standards.

Revised TSP/PM10 Estimated Impacts at Mt. Rainier. In a method similar to that described above, but using the EPA-approved dispersion model COMPLEX-I as appropriate, a revised impact analysis was conducted for the point of maximum potential impact at the closest Federal Class I wilderness area; Mt. Rainier. Table 4 shows that the revised impacts from particulate matter are well below the PSD Class I increments.

As summary of the revised dispersion modeling results are presented in Attachment 2.

Table (app-E 11.0 DECEMBER 3, 1993, LETTER, ETC. (Table 1))

Table (app-E 11.0 DECEMBER 3, 1993, LETTER, ETC. (Table 2))

Table (app-E 11.0 DECEMBER 3, 1993, LETTER, ETC. (Table 3))

Table (app-E 11.0 DECEMBER 3, 1993, LETTER, ETC. (Table 4))

Fred L. Austin, Air Pollution Engineer
Puget Sound Air Pollution Control Agency
December 3, 1993
Page 7

Air Toxics. There will be no increases in the potential emissions/impacts from the air toxics estimates presented in the original NC Application.

Revised Impacts to Visibility (impacts to Mt. Rainier). As particulate matter is integral

to the analysis of impacts to visibility, the analysis performed in the original NC application was re-assessed. The original analysis estimated impact to visibility at Mt. Rainier using a background visual range (BVR) of 160 kilometers (recommended by PSAPCA), representing a 50th percentile (or average) value of the distance one could see distant objects in the region. Additionally, the original analysis estimated visibility impacts using a BVR of 242 km [90th percentile visual distance], as recommended by the Washington Department of Ecology as a value often used by the National Park Service in evaluating visibility impacts from major sources in the region. The original analysis was performed using a Level-2 analysis as described by the Workbook for Plume Visual Impact Screening and Analysis (EPA 1988) using the EPA-approved VISCREEN model, and default screening plume visual impact thresholds of plume perceptibility and contrast.

In the revised visibility impact analysis, the results from using the same methods as described above for the new PM emissions and BVR value of 1 km demonstrated that impacts will remain below the default screening plume visual impact thresholds. A printout of the VISCREEN simulation is provided in Attachment 3.

For the revised analysis using the BVR value of 242 km, a Level-3 visibility analysis was conducted using the' EPA-approVed PLUVUE II model. This more rigorous analysis estimates impacts accounting for more detailed information about intervening terrain, plume particle characteristics, magnitude of impact, and frequency of occurrence. A complete copy of the Level-3 impact analysis is provided in Attachment 4. The Level-3 analysis results show that plume visual impacts using a BVR value of 242 km would remain below the default screening thresholds.

These revised analyses demonstrate that the project will not cause a significant impact to visibility at Mt. Rainier.

Fred L. Austin, Air Pollution Engineer
Puget Sound Air Pollution Control Agency
December 3, 1.993
Page 8

REQUESTED CHANGES TO DRAFT ORDER OF APPROVAL NC #4842
CONDITIONS

Based on the supporting information presented in this letter (including attachments), Tenaska Washington Partners II, L.P. request that the following changes be made to the indicated specific permit conditions:

Condition #7

Change from: PM10 - 49.0 tons to PM10 = 79.9 tons

Condition #8

	Natural Gas	Oil
Change from:	0.0023 gr/dscf	0.0037 gr/dscf
to:	0.0030 gr/dscf	0.0131 gr/dscf

Based on our review of the DRAFT Order of Approval, the items indicated above are the only things to change. If you feel that additional items in the existing DDAFT Order require changing or new items are required, as a result of the revisions to emissions/impacts described in this letter, please contact us as soon as possible.

Fred L. Austin, Air Pollution Engineer
Puget Sound. Air Pollution Control Agency
December 3, 1993
Page 9

We look forward to your review of this material and further progress on our permit application. Please feel free to contact me at (402) 691-9515 or Mr. Dan Guido (WCC) at (510)874-3172, if you have any questions.

Sincerely,

Michael C. Lebens
Vice President, Engineering

Attachments

cc: Tom Hendricks
Dave Schlotthauer
William E. Steiner (WCC)
Dan Guido (WCC)

ATTACHMENT 1

REVISED EMISSION CALCULATIONS

Figure (app-E ATTACHMENT 1 REVISED EMISSION CALCULATIONS (Page 1))

Figure (app-E ATTACHMENT 1 REVISED EMISSION CALCULATIONS (Page 2))

Figure (app-E ATTACHMENT 1 REVISED EMISSION CALCULATIONS (Page 3))

Figure (app-E ATTACHMENT 1 REVISED EMISSION CALCULATIONS (Page 4))

Figure (app-E ATTACHMENT 1 REVISED EMISSION CALCULATIONS (Page 5))

Figure (app-E ATTACHMENT 1 REVISED EMISSION CALCULATIONS (Page 6))

Figure (app-E ATTACHMENT 1 REVISED EMISSION CALCULATIONS (Page 7))

Figure (app-E ATTACHMENT 1 REVISED EMISSION CALCULATIONS (Page 8))

    

2.0 THE SCOPING PROCESS

The goal of the scoping process is to determine the necessary analyses and issues to be examined in the eis for the BPA administrator to make an informed decision on the environmental consequences of the proposed Project. This is based upon comments and questions raised by the public, government agencies, and the technical and professional judgment of BPA, Pierce County, and their consultants. While the general content of an eis is specified in the National Environmental Policy Act (NEPA), the details are best defined in consultation with the public, public interest groups, and Federal, state and local government agencies. This Scoping Report presents the results of the scoping process.

Part of the first step in the scoping process is to publish in the Federal Register a Notice of Intent (NOI) to prepare an eis for the proposed Project which also announces the time and place for the scoping meeting(s). This notice was published on September 11, 1992. A copy of the NOI is included in Appendix A. Information on the scoping meeting for the Tenaska eis was also mailed out to agencies, indian tribes, and interested groups and individuals. The meeting invitation, the meeting agenda, and a copy of the scoping meeting attendees are contained in Appendix B.

The following newspapers and newsletters contained an announcement of the scoping meeting: the Tacoma News Tribune, the Puyallup Pierce County Herald; the Fort Lewis Ranger; the Northwest Airlifter; the Lakewood Journal; the Gig Harbor Peninsula Gateway. The announcements were published on September 18, 1992.

A scoping meeting was held on Tuesday, September 29, 1992, at Bethel High School in Spanaway, Washington, which is in the vicinity of the proposed Project. The meeting was informal, with presentations by representatives from BPA and Tenaska describing the proposed Project and the environmental review process. There were 41 individuals in attendance at the scoping meeting. Comments and questions that were raised during the presentation were recorded in a verbatim transcript. Four comment letters were also submitted within the public comment period which closed on October 30, 1992. A summary of the comments follows.

2.1 RESULTS OF THE SCOPING PROCESS

This section summarizes the issues raised during the public scoping process, issues to be addressed in the eis, sources of information to be reviewed and/or studies to be conducted, and mitigation measures to be considered. The issues are listed in alphabetical order. Table 4-1 in the December 1992 Scoping Report lists the issues and summarizes information to be reviewed or studies to be conducted that have been identified at this level of investigation. A summary of the individual comments is included in Appendix C in the December 1992 Scoping Report.

2.1.1 Air Quality

Issues Raised during Scoping
Public concern was focused on air quality impacts from the operation of the proposed Project and whether there would be sufficient mitigation measures to offset any significant impacts from the Project. Questions and comments received on air quality included the following:

- Concern over excessive emissions from the proposed Project from burning natural gas or back-up fuel over extended periods.
- Potential contribution of emissions to acid rain deposition and the "greenhouse" effect; requests that these impacts be addressed and environmental costs be evaluated.
- The exploration of power generation sources based on alternative fuel sources other than hydrogen-based compounds.
- Potential for nuisance odors to be emitted from the operation of the generating equipment.
- How does the proposed Project's estimated particulate emissions compare to emissions from wood burning stoves? How many wood stoves would it take to give off the estimated combined particulate emissions from the proposed

Project?

Additional Issues to Be Addressed in the eis
Issues that would be addressed in the eis include the identification and evaluation of air pollutant emission sources expected due to the construction and operation of the proposed facility. Alternative control measures will be explored that would reduce any air pollutant emissions.

Air pollutant emissions during construction activities will be estimated and their impacts assessed. The potential impacts from fugitive dust and air pollutant emissions from the construction of the facility will be evaluated. Work practices designed to minimize such emissions will be suggested. Potential impacts due to the production of steam and fog will be investigated.

Other issues that will be included in the eis involve the storage and handling of acutely hazardous materials at the Project site. While most of the issues relating to these facility systems will be addressed in the Health and Safety section, there is an air quality component to the potential impact of any system failure related to the storage and handling of hazardous materials. Part of the operation of the facility's electricity generation will involve the use of
ammonia as part of the system to control the emissions of oxides of nitrogen (NOX). This raw material will be stored at the facility in a pressurized tank. Also, the water used to create the steam that makes the electricity will be treated with a sulfuric acid solution to maintain the water quality requirements of the process. This material will be stored at the facility in a slightly diluted liquid solution. Potential risk of facility system failure related
to hazardous materials will be addressed.

Several greenhouse gases will be emitted by the proposed Project. These include NOx, carbon dioxide (CO2), methane, and possibly others. There are no current plans to reduce the production of these gases except for that provided by the Selective Catalyst Reduction system to reduce NOx emissions. Additional information will be obtained as to the emission and reduction of greenhouse gases and their effect on global warming trends.

Information to Be Reviewed/Studies Conducted
Information on the following topics will be obtained by review of technical literature and other published documents such as:

- U.S. Environmental Protection Agency (EPA) air pollution emissions factor information for vehicular, proposed Project, and construction equipment. These data will be obtained from EPA publications such as AP-42, Specification Profile manuals, and others.

- Applicable local, state, and Federal regulations giving standards for ambient air quality.

The U.S. EPA's Industrial Source Complex (ISC), Mobile 4 or other appropriate mobile source emission characterization models, and COMPLEX-1 air quality simulation models may be used, if necessary, to analyze ambient air quality impacts. Additionally, if required, the National Safety Council model CAMEO ALOHA will be used to assess off-site impacts from potential accidental releases of acutely hazardous materials. Emission factor literature will be utilized to determine the significance of emission modeling and to assure that all regulations will be met.

Tenaska is involved in an air quality analysis for obtaining an air quality permit. This work includes emission estimates, summarization of air quality regulations, and assessment of air quality and visibility impacts. The results of these studies will be included in the eis.

Mitigation
Possible mitigation measures referred to during the scoping process include:

- Use of appropriate emission control technology to minimize potential direct emissions from the combustion process.

- Use of an alternative fuel source to generate electricity.

- Evaluation of re-forestation programs to offset potential increases in greenhouse gases from the proposed Project.

Other mitigation measures may be identified during the impact analysis and when the Project details are finalized. These measures include:

- Work practices to minimize dust, smoke, and vehicular emissions during the construction phase.

- Development and implementation of regional programs for ride sharing to reduce vehicular emissions that may "offset" impacts.

- Contribution to enhance or augment the regional program which restricts the use of wood stoves during stagnant air episodes.

Possible mitigation measures would be identified for any potentially significant impacts from storage/handling of hazardous materials.

2.1.2 Archaeological, Historic, and Cultural Resources

Issues Raised during Scoping
There were no comments received addressing archaeology and cultural resources.

Additional Issues to Be Addressed in the eis
Review of archaeological, historic, and cultural resources would follow the Section 106 Review Guidelines (36 C.F.R. Part 800) which implement part of the National Historic Preservation Act (NHPA) of 1966. Section 106 requires that historic properties be considered by Federal agencies in both project planning and execution. Properties that have not yet been discovered (such as archaeological properties), but that are potentially eligible for the National
Register of Historic Places (NRHP), are subject to Section 106 Review. Issues to be addressed in the eis include the determination of potential impacts to historic resources by the project including ancillary facilities such as the transmission line right-of-way, right-of-ways for any pipeline connections, and access road right-of-ways. A cultural resources survey would be performed prior to preparing the Deis; if nothing is found, investigation of cultural resources issues will be discontinued.

Information to Be Reviewed/Studies Conducted
Prior environmental review indicates that there are no known historic or archaeologic sites of concern within the area of potential affect; however, no site-specific study has been performed. Reports on file at the State Office of Archaeology and Historic Preservation for the nearby area were identified. These reports are: 1) A Cultural Resources Survey of the BPA's Proposed Tyee Substation, Pierce County, Washington; 2) A Cultural Resource Survey of SR 7: 224th Street East to Junction 507, Pierce County, Washington; 3) Historical Resources Study, BPA Elmhurst Project, Spanaway, Washington; 4) Cultural Resource Assessment and Management Recommendations for McChord Air Force Base, Pierce County, Washington; 5) Archaeological and Historical Investigation Prepared for Chambers Creek U.L.I.D. 73-1; and 6) Interim Cultural Resource Assessment, Chamber Creek Sewerage System, Pierce County.

Mitigation
If a cultural resource is identified during the survey, a wide range of mitigation measures is available. The first option is to reroute or redesign in order to avoid the resource. If the site
cannot be avoided, the next step under the Section 106 process would be to determine the significance of the site. If the site is significant, mitigation possibilities include surface collection, archaeological excavation, or other data recovery measures. These cannot be identified until the survey and significance evaluation are complete.

2.1.3 eis Process

Issues Raised during Scoping
The following questions and comments were raised during scoping regarding the eis process:

- Do the regulatory agencies issue the permits for operation of the proposed facility, and do they assure the public of compliance?
- Will Woodward-Clyde's eis be the only eis prepared? Who would be more likely to prepare an eis that better represents the views of the public?
- Shouldn't Tenaska be preparing the eis with Pierce County as the lead agency? Why is it BPA? Where is the citizen representation if BPA prepares the eis?
- Who is BPA and what Federal role does it play?
- Will commenters receive personal written responses to comments/questions sent in as part of the scoping process?
- Will the comments from the scoping meeting be part of the eis?

These issues will be addressed in a BPA Fact Sheet to the public in January 1993, and within the eis by explaining the NEPA/SEPA process and the role that Tenaska, BPA, Pierce County, other regulatory agencies, and the public have in that process.

2.1.4 Geology

Issues Raised during Scoping
No specific comments were raised concerning geology during the scoping process.

Additional Issues to Be Addressed in the eis
Issues that will be addressed include investigation of soils and slope stability, as well as paleontological resources. The ability of the site to support a stable foundation for roads and buildings will be investigated. Soil borings will be performed throughout the site. Soil types will be identified, physical parameters tested, and groundwater levels noted. Any potential faults or seismic hazards will be investigated as to their potential for structural damage and disruption to the energy supply system.

Information to Be Reviewed/Studies Conducted
General information from the U.S. Geological Survey, the Soil Conservation Service (SCS), and the U.S. Army Corps of Engineers will be utilized. Other geologic information will be obtained from local agencies where applicable. Specific technical studies may be required to evaluate areas of potential for erosion, slope instability, or ground surface subsidence.

Mitigation
No mitigation measures were identified at this level of investigation.

2.1.5 Land Use

Issues Raised during Scoping
No comments on land use were raised during the scoping process.

Additional Issues to Be Addressed in the eis
As part of the eis review, impacts on adjacent land uses (heavy manufacturing) and effects on suitability of land for future planned uses will be addressed. A Phase I environmental site assessment will be performed to evaluate the potential for contamination and to identify underground structures that could impede construction/excavation or affect the groundwater supply.

Information to Be Reviewed/Studies Conducted
Pierce County's updated comprehensive plan will be reviewed. The consistency and compatibility of a new power production facility in the Frederickson Industrial Area will be addressed in light of Federal, state, and local agency policy on existing and future planned land use.

Mitigation
No mitigation measures were identified at this level of investigation.

2.1.6 Natural Resources

Issues Raised during Scoping
No comments were received regarding impacts to natural resources during the scoping process.

Additional Issues to Be Addressed in the eis
Issues to be addressed in the eis include: identification of threatened, endangered, and state-designated special-status wildlife and plant species, habitats, and communities near the proposed Project site; and the potential impact to these resources caused by clearing, construction, and operation of the Project facility.

Information to Be Reviewed/Studies Conducted
Preliminary studies indicate that no threatened, endangered, species of concern, or wetlands have been identified on the site. Field studies would include documenting the absence of the species and demonstrating their low probability of occurrence or harm as a result of the proposed Project. Additional sources of information to be consulted include the U.S. Fish and Wildlife Service (USFWS) on threatened and endangered species; the Washington Department of Wildlife's (WDW) Natural Heritage Database for information on sensitive wildlife, habitats, and sites; the Washington Department of Natural Resources (DNR) for information on threatened or endangered and sensitive plants and habitats; local WDW biologists who may be familiar with the area; Audubon Society members and other amateur naturalists; local residents; National Wetlands Inventory (NWI) maps published by the USFWS; and any published or unpublished reports about the area.

Mitigation
Mitigation measures to be considered would include designing the Project layout to preserve, if possible, the grove of Douglas-fir in the southeast corner of the proposed Project site. Wherever feasible, investigations would be made into the salvage and relocation of young Oregon white oaks, ponderosa pines, and Douglas firs as landscaping.

2.1.7 Noise

Issues Raised during Scoping
A question was raised during the scoping process as to who will do the noise impact study. No other comments on noise were received.

Additional Issues to Be Addressed in the eis
The eis will focus on identifying potential sources of operational noise and noise associated with construction by identifying the significant noise generating equipment to be installed at the plant and the noise control technologies that will be incorporated into the initial plant design. The eis would then describe whether the resulting impacts are in compliance with applicable noise ordinances. It is likely that noise modeling techniques will be necessary to demonstrate whether impacts have been adequately mitigated.

Traffic flow to the plant site will add to existing noise levels. However, traffic is not expected to make a significant contribution to the noise levels near the plant, which is already in an industrialized area.

Although construction noise is expected to influence the noise environment near the plant, construction activities will be of limited duration. Noise ordinances are generally more liberal in regulating noise from construction activities than from industrial sources. Construction activities will be comparable to those commonly encountered in industrial settings, will be of limited duration, and as such will not be addressed in great detail.

Information to Be Reviewed/Studies Conducted
During the scoping meeting, BPA expressed interest in the measures that would be taken to document the existing noise environment (possibly with surveys) and to predict the expected noise impact (possibly with modeling). BPA also asked who would be responsible for accomplishing such measures.

Sources of information to be studied include a characterization of the existing noise environment. A characterization may be accomplished through a review of existing literature (i.e., the Noise Element, Pierce County General Plan) or a review of existing noise surveys for the area. If existing information inadequately describes the noise environment, some level of baseline noise monitoring is suggested.

Applicable noise ordinances and noise descriptors for the affected land uses must be identified. Ordinances are likely to include both operational and construction noise.

Other sources of information to be explored include:

- Applicable county and state noise ordinances
- Applicable limits placed on ambient noise levels based on land use
- Noise Element, Pierce County General Plan
- Existing noise surveys or contour maps
- Manufacturer's noise ratings, including frequency
- Manufacturer's rated insertion losses on noise control equipment
- Manufacturer's noise ratings on construction equipment
- Traffic flow predictions

Manufacturer's data for noise generating equipment and noise control equipment must be collected in advance as input to noise modeling. Some level of analysis, whether it involves modeling or a simpler application of standard sound propagation equations, must be performed in support of the eis.

Mitigation
Mitigation includes noise and vibration controls for the types of industrial equipment used, such as inlet and exhaust silencers, acoustical enclosures, acoustical barriers, and insulation pads. A combination of these controls, specifically incorporated into the initial plant design, can reduce noise levels to within acceptable levels at the locations of sensitive receptors. Noise caused by vibration will be addressed through the engineering design features to maximize operational efficiency and structural integrity.

The need for other mitigation measures may become apparent as the impact analysis progresses. These could include:

- Buffer zones
- Noise barriers
- Additional noise controls like extra enclosures or extra insulation

Mitigation measures for construction noise are limited and typically involve restricted hours of activity, limits on the maximum noise levels produced by construction equipment, and erection of temporary barriers.

2.1.8 Proposed Action and Alternatives

Issues Raised during Scoping
Concerns were raised regarding documentation of the need for generating resources in this area. A supporting comment was made by the Tacoma-Pierce Chamber of Commerce regarding the desirability of production on the west side of the Cascade Range. Additional questions and concerns raised during the scoping process include:

- How will the mitigation money be spent, and how will it mitigate the environmental impacts?

- What other generating proposals is BPA evaluating?
- Who will own the Tenaska generating facility?
- What is the height of the building and its exhaust stack, and how will the facility be situated on the proposed Project site?
- Will the Project be expanded at a later time, thus causing more environmental impacts that should be addressed at this time?
- Are there other power generation plants planned for this area?
- Will the eis evaluate situations where BPA might want to sell the power outside of this area?
- Will the proposed facility stop operating during a high hydro-power producing season?

Additional Issues to Be Addressed in the eis
A complete description of construction, operation, and maintenance will be included in the eis. It will not include documentation explaining BPA's needs for and the desirability of power generation resources available to this region, nor will it address resource allocation scenarios, because these subjects will be covered under the programmatic Resource Program Environmental Impact Statement (RPeis) for the greater resource acquisition program (see Section 1.2 PURPOSE AND NEED).

Information to Be Reviewed/Studies Conducted
Information on the details of the Project will be obtained from Tenaska reports and technical studies. Additional Project information on resource purchase and allocation will be provided by BPA.

Mitigation
Some impacts of the proposed Project could be mitigated by modifying the proposed action. For example, the location of the facility on the property site could be placed in such a way as to minimize noise or visual impacts. Transmission lines could be placed underground to minimize visual impacts and health impacts due to electromagnetic fields. Additional modifications may be suggested as impacts are identified.

2.1.9 Public Health and Safety

Issues Raised during Scoping
Public health and safety concerns that were raised in the scoping process include concerns over odor and gas emissions, plant safety, visibility and heat-emission problems which might affect low-flying airplanes, and potentially cancer-causing electromagnetic fields.

Additional Issues to Be Addressed in the eis
Health effects of electric and magnetic fields (EMF), failure of operating systems (e.g., generators, turbines, cooling tower, natural gas pipeline, and back-up fuel oil, acids, caustics and ammonia tanks/pipes), and other emergencies will be analyzed. The likelihood for off-property impacts from potential accidents involving hazardous materials will be assessed. This analysis will include the identification of potential accidents, the estimation of the likelihood of occurrence, and any off-site impacts that might result, should an accident occur.

Additional Information to Be Reviewed/Studies Conducted
An extensive scientific literature search will be performed about the health effects of EMF, including any current BPA studies. Similar projects which utilize below-ground power lines will be studied as to their safety, cost, and applicability to the proposed Project site. Epidemiological studies of electrical workers or other groups in which the subjects are exposed to high and changing magnetic files will be reviewed for the eis. Nearby sensitive areas, such as homes and schools, will be identified and models used to predict levels of electromagnetic fields within these sensitive areas.

Worst-case studies may be needed to identify ways in which the facility and its components might fail and then to identify the consequences of failure to public health and safety. This evaluation will entail air dispersion modeling for natural gas and chemical releases and investigation of requirements for a spill prevention and containment plan for the back-up fuel oil tank and on-site chemicals. The Federal Aviation Authority requirements will be investigated with regard to steam exhaust in the proximity of a runway flight pattern. If necessary, appropriate toxicological information related to exposure from accidental release of acutely hazardous materials will be reviewed.

Mitigation
No mitigation measures were identified at this level of investigation.

2.1.10 Socioeconomics

Issues Raised during Scoping
No specific comments were received during the scoping process regarding socioeconomic impacts.

Additional Issues to Be Addressed in the eis
Issues that will be addressed in the eis include socioeconomic impacts arising from the proposed Project both in the short term (i.e., construction) and long term (i.e., Project operations). The analysis will focus on direct and indirect impacts on local employment levels, income and local government revenues. If inquiries indicate that some of the construction or operations workers could be drawn from non-local sources, the eis will present potential impacts of the in-migrating workers and their dependents on housing, public services, and utilities in the communities within commuting distance of the proposed Project site.

Positive impacts to the stability of the existing power grid will be addressed.

Information to Be Reviewed/Studies Conducted
Sources of information to be explored include recent employment rates from appropriate state sources, estimation of the number of in-migrating workers, and impacts to adjacent property values.

Mitigation
No mitigation measures were identified at this level of investigation.

2.1.11 Transportation/Traffic

Issues Raised during Scoping
There was some concern expressed during the scoping process specifically addressing impacts on road infrastructure caused by delivery of fuel supplies during a worst-case scenario of extended operation requirements (two weeks) during adverse winter weather conditions.

Additional Issues to Be Addressed in the eis
Issues that will also be addressed include short-term construction worker traffic impacts; load limits on roads, particularly local roads, associated with delivery of turbine generators and any other heavy equipment; operations traffic; and worker traffic impacts. Other issues that may be considered include transmission line and pipeline construction traffic due to workers and trucks, construction worker parking impacts, materials moving in and out, and sustained transport of back-up fuel oil. A safety evaluation of possible accidents associated with back-up fuel oil delivery will be covered in the Health and Safety section of the eis.

Information to Be Reviewed/Studies Conducted
Sources of information to be explored include the City of Tacoma Traffic Department circulation plan, or similar reports or discussions with staff; Tenaska data on construction shipment weights and workforce; and Tenaska data on back-up oil supply volume and delivery plan.

Mitigation
Mitigation efforts would be examined based upon potential impacts from transportation- and traffic-related issues. If use of back-up oil becomes necessary on a long-term basis, and the eis determines that the impacts would be significant, then a contingency plan to improve road surfaces or intersections may be implemented. Another option for this scenario would be to guarantee or require that a new use permit and associated impact study be triggered by such a change in normal operation.

2.1.12 Utilities

Issues Raised during Scoping
All of the comments regarding utilities pertained to water use. Additional comments concerning water are addressed in Section 4.1.14 Water Quality/Water Resources. There were several comments concerning the use of water for operation. This concern encompassed the existence of utility infrastructure to provide a sufficient quantity of water, and to address the source of that water. Other questions included:

- Where will the waste water be routed?
- Is water required 24 hours each day?
- Will groundwater wells be required to supply enough water?

Additional Issues to Be Addressed in the eis
In this section, the cumulative effect with other projects on the water supply will be addressed. The City's anticipated ability to meet potential expansions will be discussed with the Water Department. Other potential impacts associated with non-related proposed projects will be gathered from existing water resources information.

The quality of the City water supply will be investigated and compared to the required water quality for use in the proposed Project. Any required on-site treatment will be identified, along with an estimated cost per cubic meter (gallon). The expected quantity of water

required will be calculated using water/mass balance. This quantity will be compared to the available City water, present and anticipated. The potential addition of water wells by the City to its well field will be discussed with the City. The likelihood of this addition will be addressed in the eis. The City's present and expected future water rates will be updated. The various supply options investigated will be evaluated and compared to determine the most feasible primary supply and back-up.

The expected quantity and quality of waste water to be discharged to the sewer will be estimated. The discharge criteria will be obtained from Pierce County for comparison to the expected waste water quality. If any on-site treatment is expected, it will be investigated and an estimated cost per cubic meter (gallon) will be calculated. Pierce County's charge for sewer discharge will be updated.

An investigation on the potential location of buried cable, pipelines, or other utilities that may
be affected by the proposed Project will be undertaken.

Mitigation
No mitigation measures were identified at this level of investigation.

2.1.13 Visual

Issues Raised during Scoping
A question was raised at the scoping meeting regarding the height of the building and the exhaust stack. No other comments regarding visual impacts of the proposed Project were made.

Additional Issues to Be Addressed in the eis
The eis will identify and map sensitive visual resources (e.g., areas where people may travel, reside, or recreate); inventory existing visual condition and landscape and determine facilities' night lighting; determine the ability of the landscape to absorb the visual impact of the proposed Project; evaluate disturbance of views, particularly to Mt. Rainier; and calculate the effectiveness of mitigation measures and techniques to reduce visual impacts.

Visual impacts from the proposed modifications to the BPA South Tacoma switching station and other visual changes within the right-of-way will be addressed.

A visual plume impact screening analysis for visual impacts to recreation users in Mt. Rainier National Park will be performed by Tenaska as part of the air permit for the Puget Sound Air Pollution Control agency. This information will be a evaluated for incorporation in the eis.

Information to Be Reviewed/Studies Conducted
Sources of information which will be explored include color or black and white aerial photography, the USGS topographic map, and county planning documents containing information about scenic areas or corridors of viewing which are dependent on the quality of the visual environment. In order to meet the requirements of NEPA, certain technical studies will be conducted. The purpose of the technical studies will be to identify and describe visually sensitive landscapes and determine the significance of visual contrast between the Project facility and the existing landscape. The study may include a visual simulation for areas of significant visual impact. The simulation would display before-and-after landscape scenes illustrating the amount of visual change that would occur.

Mitigation
Mitigation measures that would be studied include minimizing earthwork disturbance, utilizing a variety of landscape elements (in form, line, texture, color, scale, and space), and creation of visual barriers.

2.1.14 Water Quality/Water Resources

Issues Raised During Scoping
Concerns raised during the scoping process included the likelihood that the plant would eventually expand, thus requiring more water and this would impact the need for more dams. The remainder of concerns raised on water quality and water resources are addressed in the Utilities section.

Additional Issues to Be Addressed in the eis
This section will discuss surface water quality during construction and operation, and potential impacts to groundwater. Permitting requirements for storm water runoff will be investigated. Other issues to be addressed in this section of the eis are erosion and the resulting sediment loads to surface waters during construction and operation of the facility; impacts on groundwater levels; flow rates from springs and well flow rates due to construction excavation dewatering; impacts to aquifer recharge areas; and water quality impacts of application or spillage of maintenance chemicals, fuels (including the back-up oil supply), lubricants and hydraulic fluids during construction and operation of the facility.

A proposed sole-source aquifer, the Clover-Chambers Creek Basin, is located within the Project area. The EPA proposed designation of sole-source indicates a recognition that the basin relies on groundwater as a water supply source and that the groundwater system is susceptible to contamination. The EPA reviews projects receiving Federal funds which may have an impact on designated sole-source aquifers. Special measures for handling and storing construction materials, fuels, and solvents may be required under this designation if EPA determines that the project would impact the aquifer. The designation for the Clover-Chambers Creek Basin Aquifer will likely be finalized within six months to one year from December 1992.

Water supply issues will be discussed in the Utilities section. Wetland issues will be addressed in the Natural Resources section.

Information to Be Reviewed/Studies Conducted
Hydrologic and hydraulic models may be used to examine the effect of facility structures on drainage and flooding in the Frederickson Industrial Area. Sediment loads to surface water bodies on-site due to erosion during construction and operation will be estimated using erosion and sediment yield models. The impacts of sediment loads on water quality and the violation of applicable water quality standards as well as an evaluation of the proposed storm water detention facility will be addressed. Groundwater flow models may be used to predict the drawdown of aquifer water levels due to excavation dewatering and other Project-related activities where there is reasonable expectation that flow rates from wells, natural springs or groundwater-fed springs could be affected. The resulting impacts on flow rates from wells and in natural springs and groundwater-fed streams will be estimated.

Sources of information include the Supplemental eis for the Boeing-Pierce County Frederickson Site, October 1990, US EPA Sole Source Aquifer program, Pierce County Utilities, Tacoma City Water, and other planning and environmental impact documents from the surrounding area.

Mitigation
No mitigation measures were identified at this level of investigation

2.1.15 Responses to Comments Not Addressed in eis Text

The following comments/questions were presented during the public scoping, but were not discussed in the body of the eis:

Question (A):
Will the eis evaluate situations where BPA might want to sell this power to California? Will the plant be "turned off" during high hydro-generation seasons?

Response (A):
BPA currently transmits power to California during high demand periods (e.g., summer air conditioning) and acquires power from California during Pacific Northwest high-demand periods (e.g., winter heating).

Question (B):
Do the regulatory agencies issue the permit and do they assure the public of compliance?

Response (B):
A number of permits will be required from regulatory agencies before the facility can be built (for a list of permits, see Section 6.0 Environmental Consultation, Review, and Permit Requirements). Periodic reviews and re-issuance of permits varies with each permit.

Question (C):
If/when the plant is built, are there going to be any tours of the facility?

Response (C):
Tenaska has indicated that the proposed facility would be open for tours. Tours would need to be pre-arranged and would be reviewed on a case-by-case basis. Security at the facility would mainly protect people from harm and prevent sabotage.

3.0

3.1 INTRODUCTION

Copies of the Deis for the proposed Tenaska Washington II Generation Project were distributed by mail to interested and affected members of the public for comments. This chapter outlines the Deis public involvement process, and also contains written comments from letters and oral comments from the public meeting.

3.1.1 Comment Period

The Deis was mailed on August 9 and 10, 1993, to approximately 150 agencies, libraries, organizations and individuals. A notice of availability to review the Deis was published in the Federal Register on August 20, 1993. The public review and comment period lasted for 45 days with comments due by October 4, 1993. Commenters could send comments to BPA's Public Involvement Office in Portland, Oregon. BPA provided a toll-free number for commenters. Twenty-one letters were received and 188 comments were coded from these response letters. Copies of the letters are included in Section 3.4.1.

3.1.2 Public Meeting

BPA held one public meeting, on September 8, 1993, to receive oral and written comments on the Deis from the interested public. The meeting was held at Bethel High School in Spanaway, Washington. Bill's Recording Service (Beaverton, Oregon) recorded the meeting and produced a transcript for comment analysis. Thirty-two participants registered at this meeting.

The public meeting was preceded by an open house lasting one hour. During that time, meeting participants could view displays about the proposed project and had the opportunity to converse with BPA and Tenaska personnel. The format of the meeting consisted of: greetings and introductions; background information about BPA's resource acquisition program and NEPA-compliance responsibilities; a project status update; local government involvement; comments from the public; and a question and answer period. Nine people gave public comment from which 68 individual comments were coded; the coded pages of the transcript from the public meeting are included in Section 3.4.2.

3.1.3 Information

The remainder of this Comment Report contains information about the comments received and the responses to these comments. Tables showing summary information about the comments and BPA's responses to these comments are included. Copies of letters, cards and the public meeting transcript are included in the last section. A brief description of the contents of each section is presented at the beginning of each section.

3.2 COMMENT SUMMARY

Section 3.2 consists of two comment summary tables. Table 3.2-1 provides a summary of the comment categories and the number of comments in each category. This table shows the distribution of comments among the categories and provides information on which categories are of most concern to the commenters.

Table 3.2-2 is organized by commenter beginning with Federal agencies followed by state, county, and local agencies then organizations and individuals. Other information included in this table is the Category of the comment, the Comment ID number, the page number in Table 3.3-1 where the comment and response are located, and a brief description of the comment. This table is useful for quickly identifying the concerns of a particular commenter and locating the comment and response.

TABLE 3.2-1 Summary of Comments - Comment Report

Category	Number of Comments

1.0 PURPOSE OF AND NEED FOR ACTION		13
	Subtotal	13
3.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION		8
	Subtotal	8
4.0/5.0 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES		3
GEOLOGY AND SOILS		
Geologic Hazards		1
Soils		3
	Subtotal	7
HYDROLOGY AND WATER QUALITY		
Groundwater		21
Surface Water		8
	Subtotal	29
AIR QUALITY		26
Existing Air Quality		1
Regulatory Requirements		17
Global Warming		18
	Subtotal	62
BIOLOGICAL RESOURCES		1
Vegetation		3
Floodplains/Wetlands		1
Wildlife and Wildlife Habitat		4
Sensitive species		3
	Subtotal	12
LAND USE AND COMMUNITY CHARACTER		1
Existing Land Uses		1
	Subtotal	2
HISTORY AND ARCHAEOLOGY		
Survey Results		1
	Subtotal	1
SOCIOECONOMICS AND PUBLIC SERVICES		5
Employment		4
Tax Revenues		2
Fire Protection		4
	Subtotal	21
PUBLIC HeaLTH AND SAFETY		38
Phase I Environmental Site Assessment		1
	Subtotal	39
TRAFFIC AND TRANSPORTATION		
Growth Trends		2
	Subtotal	2
ENERGY AND UTILITIES		5
Water Supply		10
Sanitary Sewer		15
Storm Drainage		2
Solid Waste Disposal		6
Electricity		5
Natural Gas		9
Back-Up Fuel Oil		2
	Subtotal	54
NOISE		1
	Subtotal	1
VISUAL QUALITY		3
	Subtotal	3
6.0 ENVIRONMENTAL CONSULTATION, REVIEW, AND PERMIT REQUIREMENTS		2
	Subtotal	2
TOTAL COMMENTS		256

TABLE 3.2-2 Commenters and Comments

Commenter ID	Page No. in Table 3.3-1	Topic	Category
U.S.D.A. Soil Conservation Service			
T14		No comments on project	
U.S. EPA			Air Quality
T22/1	3-31	Project is subject to federal permit conditions but not to PSD	
U.S. EPA			Air Quality
T22/2	3-27	Final eis should describe cumulative air quality impacts	
U.S. EPA			Air Quality
T22/3	3-31	Comment regarding statement of PSAPCA emission limits	
U.S. EPA			Air Quality
T22/4	3-27	Inconsistency in time units noted regarding fuel oil	
U.S. EPA			Hydrology/Water Quality
T22/5	3-22	May review and comment if sole source aquifer	
U.S. EPA			Hydrology/Water Quality
T22/5B	3-22	Sole source aquifer designation	

U.S. EPA			Hydrology/Water Quality
T22/6	3-23	Factual error in text	
U.S. EPA			Hydrology/Water Quality
T22/7	3-23	Potential for groundwater contamination	
U.S. EPA			Hydrology/Water Quality
T22/8	3-24	Final eis should reflect NPDES application information	
U.S. EPA			Public Health and Safety
T22/9	3-45	Prevention of spills/clean up should be better documented	
U.S. EPA			Hydrology/Water Quality
T22/10	3-23	Measures to protect groundwater should be commitments	
Northwest Power Planning Council			Public Health and Safety
T24/1	3-45	Possible risks of utilizing hazardous materials	
Northwest Power Planning Council			Public Health and Safety
T24/2	3-45	Potential contamination from accidental release of wastewater	
Northwest Power Planning Council			Public Health and Safety
T24/3	3-45	Potential impacts of hazardous material releases	
Northwest Power Planning Council			Public Health and Safety
T24/4	3-45	Expand scope of potential hazardous material release impacts	
Northwest Power Planning Council			Energy and Utilities
T24/5	3-52	Risks associated with air pollution control catalysts	
Northwest Power Planning Council			Biological Resources
T24/6	3-34	Project is not likely to significantly affect fish	
Northwest Power Planning Council			Hydrology/Water Quality
T24/7	3-24	Potential impacts of deposition of "cooling tower drift"	
Northwest Power Planning Council			Energy and Utilities
T24/8	3-47	Estimate of annual hours of operation on fuel oil	
Northwest Power Planning Council			Noise
T24/9	3-54	Potential vibration from plant operation should be assessed	
Northwest Power Planning Council			Air Quality
T24/10	3-34	Augment discussion of global warming	
Northwest Power Planning Council			Air Quality
T24/11	3-27	Proposed nitrogen oxide control BACT	
Northwest Power Planning Council			Air Quality
T24/11B	3-27	Tables for firing on fuel oil	
Northwest Power Planning Council			Socioeconomics
T24/12	3-37	Specific environmental impacts that should be evaluated	
Northwest Power Planning Council			Energy and Utilities
T24/13	3-54	Fuel oil would be used only as necessary	
Northwest Power Planning Council			Energy and Utilities
T24/14	3-47	Comparison with power plants in Texas is questionable	
WA Dept. of Community Development			History and Archaeology
T8/1	3-36	No registered historic or archaeological sites are in project area	
WA Dept. of Natural Resources			Biological Resources
T15/1	3-35	Incorrect state status of Aster curtus written in Deis text	
WA Dept. of Natural Resources			Biological Resources
T15/2	3-35	Contradiction in text regarding presence of Idaho fescue occurrence	
EDB, Tacoma-Pierce Counties			Purpose and Need
T23/1	3-17	The region needs new electrical power generation	
EDB, Tacoma-Pierce Counties			Energy and Utilities
T23/2	3-52	Support power generation in the proposed location	
EDB, Tacoma-Pierce Counties			Socioeconomics and Public Services
T23/3	3-38	Construction and operation will provide high quality jobs	
EDB, Tacoma-Pierce Counties			Affected Environment
T23/4	3-19	Project will have a minimal environmental impact	
EDB, Tacoma-Pierce Counties			Purpose and Need
T23/5	3-17	Strong endorsement of the Tenaska Washington II project	
Pierce County Dept. of Utilities			Energy and Utilities
T9/1	3-48	Project operation would increase discharge of water pollutants	
Pierce County Dept. of Utilities			Energy and Utilities
T9/2	3-48	Existing sewer extension towards the project site from main line	
Pierce County Dept. of Utilities			Energy and Utilities
T9/3	3-46	Clarify types, handling, recycling, and disposal of wastes	
Pierce County Dept. of Utilities			Energy and Utilities
T9/4	3-48	Wastewater discharge associated with air pollutant stripping?	
Pierce County Dept. of Utilities			Public Health and Safety
T9/5	3-40	Hazardous materials used or generated could be released	
Pierce County Dept. of Utilities			Energy and Utilities
T9/6	3-49	Any potential discharge of listed items may require pretreatment	
Pierce County Dept. of Utilities			Energy and Utilities
T9/7	3-51	Materials discharged outside can't include storm water runoff	
Pierce County Dept. of Utilities			Energy and Utilities
T9/8	3-51	Describe types and amount of wastes for disposal and recycling	
Pierce County Dept. of Utilities			Energy and Utilities
T9/9	3-51	Clarify intended disposal of wastes in or out of Pierce County	
Pierce County Dept. of Utilities			Energy and Utilities
T9/10	3-49	Aqueous wastes would discharge into Pierce County's system	
Pierce County Dept. of Utilities			Air Quality
T9/11	3-29	Project is in an area which has a burning ban	
Pierce County Dept. of Utilities			Energy and Utilities
T9/12	3-51	Recycle as much of the land clearing debris as possible	

Pierce County Fire Prevention Bureau			Public Health and Safety
T7/1	3-40	Concern regarding hazardous material release	
Pierce County Fire Prevention Bureau			Public Health and Safety
T7/2	3-40	Large fuel oil storage tank presents potential fire problem	
Pierce County Fire Prevention Bureau			Public Health and Safety
T7/3	3-40	Storage and handling of hazardous substances	
Pierce County Fire Prevention Bureau			Socioeconomics
T7/4	3-38	Some fire protection needs are not clearly identified in Code	
Pierce County Fire Prevention Bureau			Socioeconomics
T7/5	3-39	Should be more detail on needs for the fire protection system	
Tacoma-Pierce County Health Department			Public Health and Safety
T17/1	3-41	Design fuel oil storage tanks for "worst case" spill	
Tacoma-Pierce County Health Department			Energy and Utilities
T17/2	3-49	Water from containment structure should be treated for disposal	
Tacoma-Pierce County Health Department			Public Health and Safety
T17/3	3-41	Monitoring features to determine potential fuel piping leakage	
Tacoma-Pierce County Health Department			Hydrology/Water Quality
T17/4	3-21	The project site is not underlain by Vashon till as stated in text	
Tacoma-Pierce County Health Department			Hydrology/Water Quality
T17/5	3-21	Groundwater flow direction in basin toward "the Narrows"	
Tacoma-Pierce County Health Department			Energy and Utilities
T17/6	3-48	Public wells and water systems within the "three mile radius"	
Tacoma-Pierce County Health Department			Hydrology/Water Quality
T17/7	3-21	Groundwater quality in area has been undergoing degradation	
Tacoma-Pierce County Health Department			Biological Resources
T17/8	3-35	Potential groundwater contamination in wetland area	
Tacoma-Pierce County Health Department			Hydrology/Water Quality
T17/9	3-21	Submittal of hydrogeological assessment required	
Tacoma-Pierce County Health Department			Hydrology/Water Quality
T17/10	3-22	Potential pollution impacts to groundwater recharge area	
Tacoma-Pierce County Health Department			Public Health and Safety
T17/11	3-41	Completion of SPCC and Hazardous Materials Handling Plan	
Tacoma-Pierce County Health Department			Hydrology/Water Quality
T17/12	3-22	Area is extremely vulnerable to groundwater contamination	
Tacoma Public Utilities (Water Division)			Energy and Utilities
T13/1	3-47	Adequate water supply needs for the project	
Tacoma Public Utilities (Water Division)			Hydrology/Water Quality
T13/2	3-20	Correction regarding authority over public wells	
Tacoma Public Utilities (Water Division)			Energy and Utilities
T13/3	3-47	Water service for the project is planned	
Tacoma Public Utilities (Water Division)			Energy and Utilities
T13/4	3-48	Correction of employment division for "persons consulted"	
Tacoma Public Utilities (Water Division)			Public Health and Safety
T13/5	3-41	Recommend Ecology guidelines for spill containment	
Tacoma Public Utilities (Water Division)			Hydrology/Water Quality
T13/6	3-20	Will a groundwater monitoring program be implemented?	
Tacoma Public Utilities (Water Division)			Hydrology/Water Quality
T13/7	3-21	Mitigation measures for protection of groundwater quality	
Tacoma Public Utilities (Water Division)			Energy and Utilities
T13/8	3-48	Integrate water conservation features into project design	
Tacoma Public Utilities (Light Division)			
T21		No Comments on project	
Clover Creek Council			Energy and Utilities
T11/1	3-47	Concern over water supply needs for project	
Clover Creek Council			Hydrology/Water Quality
T11/2	3-20	Potential depletion of the aquifer in the future	
Clover Creek Council			Energy and Utilities
T11/3	3-47	Concerns about efficient use of steam	
Clover Creek Council			Visual Quality
T12/1	3-54	Visibility of steam plume from plant	
Clover Creek Council			Air Quality
T12/2	3-25	Potential long term effects of releasing steam into air	
Clover Creek Council			Visual Quality
T12/3	3-54	Steam plume	
Clover Creek Council			Energy and Utilities
PM52	3-47	Concern about water requirements for project	
Clover Creek Council			Energy and Utilities
PM53	3-52	More efficient use of excess steam heat	
Clover Creek Council			Visual Quality
PM54	3-54	Concern about visual effects of steam plume	
Greenhouse Action			Purpose and Need
PM38	3-17	The Northwest is embarking on a fossil fuel-based energy future	
Greenhouse Action			Air Quality
PM39	3-29	Natural gas is a "cheap fix" for our energy needs	
Greenhouse Action			Air Quality
PM40	3-29	Potential impacts and costs of regulation of carbon dioxide	
Greenhouse Action			Purpose and Need
PM41	3-17	The need for power, for what set of customers, fuel switching	
Greenhouse Action			Air Quality
PM42	3-24	Increase in CO2 emissions due to using natural gas turbines	
Greenhouse Action			Energy and Utilities

PM43	3-53	Cumulative effects of gas generation and effects on Northwest Greenhouse Action	Air Quality
PM44	3-29	Insurance against the risk of future CO2 regulation Greenhouse Action	Energy and Utilities
PM45	3-54	Supply availability of back-up fuel oil Greenhouse Action	Air Quality
PM46	3-25	Extreme cold weather conditions and air quality emergencies Greenhouse Action	Alternatives
PM47	3-18	Compare gas-fired generation with fuel choice options Greenhouse Action	Air Quality
PM48	3-29	Ratepayers are at the risk of paying for CO2 mitigation costs Greenhouse Action	Air Quality
PM49	3-32	Does not understand statement that "natural gas is benign" Greenhouse Action	Purpose and Need
PM65	3-17	Project cost has not been realistically factored Greenhouse Action	Socioeconomics
PM68	3-37	Project would take up airshed and provide few jobs Greenpeace	Energy and Utilities
T18/1	3-53	Greenpeace opposed to using natural gas in combustion turbines Greenpeace	Air Quality
T18/2	3-25	CO2 content in natural gas is significant enough for concern Greenpeace	Air Quality
T18/3	3-33	Methane content of natural gas; a potent greenhouse gas Greenpeace	Air Quality
T18/4	3-30	Compliance with more strict air quality regulations Greenpeace	Air Quality
T18/5	3-33	Importance of global warming issue Greenpeace	Air Quality
T18/6	3-33	Source-referenced comment regarding global warming Greenpeace	Air Quality
T18/6B	3-25	Carbon sequestration does not address problems with fossil fuels Greenpeace	Socioeconomics
T18/7	3-37	Beneficial impact of project on community would be minimal Greenpeace	Socioeconomics
T18/8	3-37	Renewable resources employ more people than fossil fuel Greenpeace	Alternatives
T18/9	3-19	Endorsement of renewable energy sources Greenpeace	Energy and Utilities
T18/10	3-53	Address nonlocal impacts of utilizing natural gas Greenpeace	Energy and Utilities
T18/11	3-53	One-third of all natural gas found in Canada is sour Greenpeace	Public Health and Safety
T18/12	3-41	Potential dangers of natural gas wells in Canada Greenpeace	Biological Resources
T18/13	3-35	Adverse impact of oil/gas exploration on grizzly bear habitat Greenpeace	Biological Resources
T18/14	3-34	Concern over destruction of boreal forests Greenpeace	Public Health and Safety
T18/15	3-41	Address cumulative impacts of utilizing natural gas Greenpeace	Air Quality
T18/16	3-34	Comment regarding emissions should be added to eis LASER	Air Quality
T25/1	3-27	Actual NOx emission will be nearly tripled LASER	Air Quality
T25/1B	3-28	eis should discuss alternative NOX control technologies LASER	Public Health and Safety
T25/2	3-46	Consider using aqueous (not anhydrous) ammonia LASER	Public Health and Safety
T25/3	3-46	Risk assessment of potential hazardous substance(s) release LASER	Air Quality
T25/4	3-28	Describe impact of "sulfur mist" emissions LASER	Energy and Utilities
T25/5	3-52	Plant may use a regeneration system to treat wastewater LASER	Air Quality
T25/6	3-28	Project is located within a no-burn zone Rebound	Air Quality
T19/1	3-30	Potential for localized areas with a higher level of air pollutants Rebound	Air Quality
T19/2	3-30	Determination of significant impact on air quality within an eis Rebound	Public Health and Safety
T19/3	3-41	Any contribution to present air pollutant levels is significant Rebound	Air Quality
T19/4	3-25	Production of low-level ozone due to nitrogen oxides Rebound	Air Quality
T19/5	3-30	Background levels of specific air pollutants Rebound	Public Health and Safety
T19/6	3-42	Air pollution by mobile sources (construction equipment, etc.) Rebound	Air Quality
T19/7	3-25	Impacts to Mt. Rainier National Park from SO2 emissions Rebound	Air Quality
T19/8	3-26	Pollutants making up the total VOC emission limit	

Rebound			Air Quality
T19/9	3-30	Ability to attain compliance with PSAPCA's standards	
Rebound			Public Health and Safety
T19/10	3-42	Adverse health impacts from increase in air pollutant levels	
Rebound			Public Health and Safety
T19/11	3-42	Concern about increasing PM-10 levels in the air	
Rebound			Public Health and Safety
T19/12	3-42	Sources of PM-10 and TSP that should be discussed in eis	
Rebound			Air Quality
T19/13	3-30	Project is located within a no-burn zone	
Rebound			Geology and Soils
T19/14	3-19	Potential earth shaking raises concern about an ammonia release	
Rebound			Public Health and Safety
T19/15	3-42	Information provided in eis regarding ammonia emissions	
Rebound			Air Quality
T19/16	3-26	Assumptions on which the air quality models are based	
Rebound			Public Health and Safety
T19/17	3-42	Analysis of a worst case controlled ammonia spill	
Rebound			Air Quality
T19/18	3-26	Cumulative impacts of ammonia sources should be discussed	
Rebound			Air Quality
T19/19	3-26	Correlate air quality parameters with an odor threshold	
Rebound			Air Quality
T19/20	3-26	Conversion of ammonia emissions to formation of NOx	
Rebound			Public Health and Safety
T19/21	3-43	Concern regarding risks associated with use of ammonia	
Rebound			Public Health and Safety
T19/22	3-43	Potential for a transportation accident involving ammonia	
Rebound			Public Health and Safety
T19/23	3-43	eis should discuss use of aqueous ammonia	
Rebound			Public Health and Safety
T19/24	3-43	Possible alternative design that does not use ammonia	
Rebound			Energy and Utilities
T19/25	3-48	Timing of peak hour water consumption requirements	
Rebound			Energy and Utilities
T19/26	3-48	Potential impacts of project water needs on future development	
Rebound			Socioeconomics
T19/27	3-39	Impact to ratepayers of utility construction work	
Rebound			Energy and Utilities
T19/28	3-49	Clarification regarding what system would receive wastewater	
Rebound			Energy and Utilities
T19/29	3-49	Compliance with laws and regulations for wastewater discharge	
Rebound			Energy and Utilities
T19/30	3-49	eis should have detailed account of water treatment chemicals	
Rebound			Energy and Utilities
T19/31	3-49	Impact of wastewater discharge on sewage treatment system	
Rebound			Energy and Utilities
T19/32	3-50	Potential addition of metal pollutants to sanitary wastewater	
Rebound			Socioeconomics
T19/33	3-37	Potential impact to ratepayers of utilities infrastructure, etc.	
Rebound			Hydrology/Water Quality
T19/34	3-22	Large water demand may adversely affect aquifer	
Rebound			Public Health and Safety
T19/35	3-43	Contamination of area's present and future water supply	
Rebound			Hydrology/Water Quality
T19/36	3-22	Underlying soils are extremely permeable	
Rebound			Hydrology/Water Quality
T19/37	3-23	eis should provide more detail regarding mitigation plans	
Rebound			Air Quality
T19/38	3-34	Possible contribution of steam discharge to global warming	
Rebound			Air Quality
T19/39	3-34	Mitigation of emissions that contribute to global warming	
Rebound			Geology and Soils
T19/40	3-20	Mitigation measures for erosion and runoff control	
Rebound			Geology and Soils
T19/41	3-20	Concern regarding erosion and silt deposition	
Rebound			Hydrology/Water Quality
T19/42	3-23	Status of project's application for a NPDES storm water permit	
Rebound			Public Health and Safety
T19/43	3-43	Negative implications of storm water management design	
Rebound			Public Health and Safety
T19/44	3-43	Treatment systems for oil and grease	
Rebound			Public Health and Safety
T19/45	3-44	Runoff considerations for areas containing toxic substances	
Rebound			Hydrology/Water Quality
T19/46	3-23	Storm-water contaminant removal in the vadose zone	
Rebound			Hydrology/Water Quality
T19/47	3-24	Bioswale liner could not be "totally" impervious	
Rebound			Public Health and Safety
T19/48	3-46	Soil, groundwater sampling and groundwater monitoring wells	
Rebound			Energy and Utilities

T19/49	3-51	Destiny of various solid wastes to be generated by project	Energy and Utilities
T19/50	3-50	eis should describe demineralizer and its waste stream	Public Health and Safety
T19/51	3-44	Prevention of bacterial growth (Legionnaires disease)	Public Health and Safety
T19/52	3-44	Composition and potential effects of a chemical (DCL 500)	Biological Resources
T19/53	3-35	Describe status of agencies' review of oak stands on the site	Biological Resources
T19/54	3-36	Habitat for TES species that could potentially be impacted	Traffic and Transportation
T19/55	3-46	Discuss project's impact on traffic volume	Socioeconomics
T19/56	3-37	Consideration of several project workforce aspects	Public Health and Safety
T19/57	3-44	BACT and construction techniques to ensure public health/safety	Socioeconomics
T19/58	3-38	Construction worker training in apprenticeship programs	Energy and Utilities
T19/59	3-52	Should select alternative of burying power lines	Air Quality
T19/60	3-27	Consider installing a water saving, air cooling system	Energy and Utilities
T19/61	3-50	Water recovery method to treat and reuse blowdown water	Purpose and Need
T19/62	3-17	Discuss reasons for not siting plant next to a steam host	Alternatives
T19/63	3-19	eis does not discuss alternative sites for proposed project	Alternatives
Tahoma Audubon Society			
PM55	3-18	BPA has not considered conservation proposals at a lower cost	Alternatives
Tahoma Audubon Society			
PM56	3-18	Identifiable conservation and efficiency projects	Air Quality
Tahoma Audubon Society			
PM57	3-32	Concern for carbon dioxide's contribution to global warming	Air Quality
Tahoma Audubon Society			
PM58	3-32	Global environmental impact of increased CO2 emissions	Air Quality
Tahoma Audubon Society			
PM59	3-25	Half to nearly all plant emissions would remain unmitigated	Air Quality
Tahoma Audubon Society			
PM60	3-32	Importance of global warming as threat to future of humanity	Socioeconomics
Tahoma Audubon Society			
PM61	3-36	Society cannot afford the proposed project	Socioeconomics
Tahoma Audubon Society			
PM62	3-37	Ratepayers at risk for potential costs of fossil fuel dependence	Alternatives
Tahoma Audubon Society			
T10/1	3-18	No project, or a different project, would be preferable	Air Quality
Tahoma Audubon Society			
T10/2	3-33	Concern about carbon dioxide's contribution to global warming	Air Quality
Tahoma Audubon Society			
T10/3	3-29	Possible initiation of a carbon tax during project's lifetime	Air Quality
Tahoma Audubon Society			
T10/4	3-33	Concern regarding carbon dioxide emissions	Air Quality
Tahoma Audubon Society			
T10/5	3-25	Nearly all the plant emissions would remain unmitigated	Air Quality
Tahoma Audubon Society			
T10/6	3-29	Insurance coverage for carbon risks associated with project	Socioeconomics
Tahoma Audubon Society			
T10/7	3-37	Risk to ratepayers for potential costs of fossil fuel dependence	Hydrology/Water Quality
Tenaska Washington Partners II, L.P.			
T20/1	3-24	Discussion of NPDES permit should be updated	Environmental Consultation, Review, and Permit Requirements
Tenaska Washington Partners II, L.P.			
T20/2	3-55	Tenaska will apply for a construction permit for project	Land Use and Community Character
Tenaska Washington Partners II, L.P.			
T20/3	3-36	Project is included in Draft Pierce County Comprehensive Plan	Energy and Utilities
Tenaska Washington Partners II, L.P.			
T20/4	3-52	Clarification of name as "Tenaska Washington Partners II, L.P."	Public Health and Safety
Tenaska Washington Partners II, L.P.			
T20/5	3-45	Configuration of fuel oil storage area	Energy and Utilities
Tenaska Washington Partners II, L.P.			
T20/6	3-50	Wastewater discharge meets requirements of Pierce County	Air Quality
Tenaska Washington Partners II, L.P.			
T20/7	3-31	No comments were received on project's air permit application	Biological Resources
Tenaska Washington Partners II, L.P.			
T20/8	3-35	Impacts to vegetation and habitat along utility corridors	Socioeconomics
Tenaska Washington Partners II, L.P.			
T20/9	3-38	Estimated taxes should be expressed as annual amounts	Traffic/Transportation
Tenaska Washington Partners II, L.P.			
T20/10	3-46	Output is not dependent upon the manpower on site	

Tenaska Washington Partners II, L.P.			Energy and Utilities
T20/11	3-47	Types of wastes, handling, recycling and disposal	
Tenaska Washington Partners II, L.P.			Environmental Consultation,
T20/12	3-55	Add five permits to list of required permits for project	
			Review, and Permit Requirements
UA Local No. 82			Socioeconomics
T26/1	3-39	Sprinkler systems for fire control of flammable substances	
UA Local No. 82			Socioeconomics
T26/2	3-39	The need to plan and discuss fire prevention measures	
UA Local No. 82			Energy and Utilities
T26/3	3-50	Discharge of storm water from the project site	
Abraham, Clark			Alternatives
PM7	3-18	Technology for renewable energy resources is available	
Abraham, Clark			Air Quality
PM8	3-31	Natural gas is not environmentally friendly	
Abraham, Clark			Air Quality
PM9	3-31	Methane is a global warming gas	
Abraham, Clark			Energy and Utilities
PM10	3-53	Natural gas will be supplied from Canadian sources	
Abraham, Clark			Energy and Utilities
PM11	3-53	A third of natural gas from Canada is "critically sour"	
Abraham, Clark			Energy and Utilities
PM12	3-53	Risk of human exposure to hydrogen sulfide gas	
Abraham, Clark			Land Use and Community
PM13	3-36	Does not want a natural gas plant near where he lives	
			Character
Giddings, Roxy			Hydrology/Water Quality
PM26	3-20	Concern about groundwater and the aquifer	
Giddings, Roxy			Energy and Utilities
PM27	3-50	Concern about groundwater/aquifer recharge	
Giddings, Roxy			Hydrology/Water Quality
PM28	3-20	Concern about groundwater/aquifer recharge	
Giddings, Roxy			Hydrology/Water Quality
PM29	3-20	Concern about groundwater issues and well water	
Giddings, Roxy			Biological Resources
PM30	3-34	Potential for saving some of the oak stand on the project site	
Giddings, Roxy			Biological Resources
PM31	3-35	Concern about wildlife that potentially inhabits the project site	
Giddings, Roxy			Hydrology/Water Quality
PM32	3-23	Storm water runoff mitigation measures	
Giddings, Roxy			Geology and Soils
PM33	3-19	Concern about soil erosion during construction period	
Giddings, Roxy			Biological Resources
PM34	3-35	Concern about loss of wildlife habitat	
Giddings, Roxy			Hydrology/Water Quality
PM35	3-20	Concern about groundwater	
Giddings, Roxy			Air Quality
PM36	3-32	Concern about global warming	
Giddings, Roxy			Purpose and Need
PM37	3-17	It would be more cost-efficient to use natural gas directly	
Iverson, Earl			Energy and Utilities
PM50	3-47	Concern about availability of water	
Iverson, Earl			Public Health and Safety
PM51	3-40	Health and safety issues related to natural gas	
King, Jill			Air Quality
PM1	3-28	The project area currently has air-quality problems	
King, Jill			Purpose and Need
PM2	3-16	Building a gas-fired plant is in contradiction to state policy	
King, Jill			Purpose and Need
PM3	3-16	Concern about dependency on fossil fuels as energy source	
King, Jill			Energy and Utilities
PM4	3-52	Gas is more polluting and costly than public is led to believe	
King, Jill			Alternatives
PM5	3-18	Renewable energy sources would be more efficient	
King, Jill			Affected Environment
PM6	3-19	Consider environmental impacts and long-term solutions	
Lane, Steve			Purpose and Need
PM14	3-16	A gas-fired plant should not be chosen to meet energy needs	
Lane, Steve			Energy and Utilities
PM15	3-46	Dependency on fossil fuel and foreign imports	
Lane, Steve			Energy and Utilities
PM16	3-53	Availability and supply of natural gas in the United States	
Lane, Steve			Air Quality
PM17	3-31	Natural gas is said to be a clean-burning fuel, which isn't true	
Lane, Steve			Purpose and Need
PM18	3-16	The future of gas-fired plants involves increased use of coal	
Lane, Steve			Public Health and Safety
PM19	3-40	Health risks to community based around the project site	
Lane, Steve			Purpose and Need
PM20	3-16	Development of renewable resources for a sustainable future	
Lane, Steve			Socioeconomics

PM21	3-38	Renewable energy resources are economically viable	
Lane, Steve			Air Quality
PM66	3-29	The Clean Air Act and air quality standards in the region	
Meek, Daniel			Purpose and Need
T16/1	3-17	BPA is not acquiring all cost-effective conservation resources	
Schipper, Matthew			Socioeconomics
PM22	3-36	Questions the cost-efficiency of the proposed project	
Schipper, Matthew			Socioeconomics
PM23	3-36	The fossil fuels industry in U.S. is subsidized with tax money	
Schipper, Matthew			Public Health and Safety
PM24	3-40	Concern about accidents associated with gas plants	
Schipper, Matthew			Purpose and Need
PM25	3-16	Renewable energy resources are for the longer term	
Schipper, Matthew			Air Quality
PM63	3-32	Long-term costs of carbon dioxide and methane emissions	
Schipper, Matthew			Socioeconomics
PM64	3-37	True cost of project (health, global, future) cannot be figured	
Schipper, Matthew			Air Quality
PM67	3-25	Concern about increase in air pollution due to project	
Williams, John			Air Quality
T27/1	3-28	NOx should be recognized as an ozone precursor in Feis	

3.3 COMMENTS AND RESPONSES

Section 3.3 contains the responses to the comments that were received. Table 3-1, in addition to the comments and responses, also provides certain comment information such as the Comment ID number, the Comment Author and the Organization represented, if noted. The comments in Table 3.3-1 are arranged by category. A shaded bar with the category name precedes those comments assigned to that category. Categories are presented in the same order as in Table 3.2-1.

A key for Table 3.3-1 immediately precedes the table. This key is useful in explaining the Comment Identification (ID) number and how it can be used to locate a particular comment in its full context in Section 3.4, Comment Documents.

Key for Table 3.3-1 Comments and Responses and for the Comment Documents

Comments

Example

Table 3.3-1: Comments and Responses

Comments on the Deis are of two typ
oral comments received at the publi
meeting and written comments in letters and cards.

The oral comments are identified by "PM" followed by a number (PM6) which is annotated in the right margin of the transcript pages. The pages from the transcript containing the oral comments is located in Section 3.4.2.

Written comments are identified by a "T" followed by number (document number), a "/" and a second number (comment number) (T20/12). Letters and cards containing the written comments are in Section 3.4.1.

Other comment information in Table 3.3-1 includes:

Author of the Comment

Organization Represented

Example Comment Letter

Comment Identifiers are composed of the document number and the numerically ordered comment number within the document.

T7/2 identifies the second comment on Document T7.

Document Number is placed on each page of the letter. Letters and cards are arranged in numerical order in Section 3.4.1, Written Comments.

The transcript is preceded by an index that shows the commenters and the transcript page numbers where the respective comments appear.

Figure (Page 3-15 Key for Table 3.3-1:...)

TABLE 3.3-1 COMMENTS AND RESPONSES

Comment Information	Comments and Responses
PURPOSE OF AND NEED FOR ACTION	
PM2 King, J. None Stated	Comment: The state has made an official commitment to conservation and renewable energy resources. Building a gas-fired plant is clearly in contradiction to this policy. Response: BPA has also made a commitment to conservation and renewable energy resources. In its April 1993 Record of Decision on the Resource Programs Environmental Impact Statement, BPA chose the Emphasize Conservation Alternative as its preferred alternative. This means that BPA will acquire all cost-effective conservation and efficiency improvements. In addition, BPA will acquire additional conservation resources as their supply, cost-effectiveness, and reliability are validated. However, conservation resources alone do not satisfy the need for resources. Conservation must be supplemented by a mix of renewables and thermal resources. Tenaska Washington II is being considered as one of those thermal resources.
PM3 King, J. None Stated	Comment: If we're planning for the future, not five or ten years down the road, we've got to begin moving away from fossil fuels as a primary energy source. Response: BPA's Resource Programs eis looked at resource acquisitions over a 20-year planning period - through 2010. In the Record of Decision, a mix of conservation and generation resources was determined to be the most cost-effective and environmentally responsible. The thermal resources included both cogeneration and gas-fired combustion turbines.
PM14 Lane, S. None Stated	Comment: I find it reprehensible that these needs are to be answered with a gas-fired power plant. Response: After thoroughly analyzing the environmental trade-offs among energy resource types and the cumulative environmental effects of adding combinations of these resources to the existing power system, the BPA Administrator determined that acquiring all cost-effective conservation and efficiency improvements, supplemented by a mix of renewables and thermal resources (including combustion turbines and cogeneration) was the most cost-effective, reliable, and environmentally responsible approach.
PM18 Lane, S. None Stated	Comment: The truer picture for the future of gas-fired plants is one of coal-fired plants with natural gas providing 10 percent of the fuel and coal providing 90 percent in the combustion process. Response: Coal gasification technology is still under development with several demonstration facilities in operation. Performance and economic evaluations are being performed for different gasification processes and coal types. While it is possible that coal gasification will play a role in providing primary or alternative fuel to gas-fired turbines in the future, it would not be expected to play a role in the early years of the Tenaska plant operation. In addition, the President's Climate Change Action Plan encourages the use of natural gas in coal fired power plants to reduce the emissions of CO2.
PM20 Lane, S.	Comment: Someone with courage would put their foot down and lead us toward a

sustainable future, and further acquisitions
None Stated of gas-fired resources would be set aside for the development of renewable sources such as wind, geothermal and
solar energy.
Response:
BPA is actively pursuing two geothermal pilot projects and two wind projects under its Resource Supply Expansion
Program. However, there is a limited, cost-effective supply of renewable resources available to BPA in the
region.
PM25 Comment:
Schipper, M. Things like solar power, wind power, conservation, energy efficiency, all are for the long term.
None Stated Response:
BPA is committed to pursuing all cost-effective conservation and renewable energy resources as well as energy
efficiency improvements.
PM37 Comment:
Giddings, R. It would be a lot cheaper if we just took the natural gas and ran it into our house and heated our water or
None Stated whatever. It would be cheaper for us to use the natural gas in the way it comes out of the ground.
Response:
BPA's role is to fulfill a statutory obligation to meet the electrical needs of its customers, based on the
acquisition of resources determined best suited to serve this need. BPA encourages all end-users to evaluate
the most cost-effective, environmentally sound means of meeting their end-use needs. For many end-users, direct
application of natural gas is more efficient than using natural gas in the intermediate stage converting it to
electricity at a power plant.
PM38 Comment:
Holbrook, N. The Northwest is about to embark on a fossil fuel-based energy future, utilizing what one government official
Greenhouse Action refers to as the "crack cocaine of the electric utilities."
Response:
Comment noted.
PM41 Comment:
Holbrook, N. What is the actual need for the Tenaska Power? How will future DSI contracts affect this need? How is the
Greenhouse Action region's fuel switching potential going to offset the need for large, gas-fired generation?
Response:
This project would provide firming of non-firm hydro, voltage support in a high load geographic area and the
need for the power. The BPA Administrator will reassess this need prior to signing the Tenaska power purchase
agreement in 1994.
PM65 Comment:
Holbrook, N. Cost is important and what we're saying is that you haven't accurately factored in realistically the costs.
Greenhouse Action Response:
Cost effectiveness is a primary selection criteria and BPA believes that it employed a sound system cost
analysis in the evaluation of the proposals.
T16/1 Comment:
Meek, D. BPA is not acquiring all cost-effective conservation. Mr. Meek references attachments to his letter: Testimony
None Stated of Richard Esteves to US House of Reps, July 12, 1993, and a letter of September 23, 1993 from Mr. Meek to Peter
DeFazio.
Response:
The Emphasize Conservation Alternative was identified as the preferred alternative in the 1993 Record of
Decision on the Resource Programs eis. Under this alternative, all cost-effective conservation will be
acquired. In this ROD, BPA also committed to actively investigate additional conservation resources, and to
acquire them as their supply, cost-effectiveness, and reliability were validated.
T19/62 Comment:
Herman, O. The Deis fails to discuss any reason why the Tenaska power plant could not be sited next to an industrial host
Rebound which would serve as a customer for this plant's spent steam (cogeneration).
Response:
Provisions are incorporated into the plant design so that steam could be supplied to a future industrial steam
host.
T23/1 Comment:

Mork, E. The region needs new electrical power generation. Failure to provide for continued growth of electrical demand
EDB Pierce Co. is a recipe for economic stagnation.
Response:
Comment noted.
T23/5 Comment:
Mork, E. Therefore, we at the EDB strongly endorse the construction of the Tenaska Washington II project located at
EDB Pierce Co. Frederickson.
Response:
Comment noted.

ALTERNATIVES INCLUDING THE PROPOSED ACTION
PM5 Comment:
King, J. Conservation programs and renewable energy sources - we all know that these methods would be extremely clean and
None Stated efficient and create more jobs that would stay local.
Response:
BPA is committed to evaluating, within a competitive bidding process, all resource proposals including those
for conservation resources and renewable energy resources. Cost-effectiveness is a primary selection criteria.
However, even renewable resources may create adverse environmental impacts.
PM7 Comment:
Abraham, C. First, I would like to say that the technology for renewable energy resources such as wind and solar is
None Stated available and can be implemented rapidly.
Response:
BPA considers renewable resources - hydro, geothermal, wind, and solar - in its resource planning. The Resource
Programs eis included an examination of the technology, operating characteristics, supply, costs, and
environmental effects and mitigation for each of these renewable energy resources. Renewable resources were
included in BPA's preferred alternative in the 1993 Record of Decision (ROD). Moreover, BPA committed in that
ROD to use the Resource Supply Expansion Program to confirm the supply, cost, and reliability of additional
conservation and renewable energy supplies.
PM47 Comment:
Holbrook, N. With BPA's fuel choice program scheduled to run through 1995, why not at least compare the possible benefits of
Greenhouse Action gas-fired generation with fuel choice options?
Response:
This concern was addressed in BPA's Resource Programs eis which included a comparison of energy resource types,
including gas-fired combustion turbines and fuel switching. This comparison is not within the scope of this
eis.
PM55 Comment:
Giddings, W. Despite testimony before the Northwest Power Planning Council from public utilities, BPA has refused to
Tahoma Audubon participate in conservation proposals at a lower cost than this proposal, including one from Snohomish PUD for
Society 240 MW equal in yield to this project.
Response:
BPA considers a variety of resources for potential acquisition, based on costs, environmental impacts, timing,
risk, reliability, effects on the system, and other parameters. BPA is committed to its conservation program
and considers all proposals for conservation resources that are demonstrably cost-effective.
PM56 Comment:
Giddings, W. There is no evidence that identifiable conservation and efficiency projects would not be a better choice
Tahoma Audubon environmentally.
Society Response:
BPA has committed to acquire all cost-effective conservation and efficiency improvements.
T10/1 Comment:
Giddings, W. Action on the project cannot be taken until after the end of the comment period for this eis, so it is not too
Tahoma Audubon late for BPA to conclude that no project, or a different project, would be preferable to this one.
Society Response:
BPA has a statutory obligation, if requested, to meet the load growth of its customers. BPA's Resource Programs
eis supports the conclusion that, because of limitations in the supply of cost-effective conservation resources,
even aggressive conservation acquisition programs would not provide

enough conservation energy to meet high load growth. Within a competitive bidding process, Tenaska Washington II has demonstrated that it can assist in meeting this growing electrical need; and best met our viability, system cost, and environmental criteria.

T18/9 Schullinger, S. Greenpeace

Comment:
A renewable plant can provide a local community with more employment opportunity, zero emissions and would create no upstream development impacts.
Response:
Renewable resources also can cause significant environmental impacts; for example, wind, geothermal, and hydroelectrical resources are likely to be located in remote areas requiring new transmission corridors and lines resulting in environmental impacts. There can also be impacts from the resources themselves. Refer to BPA's RPeis for an analysis of the environmental trade offs among resource types.

T19/63 Herman, O. Rebound

Comment:
The Deis does not present an alternative configuration of this project involving a different site for the plant that would allow it to be a more efficient, environmentally beneficial cogeneration facility.
Response:
The Tenaska Washington II project is proposed to be located in an existing industrial area where needed infrastructure such as substation, gas pipeline, and sewerage system already exist. In a competitive resource selection process, this project has demonstrated that it can help to meet growing electrical needs in the Northwest in the most environmentally and economically sound manner. The project is designed to allow for future cogeneration steam supply should an industry which needs process steam locate in the industrial area.

AFFECTED ENVIRONMENT

PM6 King, J. None Stated

Comment:
Please consider the true environmental impact on this community as well as finding lasting solutions for the future.
Response:
The Tenaska Washington II Draft eis included an analysis of the environmental effects on the natural environment as well as a consideration of social and economic effects on the community. BPA's Resource Programs eis and ROD support energy resource actions to meet BPA's contractual obligations to serve electrical load, taking into consideration the environmental consequences of those actions.

T23/4 Mork, E. EDB Pierce Co.

Comment:
Project will have a minimal environmental impact. The Frederickson site is intended for industrial development. Project meets all environmental requirements and has gone through an extensive BPA screening of potential generation project candidates.
Response:
Comment noted.

GEOLOGY AND SOILS — Geologic Hazards

T19/14 Herman, O. Rebound

Comment:
Earth shaking in the project area could compound the concern regarding the potential for an ammonia release.
Response:
The plant buildings, equipment and process systems will be designed to code requirements for Seismic Zone 3.

GEOLOGY AND SOILS — Soils

PM33 Giddings, R. None Stated

Comment:
I looked at a lot of construction sites, and these so-called curtains to keep soil from running off the property, didn't work. You go out there after a big rain and the soil will have filled up over there and be running down onto the neighbor's property.
Response:
A preliminary storm water pollution prevention plan has been developed by Tenaska, including soil erosion control measures to be used during construction. Soil erosion control plans will comply with local, state and federal regulations and must be approved by the appropriate agencies.

T19/40 Herman, O. Rebound

Comment:
There is no discussion in Deis of how these theorized mitigations (erosion & runoff) will be enforced at the construction and production job site nor is there discussion of efficiency of these purported methods or discussion of more efficient alternatives.

Response:
The purpose of the eis is to identify potential impacts and mitigation measures that could be enacted and not to discuss actual implementation, schedules and procedures for those measures. Mitigation measures to be implemented for the project, including practices to be implemented (i.e., types of erosion control material to be used, their location, installation, etc.) will be outlined in the Mitigation Action Plan prepared for this project in the Record of Decision. Soil erosion control will comply with local, state and Federal regulations.
Also see responses to comments T19/37 (Page) and PM33 (Page).

T19/41 — Comment:
Herman, O. — The eis must include a discussion regarding the potential for the deposition of solids as silt is washed from
Rebound — the project site into normally permeable soils due to erosion.
Response:
See responses to comments PM26 (Page) and PM33 (Page).

HYDROLOGY AND WATER QUALITY — Groundwater

PM26 — Comment:
Giddings, R. — I'm really concerned a lot about the groundwater, the aquifer underneath all of this.
None Stated — Response:
A hydrogeological assessment has been developed for the project and has been submitted to the Tacoma-Pierce County Health Department for review and approval. The hydrogeological assessment addresses the measures that the plant will incorporate to minimize potential contamination of the aquifer and yet allow the infiltration of uncontaminated storm water to the aquifer.

PM28, PM29, and PM35 — Comment:
Ms. Giddings expands on her concerns with groundwater issues and well water.
Giddings, R. — Response:
None Stated — The effect of the proposed project on groundwater wells is described in Volume I, Section 5.11.2, Water Supply, of the Final eis. Also see response to comment PM26 (Page).

T11/2 — Comment:
Schmauder, A. — This amount of water used will likely cause Tacoma to drill other wells to meet water requirements in the
Clover Creek — future. This may eventually deplete the aquifer.
Council — Response:
The project is included in the Draft Comprehensive Plan for Pierce County, June 1993. The Draft Comprehensive Plan states, "Finite groundwater and surface water resources exist to meet projected growth requirements for the next 20 years." (Page VIII-52).

T13/2 — Comment:
Evancho, J. — Page 4-6, 1st paragraph - statement is not correct. These public wells are under the authority of a number of
TPU — water purveyors.
Response:
The following text has been deleted (Section 4.3.1): "These public wells are under the authority of the City of Tacoma Public Utilities." It has been replaced in Volume I of the Feis, Section 4.3.1, with: "These public wells are under the authority of a number of water purveyors."

T13/6 — Comment:
Evancho, J. — Will a groundwater monitoring program be implemented, including adequate characterization of background
TPU — conditions, to identify any deterioration in groundwater quality which may result from the construction and/or operation of the facility?
Response:
See response to comment T13/7 (Page).

T13/7 — Comment:
Evancho, J. — The Tacoma Water Division will request that the Tacoma-Pierce County Health Dept. impose, under authority of
TPU — Pierce County Code Chapter 21.16, monitoring requirements and other appropriate mitigation measures necessary to protect groundwater quality.
Response:
A hydrogeological assessment has been submitted to Pierce County Health Department for review and approval as required by Pierce County Code, Chapter 21.16. Any additional mitigation measures above those identified in the assessment will be incorporated into the project to comply with Tacoma-Pierce County Health Department requirements.

T17/4 — Comment:
Harp, B. — This site is NOT underlain by Vashon Till, a protective layer for deep

groundwater sources.

Tacoma-Pierce Co. Health — Response:
Volume I, Section 4.2.1 has been revised accordingly.

T17/5
Harp, B.
Tacoma-Pierce Co. Health — Comment:
Most groundwater originating in this basin flows toward "the Narrows," a narrow water channel separating Tacoma from the Gig Harbor Peninsula, NOT toward Commencement Bay.

Response:
The following text has been deleted from Section 4.3.1: "The overall direction of groundwater movement in central Pierce County is to the north or northwest toward Commencement Bay in Puget Sound." Has been replaced in Volume I, Section 4.3.1, with: "Most groundwater flow originating in the Clover/Chambers Creek Basin flows northwest toward "The Narrows," a narrow water channel separating Tacoma from the Gig Harbor Peninsula (Figure S-1). Groundwater flow drains into the entire area of "The Narrows" via three stratified units. The most shallow unit is approximately 45 meters (150 feet) below ground level; this is still above sea level, and water drains into the ocean as "surface water." The second unit lies approximately 100 meters (350 feet) below ground level, and the third lies approximately 160 meters (550 feet) below ground level. The majority of groundwater flow enters the ocean below sea level."

T17/7
Harp, B.
Tacoma-Pierce Co. Health — Comment:
Groundwater quality in this area has been undergoing degradation.

Response:
The eis acknowledges this degradation. See Volume I, Section 4.3.1, Groundwater, Groundwater Contamination.
Also see responses to comments T22/7 (Page), T7/1 (Page), T22/10 (Page), and T19/34 (Page).

T17/9
Harp, B.
Tacoma-Pierce Co. Health — Comment:
The Tacoma-Pierce County Health Department requires submittal of a hydrogeological assessment, to determine the potential impact to groundwater resources, for every commercial facility proposed within the Aquifer Recharge Area boundary.

Response:
New paragraph has been added, starting with last sentence in Section 4.3.1, Clover-Chambers Creek Groundwater Management Program. Text now reads as follows: "The Tacoma-Pierce County Health Department is the lead agency responsible for the Groundwater Management Program. The County has adopted a "Critical Areas" designation which includes the area in and around the proposed project site. The area is designated as an "Aquifer Recharge Area" (Pierce County Code Chapter 21.16). The purpose of this designation is to prevent further degradation of groundwater quality through the control of land use activities. The Tacoma-Pierce County Health Department will require submittal of a hydrogeological assessment, to determine the potential impact to groundwater resources, for every commercial facility proposed within the Aquifer Recharge Area boundary."

A new paragraph has been added to Section 5.3.2, Impact HY2: "The Tacoma-Pierce County Health Department would require submittal of a hydrogeological assessment to determine the potential impact to groundwater resources (see Volume I, Section 4.3.1). Hydrogeological assessment has been submitted to Pierce County Health Department for review and approval. Any additional mitigation measures above those identified in the assessment will be incorporated into the project to comply with the requirements."

T17/10
Harp, B.
Tacoma-Pierce Co. Health — Comment:
What effect will particulates and other combustion by-products have on the surrounding groundwater recharge area?

Response:
No significant effect on groundwater quality would be expected. Under normal operation the proposed Tenaska Washington II project will burn natural gas. Consequently the waste gases from combustion will contain little or no particulate matter. Control measures for CO2 and NOX include the use of oxidation catalysts and selective catalytic reduction. During infrequent oil burning the plant will emit larger amounts of particulate matter. A discussion of the circumstances under which oil would be used as fuel is included in response to comment PM46

(Page). Particulate matter, when emitted, would be primarily carbon. Any fallout onto the ground surface would have no effect on groundwater quality. Particulates would be removed from percolating water as it passed through the soil layers.

The other primary combustion products are carbon monoxide and oxides of nitrogen. Carbon monoxide has no significance for water quality. Oxides of nitrogen react in the atmosphere to form nitric acid, which may reach the ground surface with precipitation. The chemical reaction in the atmosphere takes some time, so any nitric acid reaching the ground surface would be widely distributed in the area downwind of the site.

T17/12
Harp, B.
Tacoma-Pierce Co.
Health

Comment:
The Frederickson Area is extremely vulnerable to groundwater contamination.

Response:
Comment noted, and the eis supports this comment. See Volume I, Section 4.3.1, Groundwater Contamination.

T19/34
Herman, O.
Rebound

Comment:
Very large water demand may hasten the depletion and/or degrading of the aquifer.

Response:
The proposed power plant would use an average of 7.2 million liters (1.9 million gallons) per day of water. The Tacoma Public Utilities will be able to meet this water demand from its existing supplies. It is not expected that the proposed project would affect groundwater quality. Also see response to comment T11/2 (Page).

T19/36
Herman, O.
Rebound

Comment:
The underlying soils are extremely permeable, meaning any release of objectionable substances would be rapidly conveyed into the groundwater.

Response:
Text has been replaced in Volume I of the Feis, Section 5.3.2, Impact HY3, last sentence: "...and can block the pore spaces in the soil and result in reduced rates of infiltration." Has been replaced with "...which would be rapidly transported through the permeable soils without proper preventative measures described below." Also, see Section 4.3.1, Groundwater Contamination, which supports the comment that underlying soils are extremely permeable.

T22/5
Veit, K.
USEPA Region 10

Comment:
If a sole source aquifer designation is approved, EPA may review and comment on the project pursuant to Section 1424 (e) of the Safe Drinking Water Act.

Response:
Text has been added to Volume I, Section 4.3.1, Sole Source Aquifer Designation: "The Clover-Chambers Creek aquifer system was designated as a sole source aquifer on December 9, 1993."

T22/5B
Veit, K.
USEPA

Comment:
The Draft eis indicates on pages 4-7 and 4-8 that a petition for designation of the Clover-Chambers Creek Basin aquifer system (within which the proposed project site is located) as a Sole Source Aquifer has been submitted to EPA. The designation currently under review covers the larger area encompassing the Central Pierce County Aquifer System. We expect a final decision next month (November).

Response:
See response to comment T22/5 (Page).

T22/6
Veit, K.
USEPA Region 10

Comment:
Page 4-8 contains a factual error in the first paragraph. The July 1993 event was not a public hearing, but an informational meeting.

Response:
Text has been replaced in Volume I, Section 4.3.1, Sole Source Aquifer Designation, second-to-last sentence: "EPA took public comments...at a public hearing in July 1993." It has been replaced with "EPA took public comments...at an informational meeting."

T22/7
Veit, K.
USEPA Region 10

Comment:
The soils of the site are highly permeable...potential for groundwater contamination from infiltration of contaminants (during) construction and operation...impacts should be in the Final eis.

Response:
As noted in Section 5.3.2 of the Draft eis, wastewaters and chemicals at

the proposed project would be managed
to prevent groundwater contamination in this area of very permeable soils. The eis has been revised to include
more specific information on the wastewater management and spill prevention systems. Only unpolluted storm
water runoff would be allowed to percolate into the ground. Section 5.3.2, Impact HY3 addresses the effect of
proposed construction activities on groundwater quality. A hydrogeological assessment has been completed and
submitted to Tacoma/Pierce County Health Department. Copies are available upon request. Also see Volume I,
Section 5.9.2 in the eis, and response to comment T7/1 (Page).

T22/10
Veit, K.
USEPA Region 10

Comment:
All measures necessary to prevent potential adverse impacts to groundwater resources should be stated as
management commitments.
Response:
The eis describes the measures planned for the project to prevent groundwater contamination and includes further
suggested mitigation measures. The Record of Decision will contain or be accompanied by a Mitigation Action
Plan which will provide details of the mitigation measures to be implemented. Also see response to comment T7/1
(Page).

HYDROLOGY AND WATER QUALITY — Surface Water

PM32
Giddings, R.
None Stated

Comment:
These mitigation measures - it says here that the storm water runoff could be controlled.
Response:
See response to comment PM33 (Page).

T19/37
Herman, O.
Rebound

Comment:
The eis should contain greater detail regarding mitigation plans, rather than simply state that various actions
"could" be taken.
Response:
Some measures have been incorporated into the proposed project design to reduce potential environmental impacts.
These measures have become part of the project as proposed. If the project is approved, the project developer
will be committed to their implementation. Other mitigation measures, designed to reduce environmental impacts,
will be either conditions of permits and approvals by regulatory agencies, or specified by BPA in its Record of
Decision and Mitigation Action Plan.

T19/42
Herman, O.
Rebound

Comment:
The Deis does not describe the status of the project application for a storm water NPDES permit.
Response:
A Notice of Intent for Construction activity was submitted to the Washington Department of Ecology for a
baseline general permit to discharge storm water. According to Ecology, an NPDES permit will not be required
for operation of the proposed project. An NPDES permit will be obtained for construction. A preliminary storm
water pollution prevention plan has been developed by Tenaska.

T19/46
Herman, O.
Rebound

Comment:
The storm water would be channeled to a small area for discharge, there may not be an attenuation of
contaminants in the vadose zone.
Response:
Only unpolluted storm water would be routed to the biofiltration swale and infiltration pond. The system does
not rely on pollutant removal in the vadose zone to prevent groundwater contamination.

T19/47
Herman, O.
Rebound

Comment:
The Deis suggested that an impervious liner will be placed in the bioswale. This liner could not be totally
impervious; otherwise there would not be seepage from the swale into the groundwater at all.
Response:
The bioswale would be equipped with an impermeable liner to prevent premature percolation of storm water into
the ground. The objective of the design is to maximize contact between storm water runoff and the vegetative
elements of the bioswale. Concentrations of silt, nutrients or trace contaminants in the storm water would be
reduced in the bioswale before the storm water is routed to the infiltration system. The storm water runoff
directed to the bioswale and infiltration system would be primarily from open and parking areas.

T20/1

Comment:

Tenaska Washington Partner II, L.P.
Discussion on NPDES should be updated. Tenaska filed a Notice of Intent for coverage under Storm water Baseline General Permit with Washington Dept. of Ecology on 8/2/93. DOE determined operation of our facility will not require NPDES storm water permit.

Response:
Status of the NPDES permit has been updated in the Feis.

T22/8
Veit, K.
USEPA Region 10
Comment:
Type of information required to support the NPDES application including storm and process water flow schematics and control measures and best management practices should be reflected in the Final eis

Response:
See response to comment T19/42 (Page).

T24/7
Sheets, E.
Northwest Power Planning Council
Comment:
Chlorine and other biocides found in the plant cooling water may be released to the atmosphere in the form of cooling tower drift. Deposition of these chemicals in the area surrounding the plant may affect surface water and vegetation.

Response:
Trace amounts of chorine may be present in cooling tower drift. Concentrations would be comparable to the chlorine concentration of drinking water. Any other water conditioning chemicals in the cooling system would be at very low concentrations and are not expected to affect water quality or vegetation.

AIR QUALITY

PM42
Holbrook, N.
Greenhouse Action
Comment:
Despite all of this, plans by Northwest utility companies could increase carbon dioxide emissions 8 to 20 percent by the year 2013, by their concentration on natural gas turbines for electrical generation.

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

In order to minimize impacts of carbon dioxide emissions, BPA required sponsors of competitive resource proposals to develop means to relieve rate payers of the risks associated with carbon dioxide emissions. The Tenaska Washington II proposal goes further in reducing the risks than any other power plant we know of in this country. This is because natural gas emits less carbon dioxide per unit of energy provided than any other fossil fuel, and because the Tenaska Washington II proposal is highly efficient compared to other combustion systems. To the extent that it displaces operation of existing less efficient fossil-fueled power plants, in time it will help to reduce emissions of carbon dioxide.

PM46
Holbrook, N.
Greenhouse Action
Comment:
We believe that the extreme cold weather conditions under which the plant would burn oil could also bring periods of air quality emergencies.

Response:
Tenaska's natural gas purchase contract calls for firm supply; the power plant's gas supply will not be curtailed due to wintertime gas demand by other customers. Tenaska does not expect to burn fuel oil unless there is a failure of the natural gas fuel supply, or BPA requires an emergency restart when the plant is displaced and natural gas is temporarily unavailable. Air quality impact modeling has been conducted for all seasons and times of the day; thus, model results reflect worst-case

meteorological conditions.

PM59, T10/5 — Comment:
Giddings, W. — Looked at from the other side, this means that from half to nearly all of the plant's emissions would remain
Tahoma Audubon Society — unmitigated.
Response:
Efficient emissions controls and proposed mitigation measures will be utilized that will reduce emissions below regulated threshold levels.

PM67 — Comment:
Schipper, M. — And by adding a plant, we're just going to be increasing the amount of pollution that we're dealing with.
None Stated — Response:
Analyses in this eis conclude that no unmitigated significant air quality impacts will occur as a result of this project. Furthermore, the project will comply with all applicable air quality laws and regulations.

T12/2 — Comment:
Schmauder, A. — What will be the long term effect of releasing 6.8 million liters (1.8 million gallons) of water into the air?
Clover Creek Council — Response:
No significant impact is anticipated. Locally some additional fogging and precipitation (rain/drizzle) could occur. Under most conditions, the cooling tower moisture plume will rise well above ground level. Under cool, clear meteorological conditions the plume will be visible, similar to a cloud.

T18/2 — Comment:
Schullinger, S. — While it is true that CO2 content is less in natural gas than oil or coal, the amounts are still significant
Greenpeace — enough to be of concern.
Response:
Comment noted. BPA did not include carbon dioxide in the environmental costs used to rank resources in the RPeis resource stack because of the uncertain evidence supporting carbon dioxide impacts cost data. However, it was included in the analysis of the environmental effects of resource types. When BPA acquires resources, carbon dioxide emissions are considered in the non-cost portion of the evaluation.

T18/6B — Comment:
Schullinger, S. — Carbon sequestration does not sufficiently address the problem that our addiction to fossil fuel has created.
Greenpeace — Response:
Carbon sequestration is discussed in Section 5.4.2 of the eis under Impact AQ3.

T19/4 — Comment:
Herman, O. — Nitrogen oxides react with hydrocarbon pollution and sunlight to produce low-level ozone. This premise
Rebound — regarding NOX must be re-addressed in the eis.
Response:
See response to comment T27/1 (Page).

T19/7 — Comment:
Herman, O. — SO2 emissions from this project may also have a significant adverse impact on Mt. Rainier National Park and
Rebound — either exceed or approach the National Park Service's significance threshold.
Response:
SO2 impacts on Rainier were assessed and found to be well under PSD Class I increments and EPA Significant Impact Thresholds. See the eis Appendix G, Tables 7-4 and 7-2.

T19/8 — Comment:
Herman, O. — The eis must explain what pollutants make up the other 2 kilograms/hour (4.4 lbs/hour) of VOCs (... considering
Rebound — the TAPS account for less than 1 kilogram/hour [2.2 lbs/hour] of the 4 kilograms/hour [8.8 lbs/hour] total VOC emission).
Response:
Full specification of the VOC emissions is provided in Table 3-4 of Tenaska's air permit application to PSAPCA.

T19/16 — Comment:
Herman, O. — The eis should state the parameters and criteria upon which the models (ISCST2) were based, including dispersion
Rebound — during poor air quality and temperature inversion conditions.
Response:
Parameters and criteria for models are documented in Feis Appendix G, Section 6.1.1.

T19/18 — Comment:
Herman, O. — Cumulative impacts of this and other ammonia sources should be included in the eis...under adverse
Rebound — conditions...should also include 1-hour maximum impact.

Response:
This project's ammonia impacts have been found to be insignificant for worst-case stack emissions and worst-case meteorological conditions. Note that hourly meteorological data for all seasons for a 5-year period of record were used from McChord AFB in the dispersion model. As such, worst-case dispersion conditions have been included in the analysis reported in the Feis.

Section 5.4.2, Impact AQ1, and Table 5.4-6 have been revised to report modeled impact results for worst-case 1-hour project impacts: The modeled maximum 1-hour impact is 0.03 ppm (19 yg/m3), which is well below the odor threshold. Because impacts are well below odor thresholds and the Washington Department of Ecology ASIL (59.9 yg/m3 24-hour average for individual projects), and because there are no known significant sources of ammonia emissions nearby, cumulative impacts are expected to be insignificant.

Also see response to comment T22/2 (Page) re: cumulative impacts.

T19/19
Herman, O.
Rebound

Comment:
The Feis should correlate emissions, ambient concentrations and dispersion factors with an odor threshold (ammonia in the presence of NOX and CO).
Response:
Emissions and dispersion factors have been fully considered in the Feis impact analysis. Because no significant sources of ammonia are known to exist in the vicinity, existing levels are expected to be low. Also see response to comment T19/18 (Page). Furthermore, CO and NOX are not anticipated to influence ammonia impacts.

T19/20
Herman, O.
Rebound

Comment:
The Deis completely fails to address the conversion of ammonia emissions to the formation of NOX.
Response:
Tenaska proposes to use ammonia and SCR technology to control NOX emissions from the power plant. Ammonia does not convert appreciably to NOX in the atmosphere. It is not an ozone precursor, and there is reason to believe that it has the opposite effect of removing ozone precursors. Ammonia oxidizes very slowly in the atmosphere, and reaction pathways to NOX are not indicated in the literature. Highly water soluble, it is scavenged quickly by atmospheric water droplets. Furthermore, being one of the only basic gases in the atmosphere, it is very quick to react with acidic gases such as nitrogen oxides. Thus, it appears that ammonia has the effect of removing NOX ozone precursors from the atmosphere, rather than forming them as the commenter has suggested. (See: Atmospheric Chemistry, Finlace-Pitts and Pitts, John Wiley and Sons, NY, 1986 for further information on the atmospheric chemistry of ammonia.)

T19/60
Herman, O.
Rebound

Comment:
The eis should consider the installation of a water saving, air cooling system as an alternative to simply discharging steam into the open air through cooling towers.
Response:
The plant utilizes a condenser cooled by water from the cooling tower. Steam from the steam turbine is not discharged to the open air, but is condensed and returned to the boiler in a closed system.

An air cooled condenser significantly increases plant fuel use due to decreased efficiency of the power plant cycle and adds significant costs. Air cooled condensers can be used when there is no other alternative such as for arid or desert plant sites.

T22/2
Veit, K.
USEPA Region 10

Comment:
The Final eis should describe the cumulative air quality impacts of the proposed Tenaska project and the existing power plant in the vicinity of the project site.
Response:
The following explanation has been added to Section 5.4.1: To assess the potential for cumulative impacts, proposed new sources (i.e., not part of the baseline) in the region were reviewed with PSAPCA and Washington Dept. of Ecology; none have been permitted within the project's significant impact area. Unless permitted, proposed sources cannot be included as "real" in cumulative impacts. Thus, significant cumulative impacts are

not anticipated with this project. Existing sources, such as the "peaker" power plant nearby, are already included in the baseline that was used to assess project impacts. Thus, including the peaker in cumulative impacts would be to double-count its impacts.

T22/4 — USEPA Region 10

Comment:
An inconsistency appears in the Draft eis between page 5-10, and Table 5.4.2 in reference to the number of "hours" vs. "days" fuel oil would be utilized (should apparently be 120 hours).

Response:
Comment noted. The eis has been corrected to indicate 120 hours.

T24/11 — Sheets, E. — Northwest Power Planning Council

Comment:
Air pollutant emissions will be minimized using Best Available Control Technology (BACT). We understand the proposed nitrogen oxide control will be Lowest Achievable Emission Rate (LAER). The last paragraph on p. 3-4 should be modified to convey this.

Response:
The eis has been revised to indicate that: ". . .the proposed NOX control technology goes beyond current BACT requirements, and would satisfy more stringent LAER requirements that do not apply to this project."

T24/11B — Sheets, E. — Northwest Power Planning Council

Comment:
Equivalents of Tables 5.4-5 and 5.4-6 should be provided for firing on fuel oil.

Response:
This information is in Section 7.0 of Appendix G. The burning of fuel oil would be no more than 120 hours per year which is a very small percentage of the total fuel used on an annual basis.

T25/1 — Wilson, J. — LASER

Comment:
The ammonia emission rate of 10 ppm is really an additional emission of 10 ppm of NOX. Because the ammonia itself will not remain as ammonia, it will oxidize into oxides of Nitrogen. The actual NOX emission will be nearly tripled to 272 metric tons/year (300 tons/year).

Response:
Ammonia does not react to form NOX in the atmosphere. See response to comment T19/20 (Page).

T25/1B — Wilson, J. — LASER

Comment:
Therefore, the final eis should discuss alternative NOX control technologies such as low-NOX burners (the new ABB low NOX burners is reportedly controlling emissions to below 6 ppm NOX) or overwatering/steam injection to reduce NOX. These mechanisms will produce the same ultimate control of NOX, after taking into consideration ammonia/NOX conversion, without running the risk of transporting and storing and using ammonia.

Response:
Low-NOX combustors are available for gas turbines, as the commenter correctly points out. General Electric Company offers such combustors for its Frame 7 engines (proposed for use by Tenaska) that can give performance similar to ABB units as cited in the comment. These combustors significantly decrease NOX emissions, particularly at high turbine load conditions, but have the side effect of increasing carbon monoxide (CO) and unburned volatile organic compounds (VOC) emissions due to decreased combustion efficiency. Tenaska considered low-NOX combustor technology during conceptual design studies, but opted for the proven reliability of SCR when combined with combustor steam injection for NOX control. This proposed approach results in lower out-of-stack NOX emissions (3 ppm) from the plant than would be achievable with low-NOX combustors alone (6 ppm cited by the commentator). Also see response to related Comment 19/24.

To address this and other commentator's concerns about risks associated with transportation and storage of anhydrous ammonia, Tenaska has decided to use aqueous ammonia instead for the SCR. This will significantly reduce related health and safety risks. Also see responses to comments T19/17 (Page), T19/21 (Page), and T19/23 (Page).

T25/4 — Wilson, J. — LASER

Comment:
Attachment 3, sheet 4 lists 3.6 kilograms/hour (8 lbs/hour) about 27 metric tons/year (30 tons/year) of "sulfur mist" emissions. The Deis does not describe the impact of these emissions which may actually be sulfuric acid mist emissions.

Response:
The eis has been revised to add the following information: Sulfuric acid mist emissions of 4 kilograms/hour (9 lbs/hr) have been estimated by the turbine manufacturer while burning fuel oil. For emergency operation purposes, we have included up to 120 hours of back up fuel oil use per year; this equates to approximately .45 metric ton/year (0.5 ton/year) of emissions. This level is well below the EPA/Washington Department of Ecology PSD significant emission threshold of 6.35 metric tons/year (7 tons/year). Modeled maximum 24-hour impacts (worst-case dispersion assumed to occur the same time as fuel oil use) equal 0.43 yg/m3, which is well below the Washington ASIL of 3.3 yg/m3 for this compound. No existing or proposed nearby sources are known to significantly contribute to local impacts for this pollutant; thus, cumulative impacts are not an issue. This predicted amount of sulfuric acid mist emissions is not anticipated to contribute significantly to acid rain in the project region.

T25/6 — Comment:
Wilson, J. — Tenaska should not be allowed to burn construction debris including but not limited to cleared brush and trees.
LASER — This site is in a no-burn area.

Response:
See response to comment T19/13 (Page).

T27/1 — Comment:
Williams, J. — "Photochemical oxidants, mostly as ozone are the product of atmospheric reactions of such contaminants
LASER — (precursors) as hydrocarbons and nitrogen oxides in the presence of sunlight". We argue that NOX should be recognized as a ozone precursor in the Feis.

Response:
eis has been revised to add (in Table 5.4-3): PSAPCA has formally recognized NOX as an ozone precursor in its recently revised air regulations and attainment plans for this marginal non-attainment area for ozone. PSAPCA confirmed the project as a "minor" source of NOX in its proposed permit for the project.

AIR QUALITY — Existing Air Quality

PM1 — Comment:
King, J. — I just want to mention that there's obviously already an air quality problem developed in the area.
None Stated — Response:
The current air quality non-attainment situation is marginal, as designated by the state and EPA. Analyses conducted for this eis find no significant unmitigated impacts.

AIR QUALITY — Regulatory Requirements

PM39 — Comment:
Holbrook, N. — We are referring to natural gas - a fuel source that steers us toward ratepayers footing the bill for mitigation
Greenhouse Action — of yet another cheap fix for our energy needs.

Response:
See response to comment PM14 (Page).

PM40 — Comment:
Holbrook, N. — Impacts of carbon dioxide regulation and who will pay those costs, the developer or the ratepayer.
Greenhouse Action — Response:
If CO2 emissions become regulated in the future and there is a requirement for equipment modifications, then the developer will bear the costs. If there is a tax in the future, then BPA and the developer will renegotiate that issue.

PM44, T10/6 — Comment:
Holbrook, N. — We understand that Tenaska developers have been unable to obtain insurance against the risk of future CO2
Greenhouse Action — regulation. Does the insurance industry know something Bonneville does not?

Response:
Giddings, W. — Insurance could be purchased but not at a price expected to be cost-effective. Because the timing and costs of
Tahoma Audubon — any future CO2 regulations are unknown, the value of insurance for such cost risks is limited. See also
Society — response to comment PM40 (Page).

PM48 — Comment:
Holbrook, N. — And we believe CO2 mitigation costs are yet another cost that the ratepayers are at the risk of having to pay
Greenhouse Action — for.

Response:
See response to comment PM40 (Page). Also note that this project's developer is voluntarily mitigating

some of the potential effects of CO2.

PM66
Lane, S.
None Stated

Comment:
How do current air quality measurements compare with the Clean Air Act, and how is a gas-fired plant going to do anything but exacerbate the situation in this region that's currently not meeting up to standards?

Response:
See response to comment T10/5 (Page).

T9/11
Ordonez, R.
Pierce Co. Dept of Utilities

Comment:
The proposed project is within the Puget Sound Air Pollution Control Authority's urban area which has a burn ban and burning permits are under that agency's regulation.

Response:
See response to comment T19/13 (Page).

T10/3
Giddings, W.
Tahoma Audubon Society

Comment:
There is no reason to assume that national policy and international agreements will not include a carbon tax during the life of this project.

Response:
Comment noted.

T18/4
Schullinger, S.
Greenpeace

Comment:
You fail to recognize that increased industrial activity will certainly make it much more difficult for this area to come into compliance with stricter air quality regulations.

Response:
The area has formally been designated by Washington Dept. of Ecology and EPA as "marginal non-attainment," meaning that ambient air quality standards are exceeded by a small margin. The situation is not severe, but plans are being developed and implemented to bring the area back into attainment.

Discussions with Washington DOE during eis preparation indicate that the dominant source of air pollution leading to the current non-attainment status is mobile sources (cars, trucks, buses, etc.). PSAPCA's programs to reduce mobile source-related emissions of carbon monoxide and ozone precursors (VOC and NOX), together with its program requiring stringent emission controls on stationary sources and emission offsets from major stationary sources are expected by DOE to solve the marginal non-attainment situation.

The project includes very stringent emission controls to limit CO, NOX and VOC emissions and has been determined by PSAPCA to be in compliance with its attainment plan to improve air quality in the region.

T19/1
Herman, O.
Rebound

Comment:
Cumulative air quality impacts are not evaluated in this Deis. The potential for localized "hot spots" of high concentrations of criteria and/or toxic pollutants must be examined.

Response:
See response to comment T22/2 (Page).

T19/2
Herman, O.
Rebound

Comment:
The PSAPCA and PSD thresholds are not designed for the determination of significant impact on air quality for an eis.

Response:
These thresholds were developed by EPA, Washington Dept. of Ecology and PSAPCA to test the significance of impacts of individual new sources in non-attainment and attainment areas. BPA believes that this is an appropriate use of established significance criteria for this eis.

T19/5
Herman, O.
Rebound

Comment:
The Deis fails to provide background levels of CO in Table 6-2. Also fails to address how 100.5 metric tons/year (91.2 tons/year) will not contribute to the already illegal levels.

Response:
The eis text and tables have been revised to include CO monitoring results reported by Ecology (1991) measured in Tacoma, expected to overestimate existing conditions in the project vicinity: 19 yg/m3 1-hour maximum and 13 yg/m3 8-hour maximum (see Table 4.4-1). The region is not in attainment of the 8-hour ambient standard (10 yg/m3). The project's maximum CO impact under worst-case meteorological conditions has been found to be well below EPA/DOE significant impact thresholds for CO, as reported in Section 5.4.2. (See also Table 5.4-3 and Appendix G). Also see response to comment T19/2 (Page) for discussion of significance criteria.

T19/9 Comment:
Herman, O. The eis must address this project's contribution to the cumulative impacts and acknowledge that it will delay
Rebound the area's ability to attain compliance with PSAPCA's standards.
Response:
See responses to comments T22/2 (Page) and T18/4 (Page).

T19/13 Comment:
Herman, O. Project is located within the boundaries of PSAPCA's No-Burn Zone for residential and land-clearing fires in the
Rebound Puget Sound region. This should be discussed in the eis.
Response:
During construction of the project, Tenaska will comply with local and state regulations concerning any ban on
burning and land clearing fires.

T20/7 Comment:
Tenaska Washington Pg 5-10 Section 5.4.2 Para 3 & 4 - "Tenaska's air permit application was reviewed by PSAPCA & submitted for
Partner II, L.P. agency and public comment on August 11, 1993. No comments were received by PSAPCA" (Jay Willenburg, PSAPCA,
pers. comm., September 15, 1993).
Response:
This information has been added to Volume I, Section 5.4.1.

T22/1 Comment:
Veit, K. Pgs 5-15 & 5-16-Proposed Tenaska project is not subject to Prevention of Significant Deterioration (PSD) -not
USEPA Region 10 entirely correct. Because project is defined as "synthetic minor" and is subject to Federal enforceable permit
conditions, it will not be subject to PSD.
Response:
Comment has been noted and language in eis now reflects this clarification, in Volume I, Section 5.4.2,
Compliance with Ambient Standards.

T22/3 Comment:
Veit, K. The Final eis should reflect the latest emission limits and requirements of PSAPCA included in the air permit
USEPA Region 10 issued for the proposed project stated in terms of "potential" as opposed to annual averages.
Response:
Tables 5.4-1 and 5.4-2 reflect the emission rates currently stated in the air permit for the project issued by
PSAPCA. The title of Table 5.4-1 has been modified to clarify that maximum emissions are expressed as maximum
potential hourly emissions. The text has been modified to reflect that the stated emissions limits are those
set by PSAPCA in the air permit for the project.

AIR QUALITY Global Warming

PM8 Comment:
Abraham, C. Secondly, I wish to address the green-wash of natural gas which is not environmentally friendly like the
None Stated industry would like us to believe. Natural gas is roughly 80 to 95 percent methane.
Response:
BPA recognizes that all generating resources, including combustion of natural gas, produce adverse environmental
impacts. These impacts were studied and evaluated in BPA's RPeis, discussed above.

BPA attempts to address these concerns in the environmental costs assigned to all generating resource proposals
evaluated. Specific costs are assigned to the actual emissions of such pollutants as nitrogen oxides and
particulate matter. Because renewable resources typically do not emit these pollutants, environmental costs for
gas-fired power plants typically are higher than for renewables. However, even after accounting for higher
environmental costs, Tenaska Washington II remains cost-effective.

Tenaska Washington II will use the most advanced pollution control equipment available. Emissions of nitrogen
oxides will be reduced to their lowest achievable level. Methane emissions will be minimized to small amounts
from leakage in the system because most methane is combusted. Only trace amounts of particulate emissions will
be released because natural gas has no solid particles. Finally, hydrogen sulfide is removed from natural gas
prior to delivery to the pipeline. Pipeline grade natural gas is the cleanest burning of all fossil fuels; its
use is encouraged by the President in his Climate Change Action Plan to help reduce air pollutant emissions.
Also see response to comment T10/2 (Page).

PM9 Comment:

Abraham, C.
None Stated

Methane is a global warming gas; more than 60 times effective as CO2 at trapping heat in the atmosphere over a 20-year span.

Response:
See responses to comments T18/3 (Page) and PM8 (Page).

PM17
Lane, S.
None Stated

Comment:
The common misinformation provided by the natural gas industry is that of natural gas being a clean-burning fuel which is ridiculous considering that natural gas is 80 to 95 percent methane.

Response:
See response to comment PM8 (Page).

PM36
Giddings, R.
None Stated

Comment:
And of course, there's the global concerns.

Response:
Comment noted. Also see response to comment T10/2 (Page).

PM49
Holbrook, N.
Greenhouse Action

Comment:
I believe somewhere in one of the BPA reports, they said, "Natural gas is benign." I just don't understand that. There is, within the environmental community, even disagreement over pursuing fuel switching; this needs to be evaluated.

Response:
BPA was unable to verify the quoted statement. The comment appeared to be made in the context of CO2 mitigation; see responses to comments PM8 (Page) and T10/2 (Page)

PM57
Giddings, W.
Tahoma Audubon Society

Comment:
Among the strongest objections to increased reliance on fossil fuel combustion as an energy source, is the concern for carbon dioxide's contribution to potential global warming.

Response:
Comment noted. See responses to comments PM4 (Page), T18/6 (Page), and PM42 (Page).

PM58, PM60
Giddings, R.
None Stated

Comment:
The world's leading atmospheric scientists view global warming as the single greatest threat to the future of humanity and the environment, far more important than any of the air pollutants currently regulated.

Response:
BPA is also concerned about the potential impacts of global warming and considers this in its resource decisions. See response to comment T18/6 (Page).

PM63
Schipper, M.
None Stated

Comment:
What I'm talking about basically is the long-term costs of putting the carbon dioxide and the methane into the air.

Response:
BPA recognizes that all generating resources, including renewable resources, produce adverse environmental impacts. These impacts were studied and evaluated in BPA's RPeis. That document also addressed the environmental impacts associated with combustion of natural gas. Also see response to comment PM42 (Page).

T10/2
Giddings, W.
Tahoma Audubon Society

Comment:
Among the strongest objections to increased reliance on fossil fuel combustion as an energy source is the concern for carbon dioxide's contribution to potential global warming.

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

The President's plan also recognizes electrical transmission and distribution system losses as a target for reducing carbon dioxide emissions. Located near to existing and future users in the southern Puget Sound region, the Tenaska Washington II project would help to reduce electrical line losses by serving nearby users. To the extent that it displaces operation of existing power plants, it would help to reduce greenhouse gas emissions. Thus, the proposed project would be consistent with the

current National Climate Change Action Plan on several counts in its endeavors to reduce greenhouse gas emissions such as carbon dioxide.

BPA needs to add gas fired CTs as part of its future resource acquisition plans that include multiple resources. BPA would be unable to meet its forecasted deficits without acquiring additional energy supplies. By utilizing a variety of energy resources, BPA retains some flexibility in cost and environmental consequences. Natural gas is one of many resources BPA will consider. As a natural gas resource, the Tenaska Washington II plant produces less carbon dioxide per BTU than other fossil fuel sources, and is more efficient in its operations than most other power plants in the United States.

Also see response to comment PM42 (Page).

T10/4
Giddings, W.
Tahoma Audubon Society

Comment:
Our concern is the global environmental impact of increased carbon dioxide emissions.

Response:
See response to comment PM42 (Page).

T18/3
Schullinger, S.
Greenpeace

Comment:
Natural gas is also 80-95% pure methane, a greenhouse gas twenty times more potent than carbon dioxide over a 100-year span and 60 times more potent over a twenty year span.

Response:
Most of the methane will be burned in the combustion process and converted to CO2. See response to comment PM8 (Page).

T18/5
Schullinger, S.
Greenpeace

Comment:
I find it inconceivable that an issue as important and as vital to our common future as global warming should be given such short attention as was demonstrated in the Draft eis.

Response:
See response to comment PM42 (Page).

T18/6
Schullinger, S.
Greenpeace

Comment:
The Intergovernmental Panel on Climate Change has declared to stabilize atmospheric concentrations of man-made greenhouse gasses, a global cut in emissions of more than 60% is needed.

Response:
The Clinton/Gore 1993 Climate Change Action Plan calls for a return of U.S. greenhouse gas emissions to 1990 levels by year 2000 with cost effective domestic actions. One of the actions cited is to encourage the use of natural gas and discourage the use of oil or coal for energy production. BPA's energy acquisition portfolio includes conservation, wind, geothermal, hydro, and biomass resources, efficiency improvements, and gas fired combustion turbines, all of which will assist in achieving the emission goals of the Action Plan.

T18/16
Schullinger, S.
Greenpeace

Comment:
The Section on global warming should be broadened to include the recommendations made by the IPCC to reduce greenhouse gas emissions by 60 percent.

Response:
The eis acknowledges the potential effects of global warming in Section 4.4.4. See response to comment T18/6 (Page).

T19/38
Herman, O.
Rebound

Comment:
The Deis fails to discuss the possible contribution of this plant's massive steam discharges to global warming.

Response:
See responses to comments T10/2 (Page) and T18/6 (Page).

T19/39
Herman, O.
Rebound

Comment:
The eis should also state whether Tenaska plans to mitigate the emissions of other gasses which contribute to global warming, such as its criteria pollutants and its heated water vapor.

Response:
Other pollutants will be emitted in minor quantities compared to CO2. The facility's water vapor emission would have a negligible influence on atmospheric moisture and global climate.

T24/10
Sheets, E.
Northwest Power Planning Council

Comment:
The discussion of global warming should be augmented to convey more fully the nature of the issue, as a potential environmental impact.

Response:
Due to the uncertain scientific evidence concerning the effects of CO2, an extensive discussion of CO2, as related to global warming, is not warranted. Also see response to

comment PM42 (Page).
BIOLOGICAL RESOURCES
T24/6 Comment:
Sheets, E. Tenaska Washington II, is not likely to have a significant effect on resident or anadromous fish associated
Northwest Power changes in the operation of the hydro system. May change as additional gas-fired generation is integrated into
Planning Council the regional system.
Response:
BPA does not believe that the addition of the Tenaska Washington II plant to its system will have any effect on
resident or anadromous fish related changes in the operation of the hydrosystem. BPA recognizes that continued
additions of non-hydro resources to the system, in terms of matching resources with load, could result in an
adjustment to the timing and volume of flows. These changes might affect fisheries. BPA is currently
evaluating ways of operating the hydro system, and investigating the potential effects on resident and
anadromous fisheries in the Columbia River System Operations Review (SOR). The SOR process will determine the
operating requirements necessary to serve the multiple purposes of the Federal facilities, including power
generation, fisheries, recreation, irrigation, navigation, and flood control. The resulting decisions on the
operating requirements will apply to power operations for all BPA transactions.
BIOLOGICAL RESOURCES Vegetation
PM30 Comment:
Giddings, R. We did a core boring on an oak and came up with 120 years, - and they were telling me tonight that maybe we
None Stated could save some of these oaks by changing the shape of the berm that goes around the oil storage tank.
Response:
See response to comment T19/53 (Page).
T18/14 Comment:
Schullinger, S. When the gas companies cut the first roads in a virgin forest, they are often followed by logging companies.
Greenpeace Once these roads are in, it becomes economical and practical for clearcutting to commence. Ironically, while
the destruction of boreal forests that serves as a natural sink for the very pollutants that are emitted during
the drilling, processing, and combustion of natural gas is occurring, many companies consider "planting trees" a
worthy mitigation measure. What these misguided but doubtless well meaning corporations fail to realize is that
no plantation can ever take the place of a forest whose K must remain intact.
Response:
Comment noted. See response to comment T18/12 (Page).
T19/53 Comment:
Herman, O. The eis should describe the status of the Pierce Co. and WDW review of these oak stands, and list several
Rebound potential mitigations to be provided by the developer for the loss of these trees.
Response:
The plant plot plan incorporates the stand of the largest diameter oak trees into the landscaping. Small
seedling oaks will be transplanted on-site or made available to the Clover Creek Community Council for their
local stream bank restoration projects. Pierce County has been advised of the oak trees on the site.
BIOLOGICAL RESOURCES Floodplains/Wetlands
T17/8 Comment:
Harp, B. The wetland area bordering the south side of 192nd Street East is the surface of the local groundwater table.
Tacoma-Pierce Co. Fluctuation in the water table throughout this area have been documented to be as much as 15 feet during a one
Health (1) year period.
Response:
Construction and operation of the proposed project is not expected to affect the wetland area south of the site.
Water table fluctuations are typically 1.3 to 1.5 m (4.5 to 5 feet) during the year (Volume I, Section 4.3.1).
BIOLOGICAL RESOURCES Wildlife and Wildlife Habitat
PM31 Comment:
Giddings, R. I noticed some omissions in there that possibly could be on that property as far as birds and animals and so on.
None Stated They didn't mention the field mice when there's probably about five thousand million of them out there.
Response:

The list of species provided indicates those species or recognizable signs observed at the project site. A list of "potential" species or migrants would include several hundred species. The "field mice" R. Giddings refers to are actually voles, and are referenced in Volume I of the Feis, Section 4.5.3.

PM34 Comment:
Giddings, R. The wildlife dies when they cover up the ground. -- it gets killed out in the street where all the animals are
None Stated all migrating away from the property -- and it just dies because there's no place for it to go. The habitat is full.
Response:
See Section 5.5.2, Impact BR2 and Impact BR4, for the anticipated degree of these impacts.

T18/13 Comment:
Schullinger, S. Gas companies are completely fragmenting and destroying the majority of the grizzly bear's habitat by putting in
Greenpeace seismic lines and cutting roads into the wilderness (reference to oil & gas exploration in Canada).
Response:
Comment noted. See response to comment T18/12 (Page).

T20/8 Comment:
Tenaska Washington Pg 5-26 Impact BR4 - It should be noted that this impact applies to the gas line, water line and sewer line
Partner II, L.P. corridor also.
Response:
This information has been included in the eis text.

BIOLOGICAL RESOURCES Sensitive Species

T15/1 Comment:
Norwood, S. Table 4.5-1, page 4-19 - The state status given for Aster curtus is incorrect. Aster curtus is listed by the
Washington Dept. of state as sensitive.
Natural Resources Response:
The eis has been corrected to reflect that Aster curtus is listed as sensitive by the Washington Natural Heritage Program (1990).

T15/2 Comment:
Norwood, S. Page E-5, (re: white-top aster) has a statement that no evidence of Idaho fescue was observed at the project
Washington Dept. of site. Contradictory to this statement, Table E-1 on the following page lists Idaho fescue as one of the plants
Natural Resources observed at the Tenaska Site.
Response:
The eis has been corrected to indicate the presence of Idaho fescue.

T19/54 Comment:
Herman, O. The eis should also reference WDW's most recent endangered and threatened species list and state the presence of
Rebound any habitat that potentially will be impacted by this project proposal.
Response:
The following was added to the eis at the end of Section 4.5.4. "In addition to those sources listed above, a review of the Washington Department of Wildlife publication entitled "Management Recommendations for Washington's Priority Habitat and Species" was reviewed for potential sensitive habitat (i.e., habitat which is either sensitive and/or habitat which supports sensitive species) within the project site. No sensitive habitat was determined present for the project site. A review of sensitive species indicated that several species could be associated with habitat found within the project area. These species include the Columbia white-tailed deer (Odocoileus hemonius columbiannus), pileated woodpecker (Dryocopus pileatus), western bluebird (Silalia mexicana) and western gray squirrel (Sciurus griseus). Although the project site supports habitat for these species, it is unlikely that any of these species would rely on this area as prime habitat because of the disturbed nature of the surrounding area and because the amount of forested area is small and relatively isolated. The closest siting of any of the species listed above is that for the Western bluebird which has been sited roughly 3.2 km (2 miles) west of the project site; however, these species are nesting in artificial nest boxes and not in natural cavities. The project site does not support natural cavities. It is highly unlikely that any sensitive species use this area either for migration, nesting or as a prime feeding area and no sensitive habitats are located here."

LAND USE AND COMMUNITY CHARACTER

T20/3 Comment:

Tenaska Washington Partner II, L.P.
It should be noted that the Tenaska Washington II project is specifically included in the Draft Comprehensive Plan for Pierce County, June 1993.
Response:
This information has been included in Volume I, Section 4.6.1, Planning Background and Zoning Designations.

LAND USE AND COMMUNITY CHARACTER — Existing Land Uses

PM13
Abraham, C.
None Stated
Comment:
I do not want this natural gas plant anywhere near where I live.
Response:
Comment noted.

HISTORY AND ARCHAEOLOGY — Survey Results

T8/1
Whitlam, R.
Washington Dept. of Community
Comment:
We have reviewed the National and State Registers of Historic Places and the Washington State Archaeological and Historic Sites Inventories, and no resources are indicated in the identified project area.
Response:
This information has been included in Volume I, Section 4.7.6.

SOCIOECONOMICS AND PUBLIC SERVICES

PM22
Schipper, M.
None Stated
Comment:
I really question that this is the cheapest way to supply energy here in the Northwest.
Response:
In a competitive resource acquisition process, this project has demonstrated that it can help to meet electrical needs in the Northwest in the most environmentally and economically sound manner.

PM23
Schipper, M.
None Stated
Comment:
The fossil fuels industry in this country is subsidized with our tax money.
Response:
Comment noted.

PM61
Giddings, W.
Tahoma Audubon Society
Comment:
I submit that society cannot afford this project.
Response:
Comment noted.

PM62, T10/7
Giddings, W.
Tahoma Audubon Society
Comment:
It is the ratepayers who are at risk for the potential costs of addressing the risk of further dependence on fossil fuels to be assumed by humanity and the global environment as a whole.
Response:
BPA agrees that these risks are real and has examined them regarding the expected current and future cost of operating Tenaska Washington II compared to alternative sources of power. BPA's system consists of more than 7200 aMW of firm hydro energy, more than 700 aMW of firm nuclear energy, more than 300 aMW of firm conservation energy, and no natural gas energy yet in place. In this context, excessive dependence on the use of fossil fuels does not appear to be a significant risk.

PM64
Schipper, M.
None Stated
Comment:
And how can you figure cost without thinking about the global cost, the health care cost, and the cost of the future?
Response:
BPA recognizes that no power generation facility is environmentally benign. An exhaustive evaluation of environmental impacts and associated costs for different kinds of power generation facilities was completed for BPA's Resource Program eis.

T18/7
Schullinger, S.
Greenpeace
Comment:
While the eis would have us believe that the proposed project will have a beneficial impact on the local community (in terms of employment), this impact would obviously be minimal at best.
Response:
Anticipated impacts of the proposed project on local employment are addressed in Section 5.8.2. Approximately 23 to 24 permanent operating staff would be expected to be hired from the existing local workforce, resulting in a net positive effect on local employment conditions.

T19/33
Herman, O.
Rebound
Comment:
The eis must explain these costs (hookup of the proposed facility to the County sewer system), the needed infrastructure improvements, and the possible impacts on other rate payers.
Response:
See response to comment T19/27 (Page).

T19/56
Comment:

Herman, O. The eis should consider: housing for temporary workers, the ability of communities to provide services, source
Rebound of the workforce (local vs. out of state), workers' pay and benefits, and the impacts to the state and local
community.
Response:
With the exception of workers' pay and benefits, which are outside the scope of this eis, these concerns are
addressed in Section 5.8.2 of the Feis.

T24/12 Comment:
Sheets, E. Section S.6.2 states there is no evidence in the eis to suggest that the proposed project is controversial.
Northwest Power Impact of the plant on the Columbia River Fish and Wildlife, global warming risks, effects of fuel oil and
Planning Council ground vibration should be included.
Response:
The Feis analyzes all known environmental impacts potentially associated with the proposed project.

SOCIOECONOMICS AND PUBLIC SERVICES Employment

PM68 Comment:
Holbrook, N. Do we want a project taking up that much airshed providing what I would consider to be a handful of jobs?
Greenhouse Action Response:
Comment noted.

T18/8 Comment:
Schullinger, S. Renewable resources can employ up to 5 times the number of people as can fossil fuels for every unit of
Greenpeace electricity generated.
Response:
The Tenaska Washington II Project best met BPA's selection criteria for environment, viability, and system cost
in the competitive bidding process.

T19/58 Comment:
Herman, O. The eis should address whether or not workers who have been trained through Washington State approved
Rebound apprenticeship programs will be employed in the construction of this project.
Response:
Construction workers will be trained by the contractors in safety and work practices. This training may include
apprenticeship programs.

T23/3 Comment:
Mork, E. Proposed construction schedule will generate 225 - 250 jobs over 18 mo. period. Permanent jobs in operating
EDB Pierce Co. plant are also of highly skilled variety with relatively good salaries. Operation will provide high quality
jobs - capable of supporting families.
Response:
Comment noted.

SOCIOECONOMICS AND PUBLIC SERVICES Tax Revenues

PM21 Comment:
Lane, S. Wind, geothermal and solar energy, are currently economically viable if not forced to compete with an industry
None Stated that is subsidized with our tax dollars to keep the price of fossil fuel artificially low.
Response:
Renewable resources such as wind, geothermal, and solar are included in BPA's resource planning. BPA is
actively pursuing cost-effective and environmentally sound renewable resources.

T20/9 Comment:
Tenaska Washington Pg 5-32 Para Impact SE2 - It should be noted that the $1 million for property taxes and $1 million for a state
Partner II, L.P. gas use tax are ANNUAL amounts.
Response:
The text of Impact SE2 in Section 5.8.2 has been modified to note that the estimated taxes would be annual
amounts, as follows: "Tenaska has estimated annual taxes for the proposed project at approximately..."

SOCIOECONOMICS AND PUBLIC SERVICES Fire Protection

T7/4 Comment:
Wienholz, W. The large fire flow requirement, provisions of foam fire protection and need to handle ammonia as a flammable
Pierce Co. Fire gas are not clearly identified in the Code.
Prevention Bureau Response:
See responses to comments T7/3 (Page) and T7/5 (Page).

T7/5 Comment:
Wienholz, W. We feel that it is important to establish these needs (fire flow requirement, foam fire protection and ammonia
Pierce Co. Fire handling) for mitigation of fire protection/health and safety impacts.
Prevention Bureau Response:

The fire protection system for the generation facility will be designed in conformance with National Fire Protection Association (NFPA) 850, Recommended Practice for Fire Protection for Electric Generating Plants and Uniform Fire Code. The system's design will be reviewed with the local fire department to ensure conformance with applicable codes and standards. All equipment installed in the plant for fire protection will be compatible with the local fire department's firefighting equipment. The fire protection system will include a fire water loop and monitors, CO2 fire extinguishing systems for the gas turbine, fuel oil tank foam system, sprinkler systems for various areas of the plant, and portable fire extinguishers.

A fire water system will be provided to protect plant facilities against fire. The fire water system will be supplied from the Tacoma Public Utilities water system. The system will include a fire water supply loop, fire hydrants, fire monitors, and hoses located at appropriate locations. Hose connections at hydrants will be compatible with the local fire department's firefighting equipment. Fire hoses will be sized for two-man operation.

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

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

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

All plant personnel will undergo scheduled in-house basic firefighting training to prepare them for emergency firefighting duties. In case of fire or an emergency, the shift foreman will be responsible for organizing the fire brigade and for notifying the appropriate authorities. The plant will be equipped to handle minor personnel injuries by providing a first-aid station and safety shower-eye wash stations in strategic locations in the plant. Major personnel injuries or emergencies will be handled by a hospital at Tacoma using outside ambulance services to transport patients.

T19/27
Herman, O.
Rebound

Comment:
The eis should analyze in detail the environmental impacts of this and other utility construction work, and outline the costs, the scope of work required, the sources of funding, and the impact to rate payers.

Response:
Section 4.11 describes the proximate locations of water supply and sewer facilities to the proposed project site. Environmental impacts of utility construction work would be minimal as work would be performed in an existing industrial area. Volume I, Section 5.11.2, of the Feis notes that there is agreement between Tacoma Public Utilities and Tenaska on the supply of water and funding from Tenaska. No impacts to ratepayers are anticipated because costs of utility construction work, etc. is included in the purchase price for the resources.

T26/1
Eustace, J.
U.A. Local No. 82

Comment:
Did not see any discussion in the Deis regarding the fire controls through the use of appropriate sprinkler systems...considering the use and storage of large amounts of natural gas, fuel oil, ammonia, and other toxic materials at the power plant site.

Response:
See response to comment T7/5 (Page).

T26/2

Comment:

Eustace, J. U.A. Local No. 82

We understand that a fuel oil fire at a O'Brien Energy Power Plant back east killed two workers. This illustrates the need to plan and discuss fire prevention measures such as sprinklers.

Response:
See response to comment T7/5 (Page).

PUBLIC HeaLTH AND SAFETY

PM19
Lane, S.
None Stated

Comment:
The community based around the proposed plant site should not be made to pay for the few jobs provided with their health and their children's health.

Response:
Comment noted.

PM24
Schipper, M.
None Stated

Comment:
There will be accidents. It might not be right here. But if we're building more gas plants, there will be accidents, there will be health care costs.

Response:
Accidents associated with gas-fired generation plants are not considered to be more likely than accidents associated with other fossil-fuel burning facilities. Considering the project will be new and will be required to meet all current health and safety regulations, accidents would be prevented to the maximum extent possible.

PM51
Iverson, E.
None Stated

Comment:
Mr. Iverson expressed deep concerns about the dangers and health and safety issues related to natural gas.

Response:
The Department of Transportation oversees the natural gas pipeline industry and has developed regulations to assure safety in the design, construction, testing, operation, and maintenance of those facilities. The DOT monitors compliance through inspection plans and enforcement actions. The major cause of pipeline accidents is outside force damage from construction or excavation equipment.

In the unlikely event of an accident, if significant quantities of gas are released into the atmosphere from a rupture of a pipe wall, the gas will burn if ignited and can explode in a confined space. Like other forms of energy, natural gas can be dangerous if not handled properly. However, because natural gas is considerably lighter than air, it will rise and tends to disperse rapidly. Consequently, natural gas would not form a cloud.

In fact, natural gas is routinely and safely vented to atmosphere under carefully controlled conditions to allow routine maintenance of pipelines.

T7/1
Wienholz, W.
Pierce Co. Fire Prevention Bureau

Comment:
Our greatest concern is with Impact HS3: "Hazardous substances used or generated during power plant operations could be spilled and released to the environment."

Response:
As noted in the Mitigation Measures for this Impact, a Spill Prevention Containment and Countermeasures Plan will be developed for the project. The Plan will be developed in accordance with local, state and federal requirements and guidelines and will be submitted to the appropriate agencies for review and approval.

T7/2
Wienholz, W.
Pierce Co. Fire Prevention Bureau

Comment:
The large fuel oil storage tank presents the potential for a serious fire problem requiring large quantities of water for an extended period.

Response:
Tacoma Public Utilities (TPU), as part of the Certificate of Water Availability Includes fire water service.

The design of the final fire protection system will comply with Pierce County Fire Prevention Bureau regulations and requirements and within the constraints of water availability from TPU.

T7/3
Wienholz, W.
Pierce Co. Fire Prevention Bureau

Comment:
The storage handling and use of other hazardous materials such as ammonia will ignite and burn, it will be handled as both a corrosive and a flammable gas.

Response:
The storage, handling and use of hazardous materials will be reviewed with the Pierce County Fire Prevention Bureau and other appropriate agencies. Aqueous ammonia will be used for the project.

T9/5
Ordonez, R.

Comment:
Hazardous substances used or generated during power plant operations could be spilled and released to the

Pierce Co. Dept of Utilities
environment.
Response:
See responses to comments T24/1 (Page) and T7/1 (Page).

T13/5
Evancho, J.
TPU
Comment:
Page 3-7, On-Site Fuel Storage - Given the highly permeable nature of the soils at this site, we would suggest the Department of Ecology Guidelines for spill containment be followed (encl) which calls for concrete diking or impervious containment dike.
Response:
See response to comment T17/1 (Page).

T17/1
Harp, B.
Tacoma-Pierce Co. Health
Comment:
The secondary containment structures for the fuel oil storage tanks (35,000 barrels) should be designed to contain a "worst case" spill.
Response:
The secondary containment structures are designed to contain a worst-case spill, which constitutes an entire spill or failure of the fuel storage tank. Such a spill would be contained within a bermed area, sized to contain the full content of the fuel oil tank plus one foot freeboard. An impervious lining will be placed within the diked areas to prevent fuel from entering the soil. Normally, the diked area would drain clean storm water runoff into the storm water bioswale. If an oil contamination occurs, a valve will redirect the runoff from this area into the oil/water separator.

T17/3
Harp, B.
Tacoma-Pierce Co. Health
Comment:
Containment or monitoring features should be included to determine leakage by the fuel tank piping system.
Response:
The fuel oil piping within the containment berm will be above ground. Piping from the berm to the plant will be located in a concrete lined trench with removable covers. The piping system will be visually monitored for leaks.

T17/11
Harp, B.
Tacoma-Pierce Co. Health
Comment:
A hazardous Materials Handling Plan and Spill Prevention Control and Counter Measure Plan should be submitted for review to this Department and approved by the appropriate agencies prior to final building approval or occupancy.
Response:
See response to comment T7/1 (Page).

T18/12
Schullinger, S.
Greenpeace
Comment:
If a blowout should occur at any of the wells (natural gas wells in Canada containing H2S), the effect on a densely populated area would be deadly.
Response:
Comment noted. The Canadian Federal and Provincial environmental laws and regulations apply to gas exploration and mining in Canada.

T18/15
Schullinger, S.
Greenpeace
Comment:
Recommendations for the Final eis: 1) Cumulative impacts be broadened to include the upstream effects of processing, transportation and exploratory drilling of natural gas; 2) The above impacts be considered and studied before making the final assessment on the Tenaska II Washington Generation Project.
Response:
It is considered inappropriate to adopt these recommendations pursuant to Executive Order No. 12114 regarding the extraterritorial application of NEPA, and DOE's guidelines for implementation of this order. 46 Fed. Reg. 1007-1010 (1981). Also see response to comment T18/12 (Page).

T19/3
Herman, O.
Rebound
Comment:
Any contribution to already unhealthy air pollution levels should be characterized as significant, especially on projects where large tonnages of additional pollutants are involved.
Response:
BPA finds that the project will not cause significant impacts and that the project is consistent with PSAPCA plans to improve regional/local air quality. See responses to comments T19/2 (Page) and T18/4 (Page).

T19/6
Herman, O.
Rebound
Comment:
No discussion is contained in the Deis regarding mobile sources (construction equipment, trucks, etc.) on the aggregate pollution contribution of this project.
Response:
The Feis has been revised to reflect the following: Vehicular/equipment engine exhaust emissions will be minor

and temporary during construction. Air quality impacts will be temporary during construction. The project will not generate significant vehicle trips compared to the existing traffic levels in the area. Vehicular and equipment exhaust emissions during project operations will, thus, have a minor incremental/cumulative impact locally and regionally.

T19/10 Herman, O. Rebound
Comment: It appears from these studies that ANY increase in PM-10 and TSP levels will cause an adverse health impact. This is a significant impact that should have been discussed in the eis.
Response: Deis findings show insignificant impact with respect to air quality standards and significance thresholds. These standards and thresholds were developed to protect public heath. Also see responses to comments T19/2 (Page) and T18/4 (Page).

T19/11 Herman, O. Rebound
Comment: The Deis fails to model 1-hr maximum concentrations of PM-10. We suggest 1-hr concentrations be modeled because of the serious implication of increasing already elevated PM-10 levels, as shown by these recent studies.
Response: Modeled 24-hour and annual impacts demonstrate compliance with all applicable ambient standards and demonstrate impacts below significance thresholds. Modeling of 1-hour impacts would serve no further purpose.

T19/12 Herman, O. Rebound
Comment: Other sources of PM-10 and TSP from this project which should be discussed in the eis: 1) construction, 2) construction traffic, 3) cooling towers.
Response: Construction activity and traffic would have temporary localized impacts from onsite dust generation. Proposed mitigation measures to control dust generation are discussed in response to comment T19/57 (Page). The dust will be primarily natural soil materials and is not anticipated to result in significant long-term impacts.
The proposed cooling towers would have the potential to emit up to 5 pounds per hour of dissolved solids (minerals) in water mist, based on conservative estimates of mist emissions and dissolved solids content by Tenaska and its equipment vendors. Tenaska has committed to install "mist eliminators" to reduce the amount of mist emissions to the air. To the extent that mist droplets remain suspended in the air in dry weather, some of the mist will dry to small solid particulate matter. However, such particulate matter is not expected to have a significant air quality impact. Cooling towers are not considered to be significant sources of particulate matter by PSAPCA and the Development of Ecology for air quality permitting.

T19/15 Herman, O. Rebound
Comment: eis fails to provide information regarding amounts (of ammonia release).
Response: Ammonia emissions (13.6 kilograms/hour [30 lbs/hour] from the SCR "ammonia slip") has been added to Table 5.4-5.

T19/17 Herman, O. Rebound
Comment: The eis should contain an analysis of a worst case controlled spill (ammonia).
Response: In order to reduce the potential risk to public health related to the project, Tenaska has decided to use aqueous ammonia, instead of anhydrous, for input to the proposed air pollution control equipment (NOX SCR). Aqueous ammonia remains a liquid when spilled/released; it can be contained and removed by normal spill prevention and response procedures, and does not release significant amounts of gaseous ammonia into the atmosphere, compared to the anhydrous form. Tenaska and its suppliers will comply with all applicable engineering and operational safety requirements. Thus, transportation, transfer, storage and use of aqueous ammonia is not expected to pose a significant health risk.

T19/21 Herman, O. Rebound
Comment: The Deis omits any consideration of the possible consequences of transporting, piping, storing and emitting hundreds of thousands of pounds of ammonia at this facility each year.
Response: See response to comment T19/17 (Page).

T19/22
Comment:

Herman, O. Rebound
The Deis does not compute the likelihood of a truck accident (involving ammonia).

Response:
The calculation of potential accidents associated with hauling ammonia is not within the scope of this eis. The trucking companies must comply with applicable regulations. The project will use aqueous ammonia, thus minimizing any hazards in the event of an accident.

T19/23
Herman, O. Rebound
Comment:
The eis for this project should discuss the use of ammonia in its aqueous form, rather than anhydrous ammonia.

Response:
See response to comment T19/17 (Page).

T19/24
Herman, O. Rebound
Comment:
The Deis fails to discuss a possible alternative project configuration that would include a NOX control system that does not use ammonia.

Response:
Tenaska has considered and adopted the use of aqueous ammonia as an alternative to anhydrous ammonia. Selective Catalytic Reduction (SCR) has been found to be an efficient, reliable, and environmentally acceptable method of controlling NOX emissions from combined-cycle gas turbine power plants at numerous locations in the US and other countries. Earlier in its preliminary design evaluations, Tenaska considered other methods of NOX control, including alternative gas turbine combustor designs, but found that these technologies did not achieve the same high level of NOX control as their proposed approach. BPA finds that Tenaska's review of alternatives and selection of SCR is sufficient for this eis. See response to comment T19/17 (Page).

T19/35
Herman, O. Rebound
Comment:
The eis must fully discuss this concern regarding the area's present and future water supply (concerning contamination by pollutants).

Response:
Tacoma Public Utilities is responsible for water supply planning. Wastewaters from the proposed project will be conveyed to the Pierce County sewage treatment plant. Only unpolluted surface water runoff will be allowed to percolate into the groundwater.

T19/43
Herman, O. Rebound
Comment:
This configuration of storm water management has several negative implications which are not discussed in the Deis: fuel oil storage area is connected to an infiltration system.

Response:
This fuel storage area drains to a sump equipped with a shut-off valve which is normally closed. After a storm water in the sump would be checked for presence of oil. If uncontaminated, the water will be routed to the infiltration system. Otherwise, it is routed to the oil/water separator and the Pierce County sewer.

T19/44
Herman, O. Rebound
Comment:
The Deis does not contain an adequate discussion regarding treatment systems for oil and grease from this site.

Response:
The plant will incorporate a system of oil/water separators to collect wastewater for the removal of oil and grease prior to any discharge. See the revisions to Impact HY2, Section 5.3.2 in eis, for a more detailed description of the wastewater treatment system.

T19/45
Herman, O. Rebound
Comment:
There is no mention of special runoff handling considerations for areas containing toxic materials, such as ammonia.

Response:
The plant will incorporate a chemical collection sump and neutralization tank for the collection, handling and neutralization of wastewater from chemical storage and containment areas. See the revisions to Impact HY2, Volume I, Section 5.3.2 in Feis, for a more detailed description of the wastewater treatment system.

T19/51
Herman, O. Rebound
Comment:
The eis must identify and describe the use of appropriate chemical treatment of its cooling tower system to stifle development of the relevant bacteria (concern about Legionnaires Disease).

Response:
The following practices recommended by Betz Industrial would be followed at the Tenaska Washington II Generation

Project: "Betz Laboratories has carefully followed industrial, institutional, and governmental activity associated with the control and eradication of Legionnaire's Disease Bacterium. Although cooling towers have not been linked positively to the transmission of the disease, it seems prudent to minimize the growth and development of this organism and the accretion of other species of microorganisms in recirculating water cooling towers, evaporative condensers and in other water systems. The body of data generated to date suggests the following recommended practices for the operation of a cooling system:

1) Maintain conventional slime and algae control in accordance with standard, effective water treatment practices. Maintain overall system cleanliness.
2) Thoroughly clean and flush the entire cooling water loop on a regular basis. Include a halogen disinfection before and after cleaning.
3) Consider regular elevated halogenation at extended contact times. A minimum of 1.5 yg/1 HOBr or HOCI should be maintained for 24 to 48 hours.
4) Since diverse physical, chemical and biological conditions that may exist in operating cooling water systems can affect bactericidal action, it is recommended that the cooling water system be analyzed for the presence of L. pneumophila prior to and after treatment.
5) Maintain best available mist elimination technology in the cooling tower proper."

T19/52
Herman, O.
Rebound

Comment:
Greater description of the composition and effects of this chemical (DCL 500) is needed in the eis, including a reproduction of the MSDS for DCL 500.
Response:
A description of DCL 500 is provided in Section 5.9.2 in the eis. Since DCL 500 is a stable, inert synthetic insulating liquid used in underground electric transmission lines, the MSDS does not list any adverse health risks under normal conditions/use. A copy of the MSDS is included in Appendix G in the Feis.

T19/57
Herman, O.
Rebound

Comment:
The eis should address this project's implementation of best available control technology and construction techniques in order to assure public health and safety and the mitigation of environmental impacts.
Response:
Text has been added to Section 5.4.2, Impact AQ1, explaining: The emission controls proposed for the power generation facility meet or exceed current BACT. The high-efficiency selective catalytic reduction unit proposed to control nitrogen oxide emissions to 3 ppm is more efficient than devices recently determined to be BACT for similar sources in Washington and it achieves control levels specified in very stringent LAER (lowest achievable emission rate) determinations in other states. Furthermore, the oxidation catalyst proposed to control CO emissions will also reduce VOC emissions. It satisfies BACT requirements, as determined by PSAPCA.

Section 2.3.5 of Tenaska's air quality permit application to PSAPCA describes emission controls proposed for the power plant. Tenaska will also comply with any PSAPCA requirements for watering to control dust at the site during construction. In general, the construction contractor(s) will be required to water site roads and active construction areas whenever dry soil conditions and construction vehicle/equipment activity lead to significant visible dust emissions. In addition, access roads and parking areas will be graveled to further aid in reducing dust emissions during construction. During plant operations, main roads and parking areas on the property will be paved.

T20/5
Tenaska Washington Partner II, L.P.

Comment:
Pg 5-6 Sect. 5.3.2 fuel oil storage area will be lined with impervious material & bermed. Precipitation from this area will be checked for oil content & either routed to oil-water separator, if necessary, or to the bioswale & infiltration pond for disposal.
Response:
The clarification has been added to Section 5.3.2, Impact HY1.

T22/9

Comment:

Veit, K.
USEPA Region 10

Construction and operational-phase measures to prevent and clean up spills of petroleum products and chemicals should be better documented and stated as commitments in the Final eis.

Response:

See responses to comments PM33 (Page), T19/45 (Page), T22/7 (Page), T13/7 (Page), and T19/37 (Page).

T24/1
Sheets, E.
Northwest Power Planning Council

Comment:

The project in operation will employ potentially hazardous materials; on-site handling and disposition of these materials will introduce possibly significant environmental risks to the site and surrounding region.

Response:

Each of the potentially hazardous liquid materials that will be used at the proposed project will be located within structures designed to contain the full capacity of the tank, plus 6 inches to one foot of freeboard.

Process equipment areas will be surfaced and curbed, with drains directed to a sump. Sump pumps will be provided to deliver water collected in the sump to either a neutralization tank or an oil/water separator. Oil removed from the water in the separator will be collected and disposed of by a qualified contractor. Water from the oil/water separator will be collected in a plant sump. Water from the plant sump will be combined with cooling tower blowdown and sent to the Pierce County sanitary sewer system. Water from the neutralization tank will discharge to the cooling tower basin. An SPCC plan will be prepared and submitted for approval. Chemicals used in the operation of the plant will be procured from commercial sources. These vendors will provide, or will contract, for transportation of these chemicals from the supplier's facility to the plant. The vendor or contracted carriers are licensed and regulated by state agencies, and are liable for the safe and proper handling and transport of these materials. Their responsibilities end with the delivery and off-load of these chemicals at the plant site into properly permitted on-site storage facilities. Also see response to comment T7/1 (Page).

T24/2
Sheets, E.
Northwest Power Planning Council

Comment:

Serious groundwater and stream contamination could result from improper or accidental release of these materials.

Response:

Wastewaters from the proposed project will be conveyed to the Pierce County sewage treatment plant. Only unpolluted surface water runoff will be allowed to percolate into the groundwater.

T24/3
Sheets, E.
Northwest Power Planning Council

Comment:

Element of the affected environment (soils, groundwater, surface waters, habitat, traffic and transportation) that could impact or be impacted by hazardous material releases should be described in Section 4.

Response:

An analysis of potential impacts to the affected environment due to release of hazardous substances is provided in Section 5.9 of the Feis.

T24/4
Sheets, E.
Northwest Power Planning Council

Comment:

The scope of the analysis should be expanded to include possible soil, groundwater and surface water contamination and biological impacts.

Response:

An analysis of the potential for hazardous substances to be released into the environment is provided in Section 5.9 of the eis. Potential impacts and suggested mitigation measures regarding soil, groundwater and surface water contamination by the release of hazardous substances that would be used during construction are outlined in Section 5.9.2. Also discussed are the anticipated methods for storage of hazardous substances associated with plant operations. Materials would be contained in a bermed area if there is a release, precluding impacts to soil, groundwater or surface water. Additionally, Section 5.3.2 discusses potential discharge of water pollutants. The text has been modified in order to clarify the off-site transport and handling of hazardous substances in conformance with the standards outlined in the Federal Resource Conservation and Recovery Act (RCRA).

T25/2
Comment:

Wilson, J. If ammonia is ultimately used, the plant should consider aqueous ammonia, rather than anhydrous ammonia, to
LASER reduce the risks from a release.
Response:
Aqueous ammonia will be used for the project. The Feis has been changed to reflect the use of aqueous ammonia.
T25/3 Comment:
Wilson, J. The Deis fails to provide a risk assessment of the effects of a large release of natural gas, fuel oil, acid,
LASER caustics, and ammonia. All these substances will be stored in large amounts at this site.
Response:
See responses to comments T19/45 (Page), T7/3 (Page), T7/1 (Page), and T24/1 (Page).
PUBLIC HeaLTH AND SAFETY Phase I Environmental Site Assessment
T19/48 Comment:
Herman, O. The eis must provide results of tests conducted on soil and groundwater samples, as well as detailed results of
Rebound the groundwater monitoring wells adjacent to this site.
Response:
Former land use and current conditions at the site do not warrant concern for potential soil or groundwater
contamination. Therefore, soil and groundwater sampling will not be conducted. For a more complete description
of the groundwater monitoring results, see the report prepared by ENSR Consulting and Engineering for Tenaska,
Phase 1 Site Assessment (ENSR 1993), and the Dames and Moore geotechnical reports (1980 and 1993).
TRAFFIC AND TRANSPORTATION
T19/55 Comment:
Herman, O. The eis must discuss the proposed project's contribution and impact on these already intolerable levels (of
Rebound traffic), both during construction and operation phases.
Response:
All potential significant impacts are discussed in this eis.
TRAFFIC AND TRANSPORTATION Growth Trends
T20/10 Comment:
Tenaska Washington Pg 5-45 Para Impacts - It should be noted that the plant will operate near capacity whenever it is running &
Partner II, L.P. that the output is not dependent upon the manpower on site.
Response:
Volume I, Section 5.10.3, Impact T2, has been modified as follows: "However, because the proposed power plant
would run on a 24-hour schedule, several shifts would be established for power plant operation." The following
has been deleted: "...because different amounts of power would be produced at different times of the day...".
It should be noted that the plant will operate near capacity whenever it is running and that the output is not
dependent upon the manpower at the site.
ENERGY AND UTILITIES
PM15 Comment:
Lane, S. The fact remains that fossil fuel is a finite resource, and dependence on such forms of energy dictates that we
None Stated will also remain dependent on foreign imports.
Response:
BPA and other northwest utilities have a long history of power purchase agreements, exchanges, and other
transactions with Canada. In all cases, contractual terms, international law, and treaty provisions protect all
parties to the transaction. Nation-states are interdependent for goods and services. Foreign import of fossil
fuel is only one example.
T9/3 Comment:
Ordonez, R. There is insufficient and inconsistent information which needs to be clarified about the types of waste to be
Pierce Co. Dept of generated by the proposal and about the handling of the waste in regards to disposal and recycling.
Utilities Response:
See responses to comments T9/8 (Page) and T9/9 (Page).
T11/3 Comment:
Schmauder, A. Can the steam be entered into a closed system! Then the water could be reused. Heat could also be removed and
Clover Creek used for productive uses. Could a second steam turbin be added?
Council Response:
See responses to comments T19/60 (Page), T19/61 (Page), T19/62 (Page), and PM53 (Page).
T20/11 Comment:
Tenaska Washington Pg 5-64 Sect 5.17 The project will use approximately 1.3 million cubic meters (45 million cubic feet) of
Partner II, L.P. natural gas per day and approximately 6.8 million liters (1.8 million

gallons) of water per day. Life of project estimates for resources consumed cannot be determined because total operating days not known.

Response:
This information has been included in Volume I, Section 5.17.

T24/8
Sheets, E.
Northwest Power Planning Council

Comment:
The Draft eis states that the consumption of natural gas and fuel oil cannot accurately be determined at this time. We believe that estimates of annual hours of operation on fuel oil can be made.

Response:
See response to comment T20/11 (Page). Operation on fuel oil is limited to a maximum of 120 hours annually; however, there is no scheduled plan to operate on fuel oil.

T24/14
Sheets, E.
Northwest Power Planning Council

Comment:
The first paragraph on page 5-13 draws a comparison with Texas plants which have never operated on fuel oil. The comparability of these plants is questionable.

Response:
See response to comment T24/8 (Page).

ENERGY AND UTILITIES — Water Supply

PM50
Iverson, E.
None Stated

Comment:
They're going to use 380,000 liters (100,000 gallons) of water a day; the people of Tacoma and Pierce County will probably be on ration.

Response:
See responses to comments T19/26 (Page) and T11/2 (Page).

PM52
Schmauder, A.
Clover Creek Council

Comment:
Council members are concerned about the amount of water that is going to be consumed by this project.

Response:
Comment noted. Also see responses to comments T19/26 (Page) and T11/2 (Page), Section 5.11.2 in the eis.

T11/1
Schmauder, A.
Clover Creek Council

Comment:
We are concerned about the 6.8 million liters (1.8 million gallons) of water consumed daily over 20 years.

Response:
See response to comment T11/2 (Page).

T13/1
Evancho, J.
TPU

Comment:
"Water supply needs would be met with the existing available resources from City of Tacoma Public Utilities." - should be clarified by adding the following: Additional facilities will be required to be constructed to bring adequate supply to the site.

Response:
This information has been included in the Feis.

T13/3
Evancho, J.
TPU

Comment:
Page 5-47, 2nd paragraph - Suggest this be revised to indicate that water service is planned and is not presently provided.

Response:
Volume I, Section 5.11.2, Impact EU1, has been revised. Also see response to comment T19/26 (Page).

T13/4
Evancho, J.
TPU

Comment:
Page 7-2 Persons Consulted - Linda McCrea is employed with Tacoma Public Utilities, Water Division, not the Pierce County Utilities.

Response:
Section 7.2 of the eis has been changed to reflect this information.

T13/8
Evancho, J.
TPU

Comment:
Has the proposed facility integrated water re-use and other conservation techniques to minimize the need for public water supplies? Conservation features incorporated into your design should be detailed in the Environmental Impact Statement.

Response:
See responses to comments T19/50 (Page) and T19/61 (Page).

T17/6
Harp, B.
Tacoma-Pierce Co. Health

Comment:
The public wells and water systems within the "4.8 kilometer (3 mile) radius" are individually owned or owned by the private water system purveyors, not by the Tacoma Public Utilities Water Division.

Response:
The text of the eis has been changed to reflect this information in Section 4.3.1, Groundwater.

T19/25
Herman, O.
Rebound

Comment:
The eis should indicate when these peak hour consumption requirements (water usage) are likely to occur and the impacts to other users and rate payers.

Response:

The peak hour water consumption requirements are most likely to occur when the ambient temperature is above 85yF.

T19/26 Comment:
Herman, O. The eis should contain an analysis of the impacts that its water requirements will have on future development.
Rebound Response:
This analysis is included in Volume I, Section 5.11.2, Impact EU1: "The City of Tacoma has indicated that it is willing to continue supplying the needs of Tenaska past the present capacity with the understanding that Tenaska would help fund a new water supply line to the area when and if needed. Additional water supply would be provided with the construction of an additional trunk line from a local reservoir and possibly from local wells.
If wells were used in the area, they would be dug at approximately 305 meters (1,000 feet) in depth, far below local wells currently supplying residents in the area and contained within a separate aquifer. No impacts to the shallower aquifer are anticipated from this action. In addition, use of these deeper wells would be primarily limited to periods when water supply from the Green River and local reservoirs was limited for some reason (e.g., rupture in the supply line or drought) (Linda McCrea, City of Tacoma, pers. comm., March 29, 1993). These sources are expected to provide sufficient water for expected development including the proposed project." Also see response to comment T11/2 (Page).

ENERGY AND UTILITIES Sanitary Sewer

T9/1 Comment:
Ordonez, R. Operation of the proposed project could increase the discharge of water pollutants.
Pierce Co. Dept of Response:
Utilities See discussion in Volume I, Section 5.3.

T9/2 Comment:
Ordonez, R. Currently there is a 162 meter (530 feet) extension of 25-centimeter (10-inch) sewer extending north from the
Pierce Co. Dept of existing 61-centimeter (24-inch) sewer line in 192nd Street East towards the subject property in the future
Utilities proposed roadway identified as 50th Avenue East.
Response:
This information has been included in the Feis Volume I, Section 4.11.2

T9/4 Comment:
Ordonez, R. Will air pollutant stripping produce a wastewater discharge to the sanitary sewer?
Pierce Co. Dept of Response:
Utilities The air pollution control equipment for the project does not utilize water; therefore, no wastewater will be discharged from the air pollution control equipment.

T9/6 Comment:
Ordonez, R. Any potential discharge (accidental or planned) of any of the items listed in the table may require pretreatment
Pierce Co. Dept of prior to discharge into the sanitary sewer system.
Utilities Response:
See the revisions to Impact HY2, Volume I, Section 5.3.2 in the Feis. The plant will incorporate pretreatment of potential discharges of the items listed in Table 5.9-1 prior to discharge into the sanitary sewer system.

T9/10 Comment:
Ordonez, R. There is reference to aqueous wastes generated which would be discharged into the City of Tacoma sewage system.
Pierce Co. Dept of This is incorrect, it will be discharged to Pierce County's sewage system.
Utilities Response:
The Feis has been changed to reflect this information in Volume I, Section 5.3.2, Impact HY2.

T17/2 Comment:
Harp, B. Water from the containment structure should be treated for disposal through the sanitary sewer system.
Tacoma-Pierce Co. Response:
Health The storm water collection system for the fuel oil storage area will be designed to discharge uncontaminated storm water to the biofiltration swale and infiltration pond. If the storm water is determined to be contaminated by fuel oil, it will be diverted to an oil/water separator. The clean water from the separator will be discharged to either the biofiltration swale/infiltration pond or plant wastewater sump. If the storm water is too contaminated by fuel oil to be discharged to either the biofiltration swale/infiltration pond or wastewater sump, a licensed firm experienced in handling and disposing of

this type of waste will be utilized to collect and dispose of the contaminated storm water.

T19/28 Herman, O. Rebound

Comment: The eis requires a clarification regarding the disposition of the 380,000 liters (100,000 gallons) of process, cooling and sanitary waste water per day. Discharged to Pierce County sewage system or City of Tacoma sewage system?

Response: The plant wastewater will be discharged to the Pierce County sewage system. See response to comment T9/10 (Page).

T19/29 Herman, O. Rebound

Comment: The eis must detail the pollution content of the waste water discharge for this project proposal. This discharge may not comply with laws and regulations, which prohibit discharges of cooling water into the Pierce County sewer system.

Response: The plant will be designed and permitted to comply with the Pierce County regulation for wastewater discharges to the sewer system. Pierce County regulations prohibit the discharge of once-through cooling water to the sewer system. There is no discharge of once-through cooling water from the project.

T19/30 Herman, O. Rebound

Comment: The eis must provide detailed account of these chemicals and explain how they will be treated and ultimately disposed of.

Response: The bromine included in the list is used as a cooling water algicide. The phosphonate/agole mixture is used as a corrosion inhibitor in the cooling water. These chemicals will be diluted and added to the cooling tower to control corrosion and algal growth. The cooling tower blowdown will be controlled to meet the Pierce County regulations for discharge of wastewater to the sewer system.

T19/31 Herman, O. Rebound

Comment: The eis must address how the proposed facility's waste water discharge will impact Tacoma's sewage treatment system which currently is in non-compliance.

Response: The proposed facility will not discharge wastewater to Tacoma's sewage treatment system. The plant wastewater will be discharged to the Pierce County sewage treatment system and will comply with the Pierce County regulations for wastewater discharge.

T19/32 Herman, O. Rebound

Comment: The eis must address the potential impacts (heavy metal pollutants) proposed project will contribute to the Pierce County facility (sewage treatment).

Response: The facility will be designed and operated to comply with Pierce County regulations for the discharge of heavy metal pollutants to the sewage treatment system.

T19/50 Herman, O. Rebound

Comment: The device (a demineralizer) is not described in the Deis and its waste stream is not estimated and characterized.

Response: The plant will utilize a demineralizer system consisting of carbon filters, and anion, cation and mixed bed exchange units to supply boiler makeup water. The demineralizer system will generate approximately 227,000 liters (60,000 gallons) per day of wastewater which will be discharged to a neutralization tank and then will be used as part of the makeup water supply to the cooling water. This is an example of water conservation measures included in the project.

T19/61 Herman, O. Rebound

Comment: The eis should consider a water recovery method (used in Rhode Island) that treats and reuses its blowdown water, rather than discharging this as effluent.

Response: The plant will incorporate water conservation methods. This includes recycling the demineralizer regeneration wastewater and boiler blowdown water to the cooling tower. Also, the plant will operate the cooling tower system at 15 cycles of concentration in lieu of the normal industry practice of 8-10 cycles of concentration. This substantially reduces the quantity of makeup water required for the

plant.

Systems like the referenced system located in Rhode Island have been used at sites with no alternative acceptable receiving water body or public sewage system. Such systems generate solid wastes, reduce plant reliability and are costly.

T20/6
Tenaska Washington Partner II, L.P.

Comment:
Pg 5-8 Impact HY2 - Please add: "The waste water discharge meets all of the volume and effluent quality requirements of the Pierce County Utilities Sanitary Sewer System. No need was found for additional waste water treatment or volume reduction through evaporation or reverse osmosis processes."

Response:
This information has been included in Section 5.3.2, Impact HY2.

T26/3
Eustace, J.
U.A. Local No. 82

Comment:
The discharge of storm water from the plant site will affect the county sewer system...the storm water will be discharged onto the ground through a swale system, it is likely that this storm water will infiltrate the county sewer lines.

Response:
Sanitary sewage collection systems are prone to inadvertent infiltration of storm water in those areas where the water table is perched near or above the level of the sanitary system. The Tenaska Washington II project site is, however, located in an area with highly permeable soil and a water table which would be lower than that of the sanitary sewage collection system. Therefore, no impacts from storm water infiltration on the sewage system are anticipated.

ENERGY AND UTILITIES — Storm Drainage

PM27
Giddings, R.
None Stated

Comment:
I'm concerned about the amount of water that will be recharged back into the ground. The problem with putting the sewers in here was that the water wasn't getting back into the ground to recharge the aquifer.

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

T9/7
Ordonez, R.
Pierce Co. Dept of Utilities

Comment:
Any materials discharged from outside of any proposed buildings would not be allowed to include storm water runoff.

Response:
Uncontaminated storm water from the fuel oil storage tank containment will be discharged and disposed of in the biofiltration swale and infiltration pond. Contaminated storm water from the fuel oil storage berm will be diverted to an oil/water separator. The cleaned water will then discharge to either the wastewater sump or the biofiltration swale. If the storm water is too contaminated for discharge to either the biofiltration swale or plant sump, then a licensed firm experienced in handling and disposing of this type of waste will be utilized to collect and dispose of the contaminated storm water. Storm water from the ammonia containment will be discharged to the chemical waste sump and then to the neutralization tank. See the revisions to Impact HY2.

ENERGY AND UTILITIES — Solid Waste Disposal

T9/8
Ordonez, R.
Pierce Co. Dept of Utilities

Comment:
Not enough information in the subject Deis has been provided to determine the types and amount of waste to be generated for disposal and recycling. An appropriate mitigation to solid waste disposal would be the development of a solid waste management plan.

Response:
Office wastes will be sorted for recycling. This material includes packaging material, office paper, and lunchroom waste.

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

		equipment will be returned to the manufacturer for regeneration or disposal.
T9/9	Comment:	
Ordonez, R.	The Deis needs to clarify whether the proposed development intends to dispose of generated waste at other	
Pierce Co. Dept of	undesignated facilities out-of-county or in-county.	
Utilities	Response:	
	The project will comply with Pierce County Flow Control Ordinance (Ordinance #90-4) and other regulations for	
	the disposal of solid waste at approved solid waste handling facilities. If certain special wastes (i.e., used	
	oils, sediment, etc.) cannot be handled by Pierce County designated facilities, the project will comply with	
	applicable sections of the Flow Control Ordinance for approval of other undesignated out-of-county or in-county	
	facilities for disposal of this type of waste.	
T9/12	Comment:	
Ordonez, R.	The Solid Waste Plan supports the recycling of such waste, not burning. An appropriate mitigation would be to	
Pierce Co. Dept of	recycle as much of the land clearing debris as possible.	
Utilities	Response:	
	The reference to "burning and dumping" permits in Section 6.17, Permits, in Volume I of the Feis has been	
	deleted. Land clearing debris will not be burnt. (See response to comment T19/13 [Page]). If appropriate	
	companies can be located that will accept the land clearing debris, the project will utilize their services for	
	the disposal of the debris.	
T19/49	Comment:	
Herman, O.	The eis should describe the destiny of the various solid wastes generated by this project subsequent to 1996,	
Rebound	including but not limited to the waste catalysts from the pollution control devices, which may contain hazardous	
	metals.	
	Response:	
	In addition to the wastes identified in Impact EU1 of the eis, spent catalysts will be returned to the	
	manufacturer for regeneration or disposal as appropriate. Other wastes such as used lubrication and hydraulic	
	oils and sediment from the cooling tower and plant wastewater sumps will be collected and disposed of by	
	licensed firms handling this type of materials. Also see responses to comments T9/8 (Page) and T9/9 (Page	
	).	
T24/5	Comment:	
Sheets, E.	Risks associated with handling and disposition of air pollution control catalysts should be assessed. These can	
Northwest Power	be considered hazardous because of their heavy metal content.	
Planning Council	Response:	
	Spent catalyst from the air pollution control equipment will be returned to the manufacturer for regeneration or	
	disposal.	
T25/5	Comment:	
Wilson, J.	This plant may be using a regeneration system to treat its water. These kinds of systems may involve backwash	
LASER	and the production of solid waste containing high concentrations of toxic materials. This should be in the eis.	
	Response:	
	See responses to comments T19/61 (Page), T19/29 (Page), and T19/50 (Page).	
ENERGY AND UTILITIES		Electricity
PM53	Comment:	
Schmauder, A.	Consider either a second turbine to help use up some of that steam heat, and get that 6.8 million liters (1.8	
Clover Creek	million gallons) of water into a loop where we don't have to expend it; and in the process, remove the excess	
Council	heat and use it for industries and residential uses.	
	Response:	
	The existing steam turbine for the project is designed to exhaust to a condenser at 6.35 centimeters (2.5	
	inches) Hg at 42yC (108yF). A second steam turbine is not possible. Hot water or steam can be supplied to	
	other users.	
	See responses to comments T19/60 (Page), T19/62 (Page), and T19/61 (Page) re water usage and	
	steam supply to industry.	
T19/59	Comment:	
Herman, O.	The alternative of burying power lines associated with this project should be selected.	
Rebound	Response:	

The preferred alternative for electric integration of this proposed plant is the use of underground transmission lines from the plant to the South Tacoma Substation.

T20/4 — Tenaska Washington Partners II, L. P. Partner II, L.P.

Comment:
"Tenaska Power Partners, Inc." should be changed to "Tenaska Washington Partners II, L. P." throughout the document.
Response:
"Tenaska Power Partners, Inc." has been changed to "Tenaska Washington Partners II, L.P." throughout the document.

T23/2 — Mork, E. — EDB Pierce Co. — None Stated

Comment:
The proposed Tenaska plant is in the center of the area that uses most of the power. Power generation at this location will be a very significant contribution in limiting potential voltage sag and economic curtailments that would result from a transmission line failure.
Response:
Comment noted.

ENERGY AND UTILITIES — Natural Gas

PM4 — King, J. — None Stated

Comment:
No matter what technical arguments the natural gas industry can formulate in favor of this plan, the fact is that gas is more polluting and much more expensive than the public is led to believe.
Response:
BPA's Resource Programs eis included an analysis of the environmental trade-offs among a variety of energy resources, including conservation, renewables, cogeneration, combustion turbines, nuclear, coal, and clean coal, as well as a comparison of costs and operating characteristics. Both the potential environmental effects and the costs of gas-fired combustion turbines were considered in reaching a decision to meet load obligations through a mix of conservation, renewables, and thermal generation, including cogeneration and combustion turbines.

PM10 — Abraham, C. — None Stated

Comment:
I understand in your Section 6(c) report, the natural gas for this plant will be supplied by three Canadian sources.
Response:
Comment noted.

PM11 — Abraham, C. — None Stated

Comment:
From my understanding, about a third of natural gas from Canada is critically sour, meaning it comes out of the ground containing more than one percent hydrogen sulfide, a deadly toxic gas.
Response:
See responses to comments PM12 (Page) and T18/14 (Page).

PM12 — Abraham, C. — None Stated

Comment:
0.1 percent hydrogen sulfide is enough to cause instantaneous death in one breath. Exposure to 0.01 percent is enough to cause death or serious illness in children or elderly people, if exposure lasts more than a few hours.
Response:
The natural gas delivered to the site will contain less than one-quarter grain of hydrogen sulfide per 100 cubic feet of gas.

PM16 — Lane, S. — None Stated

Comment:
There's only enough natural gas to satiate current consumption rates in the United States for 16 years.
Response:
Natural gas supply in the U.S. has been in considerable surplus for most of the 1980s. As a result, exploration and development efforts for new resources have been at a low level. The natural gas surplus is now diminishing and economic incentives to explore for new reserves are developing. In addition, technological advances, such as 3-D seismic, have helped locate new reserves in existing fields. Other gas resources, such as tight gas sands, will come into play to a greater degree as gas prices increase. Canada has an abundance of natural gas which is being exported to the East coast, West coast, and Midwest portions of the U.S. BPA believes there will be a supply of natural gas well beyond the 16 year period mentioned.

PM43 — Holbrook, N. — Greenhouse Action

Comment:
Nowhere in this analysis is there a recognition of the cumulative effects of gas generation and its effect on the Northwest.
Response:

The eis discussed cumulative air quality impacts in the Frederickson Industrial Area in Section 5.18. In addition, BPA's Resource Programs eis (February 1993) analyzed the potential regional impacts of BPA adding almost 2000 aMW of gas-fired generation to the existing power system. See response to comment T18/10 (Page).

T18/1
Schullinger, S.
Greenpeace

Comment:
Greenpeace is opposed to the use of natural gas as an energy source, particularly when it is used inefficiently in a combustion turbine.
Response:
Comment noted. Also see response to comment PM8 (Page).

T18/10
Schullinger, S.
Greenpeace

Comment:
Those impacts that are addressed within the statement pertain only to localized impacts instead of those upstream effects that occur with the transport, processing and exploratory drilling of natural gas.
Response:
BPA's Resource Program eis included an evaluation of these impacts for resource types available for meeting expected load obligations, including the utilization of natural gas. See response to comment T18/14 (Page).

T18/11
Schullinger, S.
Greenpeace

Comment:
One-third of all natural gas found in Canada is sour.
Response:
See response to comment PM12 (Page).

ENERGY AND UTILITIES — Back-Up Fuel Oil

PM45
Holbrook, N.
Greenhouse Action

Comment:
We believe a more detailed description of the supply availability of No. 2 fuel oil is warranted. Each utility must analyze its own specific situation for back-up fuel availability when needed for power generation.
Response:
Several terminals are available for delivery of no. 2 fuel oil in the Tacoma/Seattle area. Fuel oil would be delivered by truck from terminal to the site. Three terminals in the Tacoma area and their distance from the site are U.S. Oil - 19 kilometers (12 miles); ARCO - 35 kilometers (22 miles); and Texaco - 43 kilometers (27 miles). Since the project has contracted for firm gas supplies and firm transportation, fuel oil would be used in the event of a gas pipeline shutdown, or an emergency restart from being displaced as requested by BPA. Also see response to comment T24/8 (Page).

T24/13
Sheets, E.
Northwest Power
Planning Council

Comment:
The final paragraph of page 5-10 implies that fuel oil will definitely be used for 120 hours annually. Not so.
Fuel oil is expected to be used ONLY as necessary.
Response:
For modeling purposes, some 120 annual hours of operation on back-up fuel oil were assumed. This covers the event where the plant might be required to operate when the gas-fuel supply is unavailable. Also see response to comment T24/8 (Page).

NOISE

T24/9
Sheets, E.
Northwest Power
Planning Council

Comment:
Vibration as a potential consequence of combustion turbine combined-cycle power plant operation should be assessed.
Response:
Mechanical vibration produced by the drive-train of the gas turbine should be minimal to nonexistent. The rotating shaft and blades are extremely well-balanced to minimize required maintenance and to maintain equipment availability and reliability. In unusual circumstances, due to electric transmission system instabilities, some temporary vibration may be induced in the turbine generator. If this condition is prolonged, electrical protection equipment will function and the generator will disconnect from the transmission system until the instability is corrected. In addition, some vibration may be associated with water circulating pumps, lubricating pumps, etc., but nothing of significance. It is not expected that vibrations from plant equipment will be felt by population located near the industrial area.

VISUAL QUALITY

PM54
Schmauder, A.

Comment:
What will that look like in the wintertime? The steam plume? Will there be some visual effects that the

Clover Creek Council	neighbors are going to be complaining about? Response: The plume will be visible as a cloud rising above the cooling towers. The plume will appear largest under clear skies when the air is cool and moist. Generally, cool, moist conditions are associated with hazy, cloudy, or foggy skies which will obscure the visibility of the plume.
T12/1 Schmauder, A. Clover Creek Council	Comment: Will the plant produce a plume of steam? Will the steam have a visual effect in the winter during the cold weather? Response: The plant will release steam very infrequently and only during abnormal operating (upset) conditions and maintenance operations. Normally steam stays within the facility's closed loop steam systems. Under unusual circumstances on the electric transmission system which required emergency shutdown of the gas turbine, some steam may be temporarily vented to reduce steam pressure within the turbine system. Also see response to comment PM54 (Page) regarding cooling tower visible plume.
T12/3 Schmauder, A. Clover Creek Council	Comment: Will the plant produce a plume of steam? Response: Yes, see responses to comments PM54 (Page) and T12/1 (Page).
ENVIRONMENTAL CONSULTATION, REVIEW, AND PERMIT REQUIREMENTS	
T20/2 Tenaska Washington Partner II, L.P.	Comment: Tenaska will apply for a construction permit prior to the start of construction. Response: Comment noted.
T20/12 Tenaska Washington Partner II, L.P.	Comment: Pg 6-11; Sect. 6.17 Permits - Add the five permits listed to this section. Response: Section 6.17, Permits, has been revised to include these additional five permits: 1) Review per Section 309 of the Clean Air Act by the Environmental Protection Agency. 2) Industrial Waste Discharge Permit from the Washington Department of Ecology. 3) Natural Gas Import Authorizations from the FERC. 4) Determination of Exempt Wholesale Generator from the FERC. 5) Critical Area Review by Pierce County.

3.4 COMMENT DOCUMENTS

3.4.1 Written Comments

Section 3.4.1 contains the comment documents used to prepare this Comment Report. All comment letters and cards that were received as well as the transcript from the public meeting are included. Comments from these documents are marked and annotated with the Comment ID number for reference.

The letters and cards in Section 3.4.1 are consecutively ordered by document number (T7 through T27). The document number is annotated on the lower right hand corner of each page of the document for easy reference. Comments within a document are consecutively numbered. Table 3.4-1 precedes the letters and cards and lists the document numbers and the corresponding authors.

3.4.2 Oral Comments

Table 3.4-2 precedes the public meeting transcript and lists the commenters and their comments and location of comments by transcript page number. Comments in the transcript are consecutively numbered (PM1 through PM62).

WRITTEN COMMENTS

TABLE 3.4-1
Written Comments Key

Document No. *	Author
T7	Pierce County Fire Prevention Bureau - Wayne Wienholz
T8	Washington State Department of Community Development - Robert Whitlam
T9	Pierce County Department of Utilities - Robin Ordonez
T10	Tahoma Audubon Society - William Giddings
T11	Clover Creek Council - Al Schmauder
T12	Clover Creek Council - Al Schmauder
T13	Tacoma Public Utilities - Jane Evancho
T14	U.S.D.A. Soil Conservation Service - James Moore
T15	Washington State Department of Natural Resources - Sandy Norwood
T16	Daniel Meek
T17	Tacoma - Pierce County Health Department - Brad Harp
T18	Greenpeace - Sally Schullinger
T19	Rebound - Otto Herman
T20	Tenaska Washington Partners II, L.P.
T21	Tacoma Public Utilities - Richard Curtice
T22	U.S. Environmental Protection Agency - Kathy Veit
T23	Economic Development Board for Tacoma - Pierce County - Erlig Mork
T24	Northwest Power Planning Council - Edward Sheets
T25	LASER - Jim Williams
T26	U.A. Local No. 82 - James Eustace
T27	John Williams

* T1 - T6 are written comments received during the scoping process and were addressed in the development of the Deis.

Pierce County
Fire Prevention Bureau

WAYNE A. WIENHOLZ
Fire Marshall

2401 South 35th Street
Tacoma, Washington 98409-7494
(206) 591-7230 . FAX (206) 591-3131

August 13, 1993

LYNN W. BAKER
ACTING PUBLIC INVOLVEMENT MANAGER
P.O. BOX 12999
PORTLAND, OREGON 97212

RE: TENASKA WASHINGTON II GENERATION PROJECT
Fire Prevention Bureau Comments

Dear Ms. Baker

We appreciate the opportunity to provide comments on the draft environmental impact statement for the Tenaska Generation Project. With reference to Section 4.8.5, please note that the Fire Prevention Bureau is now a division of the Pierce County Department of Emergency Management.

Our greatest concern is with Impact HS3; "Hazardous substances used or generated during power plant operations could be spilled and released to the environment."

Fuel oil storage: The large fuel oil storage tank presents the potential for a serious fire problem requiring large quantities of water for an extended period. At least 6000 gpm should be provided for a period of not less than 6 hours. In addition, foam fire protection shall be provided in accordance with Section 79.510 of the Uniform Fire Code.

Other hazardous materials: The storage, handling and use of other hazardous materials such as anhydrous ammonia, sulfuric acid, caustic soda and bromine shall be in accordance with Article 80 of

the Uniform Fire Code. Because ammonia will ignite and burn, it will be handled as both a corrosive and a flammable gas.

The large fire flow requirement, provisions of foam fire protection and need to handle ammonia as a flammable gas are not clearly identified in the Code. Therefore we feel that it is important to establish these needs for mitigation of fire protection/health and safety impacts.

If you have any questions you may call Assistant Fire Marshal Russ Henderson at (206) 596-2754. Our business hours are from 7:30 AM to 4:30 PM, Monday through Friday.

Sincerely,

Wayne A. Wienholz
Fire Marshal

WAW:RLH
cc: Pierce County FPD #7
AFM Russ Henderson
F:\WPFILES\TENASKA.RLH

STATE OF WASHINGTON

DEPARTMENT OF COMMUNITY DEVELOPMENT
OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
111 21st Avenue S.W. . P.O. Box 48343 . Olympia, Washington 98504-8343 . (206)753-4011 . SCAN 234-4011

August 18, 1993

Ms. Lynn W. Baker
Acting Public Involvement Manager
Post Office Box 12999
Portland, OR 97212

Log: 081093-32-BPA
Re: BPA eis - Tenaska WA II Generation Project

Dear Ms. Baker

We have reviewed the materials forwarded to our office for the above referenced project. A search of our records, including the National and State Registers of Historic Places and the Washington State Archaeological and Historic Sites Inventories, indicates no resources included in or eligible for inclusion in the National Register of Historic Places have been recorded in the identified project area.

These comments are based on the information available at the time of this review. Should additional information became available, our assessment may be revised. In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity should be discontinued and this office notified.

Thank you for the opportunity to comment on this project. A copy of these comments should be included in subsequent environmental documents. If I can be of further assistance, I can be reached at (206) 753-4405.

Sincerely,

Robert G Whitlam, Ph.D.
State Archaeologist

RGW:aa

T8

encourage industries to develop waste management plans and implement recycling programs for the waste they generate.

4. Page 5-17, Compliance with standards for air toxics - Will air pollutant stripping produce a wastewater discharge to the sanitary sewer? If so, some type of an acceptable pretreatment device must be reviewed and approved by the Washington State Department of Ecology and the Pierce County Department of Utilities prior to discharge into the sanitary sewer system.

5. Page 5-36, Impact HS3, Hazardous substances used or generated during power plant operations could be spilled and released to the environment. Hazardous material may be produced from air pollution control equipment and from wastewater pretreatment equipment, if it is required for compliance with local limits. Pretreatment to remove metals would result in metals sludges, which would most likely be a hazardous material. "If contamination from the fuel oil tank does occur, the runoff can be redirected into the oil/water separator for eventual discharge into the sanitary system". If a discharge to the sanitary sewer system were allowed, it would have to be directed to an enhanced coalescing plate oil/water separator.

6. Page 5-37, and 5-47, Table 5.9-1, Major Hazardous Substances Stored at the Proposed Power Plant - Any potential discharge (accidental or planned) of any of the items listed in the table may require pretreatment prior to discharge into the sanitary sewer system. In addition, for any materials discharged from outside of any proposed buildings would not be allowed to include stormwater runoff. Ordinance 91-190S, Section 13.04.040, Unlawful Use of Public and Private Sanitary Sewer Systems, paragraph C, specifically prohibits the discharge of storm drainage into the sanitary sewer system.

7. Page 5-38, Impact HS3, Mitigation Measures - There is reference to a Spill Prevention Containment and Countermeasure Plan could be instituted. Depending on the type of connection to the sanitary sewer system and the spill potential into floor drains (if any are proposed), the Department of Utilities will require the plan as part of the pretreatment review process.

8. Page 5-48 & 5-49 Solid Waste Disposal - The document indicates that waste would "likely" be collected by LeMay Disposal and disposed at the Land Recovery Landfill which is the Hidden Valley Landfill. There is no discussion with regard to recycling programs and indicates an intent to burn a potentially recyclable material. Not enough information in the subject Deis has been provided to determine the types and amounts of waste to be generated for disposal and recycling. An appropriate mitigation to solid waste disposal would be the development of a solid waste management plan and the implementation of a source-separation recycling program. In addition, the State legislature amended RCW 19.27 to require that all new commercial/industrial and multi-family development provide outdoor space for container storage of recyclable materials. There are a number of companies which provide recycling collection service in Pierce County, including the franchised solid waste collection companies. With regard to long-term disposal, Pierce County has entered into an

agreement to allow temporary transport of some waste out-of-county by Land Recovery, Incorporated, to extend the life of the privately owned Hidden Valley Landfill. The County has also begun a landfill siting process for a County-owned Landfill. Pierce County has adopted a Flow Control Ordinance (Ordinance #90-4) which provides for the designation of solid waste handling facilities and makes unlawful the handling of solid waste at facilities other than those designated. The list of approved facilities is published each year. The Deis needs to clarify if the proposed development intends to dispose of generated waste at other undesignated facilities out-of-county or in-county. Provisions within the Flow Control Ordinance require approval from the County of such activity.

9. **Page 6-8, 6.16.2 Water - The initial paragraph states that a Spill Prevention Control Countermeasure Plan is submitted to Ecology for review and to the Tacoma-Pierce County Health Department for approval of compliance with regulatory requirements. It should be pointed out that the Pierce County Department of Utilities may also be included in the review and approval of the spill prevention program if there is a potential for spillage to occur into the sanitary sewer system. In the second paragraph, there is reference to aqueous wastes generated would be discharged to the City of Tacoma sewage system. This is incorrect, it will be discharged to Pierce County's sewage system. Both the County and Tenaska are responsible for compliance with the Clean Water Act not the City of Tacoma since the electrical generation facility is regulated as a categorical industry under 40 CRF 423 with specific discharge standards.**

10. **Page 6-11, 6.17 Permits - An Industrial Discharge Permit will be required for the facility in accordance with the pierce County Department of Utilities Industrial Pretreatment Program. There is also reference on this page for "burning and dumping" permits from the Washington Department of Natural Resources. The proposed project is within the Puget Sound Air Pollution Control Authority's (PSAPCA) urban area which has a burn ban and burning permits are under that agency's regulations. Land clearing debris is not identified in previous sections as a generated waste although it is recognized that a certain amount of land clearing will be necessary to construct the proposed facility. The Solid Waste Plan supports the recycling of such waste, not burning. An appropriate mitigation would be to recycle as much of the land clearing debris as possible. There are a number of private businesses which recycle/compost land clearing and other organic debris in the County and certain types of source-separated land clearing debris can be accepted at the Landfill for composting in the County's Yard Waste Composting Facility.**

11. **Page 7-2, 7.2 persons Consulted - Jim Landon and Sally Sharrard's name are incorrectly spelled in the document. Steve Elseth and Linda McCrea are not employed by Pierce County Department of Utilities. We believe they are employed by the City of Tacoma Water Division.**

This concludes our comments with regard to the subject Draft Environmental Impact Statement. The owner should also be aware that sanitary sewer capacity is presently available for the proposed usage on the property. However, capacity is limited and all remaining capacity in the County's sanitary

T9

sewer system will be sold on a first-come, first served basis at the time the connection charges are paid in full. The County cannot guarantee how long that capacity will be available when the owner decides to purchase it.

Should you have any questions or require any additional information,

you may contact me at your earliest convenience.

Very truly yours,

ROBIN R. ORDONEZ, P.E.
Manager of Engineering

RRO/cmb
Cors\U36055.RRP

cc: Charles Alton, Environmental Coordinator, Office of Energy Resources
RAE, P O Box 3621, Portland OR 97212

T9

Comments on Draft eis, Tenaska Washington II

William Giddings **September 8, 1993**

My name is William Giddings, I reside at 12211 C Street South in Parkland, and I am appearing on behalf of the Tacoma Audubon Society. I teach environmental chemistry; however, the university for which I work is in no way responsible for my comments this evening.

The draft eis makes it clear that this is a project-specific proceeding, not addressing explicitly any alternative means of supplying energy which are higher in priority under the 1991 Northwest Conservation and Electric Power Plan: conservation and efficiency improvements, renewable resources, and high efficiency cogeneration. Despite testimony from public utilities and public interest groups that the Bonneville Power Administration had refused to participate in conservation proposals at a lower cost than this proposal, including one from Snohomish PUD for 240 megawatts equal in yield to this project, the Northwest Power Planning Council on August 11 adopted a Record of Decision that this project is consistent with Section 6(c) of the Power Plan. Although that issue may appear to be settled, the eis nonetheless speaks to a number of the concerns involved in those proceedings, making them still relevant to this evening's public hearing.

The required No=Action Alternative paragraph concludes that unless BPA contracts for purchase of the power to be generated by this project, it is unlikely that it will be built, unless another customer for that much power should be found. Action on the project cannot be taken until after the end of the comment period for this eis, so it is not too late for BPA to conclude that no project, or a different project, would be preferable to this one. The testimony at the July 12 Northwest Power Planning Council showed in detail how Bonneville policies and procedures, not questions of cost effectiveness or feasibility, have resulted in failure to implement conservation and efficiency improvements for more energy and at a lower cost than this project. Although the environmental impact of this project may be considered the "relatively benign" compared with a comparably sized coal fired generating facility, there is no evidence that identifiable conservation and efficiency projects would not be a better choice environmentally.

Among the strongest objections to increased reliance on fossil fuel combustion as an energy source is the concern for carbon

T10

dioxide's contribution to potential global warming. Although the United States Congress did not enact a proposed energy tax this session, that is no reason to assume that national policy and international agreements will not include a carbo tax during the life of this project, or even before it comes on line. Whatever the tax structure may do to the economic viability of the project, the reason for our concern is the global environmental impact of increased carbon dioxide emissions. Tenaska has recognized the importance of question in its proposed carbon sequestering offset program. A range of 7 to 50% of carbon dioxide sequestering is proposed, depending upon the mix of specific forest preservation and reforestation programs in the Pacific Northwest, Russia, and/or Costa Rica. Looked at from the other side, this means that from half to nearly all of the plant's emissions would remain unmitigated. While we applaud the approach, and Tenaska's willingness to address the problem, a 7% offset appears woefully inadequate. Offsets for criteria air pollutants in non-attainment areas must exceed 100%. many of the world's leading atmospheric scientists view global warming as the single greatest threat to the future of humanity and the environment, far more important than any of the air pollutants currently regulated. Before the final eis is written, a more conclusive commitment to an offset exceeding 50% and approaching 100% should be demanded. If that is found to be too expensive, I submit that society cannot afford this project. The Oregon Public Utilities Commission recently adopted a range for analysis of $10 to 40 per ton of CO2 emitted. It is noteworthy that insurance companies would not provide coverage against carbon risks associated with this project, nor is Tenaska assuming the risk -- it is the ratepayers who are at risk for the potential costs of addressing the risk of further dependence on fossil fuels assumed by humanity and the global environment as a whole.

T10

U.S. DEPARTMENT OF ENERGY
Bonneville Power Administration

COMMENT FORM

Please mail to BPA Public Involvement, P.O. Box 12999, Portland, OR 97212

BPA would like your comments or questions regarding the Tenaska II project and the content of the draft Environmental Impact Statement. You are welcome to fill in this form, write a letter, or use any other format appropriate to convey your ideas. The comment period closes October 4, 1993.

8 Sep. '93

We are concerned about the 1.8 million gallons of water consumed daily over 20 years. This amount of use will likely cause Tacoma to drill other wells to meet water requirements in the future. This many eventually deplete the aquifer.

Can the stem be entered into aa closed system! Then the water could be reused. Heat could also be removed and used for productive uses.

Could a 2nd steam turbine be added?

Name Al Schmanuder
Organization Clover Creek Council
Mailing Address 1602 129th St E
City Tacoma State WA Zip 98445

(g:mtgcommt.doc 9/7/93)

T12

U.S. DEPARTMENT OF ENERGY
Bonneville Power Administration

COMMENT FORM

Please mail to BPA Public Involvement, P.O. Box 12999, Portland, OR 97212

BPA would like your comments or questions regarding the Tenaska II project and the content of the draft Environmental Impact Statement. You are welcome to fill in this form, write a letter, or use any other format appropriate to convey your ideas. The comment period closes October 4, 1993.

8 Sep '93

Will the plant produce a plume of steam? What will be the long term effect of releasing 1.8 million gallons of water into the air? Will the steam have a visual effect in the winter during the cold weather?

Name Al Schmanuder
Organization Clover Creek Council
Mailing Address 1602 129th St E
City Tacoma State WA Zip 98445

(g:mtgcommt.doc 9/7/93)

T12

Tacoma Public Utilities

Mark Crisson
Director

3628 South 35th Street
P.O. Box 11007
Tacoma, WA 98411-0007

Divisions
Light
Water
Belt Line

October 1, 1993

Public Involvement Manager
Department of Energy
Bonneville Power Administration
PO Box 12999
Portland, Oregon 97212

RE: Tenaska Washington II Generation Project Draft Environmental Impact Statement

Dear Sir:

The Water Division has reviewed the Draft Environmental Impact Statement on the proposed Tenaska project and has the following comments with regard to the discussion of water supply and water service:

page S-8 statement "Water supply needs would be met with the existing available resources from the City of Tacoma Public Utilities." This should be clarified by adding the following - Additional facilities will be required to be constructed to bring adequate supply to the site. Tenaska will be required to contribute to the cost of this construction.

page 4-6, 1st paragraph: "...there are 450 private and 45 public water supply wells within a 4.8 kilometer (3-mile) radius of the proposed site. These public wells are under the authority of the City of Tacoma Public Utilities." This statement is not correct. These public wells are under the authority of a number of water purveyors.

page 5-47, 2nd paragraph: "...The City of Tacoma has indicated that they are willing to continue supplying the needs of Tenaska past the present capacity with the understanding that Tenaska would help fund a new water supply line to the area when and if needed. These include: increased withdrawal from local

T13

reservoirs and the Green River and the development of new wells(s) from deeper aquifer sources. Additional water supply would most likely come from local reservoirs."

Suggest this be revised to indicate that water service is planned and is not presently provided. Water supply options to meet the area's future needs should also be clarified to read: "... The City of Tacoma had indicated that they are willing to assure supply for Tenaska will be available with the understanding that Tenaska would help fund a new water supply line to the area when and if needed. Additional water supply to the area would most likely be provided with the construction of an additional trunk line from a local reservoir and possibly from local wells."

page 7-2 Persons Consulted - Linda McCrea is employed with Tacoma Public Utilities, Water Division, not the Pierce County Utilities

Water Quality Impacts:
page 3-7, On-Site Fuel Storage- The proposal states that "fuel oil

would be stored on-site in an approximately 5,565 cubic meter (35,000-barrel) tank surrounded by an earthen dike. The volume enclosed by the dike would be sufficient to contain the contents of the tank if it failed." The Water Division has had recent experience with fuel oil spills int he Fredrickson area. Given the highly permeable nature of the soils at this site. We would suggest that the Department of Ecology Guidelines for spill containment be followed (enclosed) which calls for concrete diking or impervious containment dike.

Groundwater Quality monitoring: Will a groundwater monitoring program be implemented, including adequate characterization of background conditions, to identify any deterioration in groundwater quality which may result from the construction and/or operation of the facility?

Aquifer Protection Area Development Regulations: Since the proposed project is located within an Aquifer Recharge Area designated by Pierce County under requirements of the State Growth Management Act (Chapter 37.70A RCW), the Tacoma Water Division will request that the Tacoma-Pierce County Health Department impose, under authority of Pierce County Code Chapter 21.16.

T13

(Aquifer Recharge Areas), monitoring requirements and other appropriate mitigation measures necessary to protect groundwater quality.

Water Use Efficiency - Conservation: has the proposed facility integrated water re-use and other conservation techniques to minimize the need for public water supplies? We are aware that cooling water for the proposed plant goes through multiple cycles. This and other conservation features incorporated into your design should be detailed in the Environmental Impact Statement.

Thank you for the opportunity to comment on the subject document. Please feel free to contact me at 591-9738 with questions regarding these comments.

Sincerely yours,

Jane C. Evancho
Resource Planning Manager

Enclosure

smc

cc: Steve Marek, TPCHD
Ken Merry

T13

GUIDELINES TO
PREVENT, CONTROL AND CONTAIN SPILLS

**FROM THE
BULK STORAGE OF PETROLEUM PRODUCTS**

**Water Quality Planning and Management Section
Office of Water Programs
Department of Ecology
Olympia, WA 98504**

August 1983

WDOE 83-8

T13

This isolation may be accomplished by the use of concrete or asphalt berming along with grading of the ground surface to provide the desired drainage patterns. Caution: Asphalt is not compatible with gasoline and solvents. The effectiveness of asphalt as a barrier may be significantly reduced over time due to the actions of solvents and sunlight.

Efficient collection of oil contaminated storm water may require changes in the grading or surfacing of potentially contaminated areas. This may include regrading to change runoff patters and/or resurfacing, to improve runoff and eliminate oil saturation of the surrounding area, and to reduce potential contamination of ground and surface waters. In addition, a system of catch basins and piping may be needed.

TReaTMENT

Once the oily contaminated water is collected, the minimum treatment necessary for the removal of oils is a gravity oil/water separator.

For further information on the design details of gravity-type separators, refer to the Department of Ecology's "Guidelines for the Design of Gravity Oil/Water Separators."

The effluent discharged from any oil removal/treatment facility must contain no visible oil and no more than 15 parts per million total oil as a daily maximum.

Further treatment of the storm waters may be required depending on its characteristics, the location of bulk facility, and the nature and proximity of the ground and surface waters.

SPECIAL CONTROL PROVISIONS

In addition to the above features, there are several areas where specific provisions are available to control the loss of product. Some of the following design or operation provisions are required, others are only recommended, but all are reasonable and practical methods of control and containment.

Above-Ground Tanks

Steel tanks are preferred, but are subject to corrosion and electrolysis. Steel tanks must be periodically tested to verify the integrity of the steel. Number each tank clearly and identify the product type stored within.

All tanks should be located on a reinforced concrete pad that rests on a well drained and compacted footing. Curbing and flooring should extend at least three feet around the product pump(s). Spillage and spray from the pump should be collected periodically and handled in an acceptable manner.

Concrete diking or an impervious containment dike, completely surrounding above-ground storage tanks, must be provided to impound spillage from a tank. Within the containment dike, an impervious floor must be provided

to keep the oily waters and spillage from entering the waters of the state. The dike must impound a minimum volume equal to the volume of the largest single tank inside the dike, plus 10 percent for storm water. The tanks should be located no closer than five feet to the dike. Expansion joints should be constructed out of a material that is compatible with the stored product(s).

A sump to collect the storm water should be provided inside the dike and ahead of a lockable drain valve. This drain should be sized for rapid draining of the area. This valve should be closed when not being used to drain the area. This valve should be open only under close supervision. When the area is drained, the valve should be closed and locked again.

Provisions should be made to drain off the storm water while preventing the escapement of spilled product. For example, a down turned elbow incorporated in the sump meets these provisions.

High level alarms are available to help prevent spills due to accidental over-filling. Installed alarm systems should be periodically tested to ensure that they function properly.

Below-Ground Tanks

If below-ground tanks are used, a leak detection system, such as monitoring wells, should be incorporated in the facility. The testing results should be recorded in the plant's operation and maintenance records.

All below-ground tanks, lines, and piping should be provided with cathodic protection provisions.

Storage tanks and lines must be routinely tested for integrity, as electrolysis and corrosion tend to waken the metal. Routine pressure or vacuum tests should be performed on the storage tanks and distribution lines. The early detection of leaks helps to reduce the loss of the product and the contamination of surrounding soils and surface and ground waters.

Tank Water Draw-off

Water drawn from petroleum storage tanks must be inspected for oil before discharging. If the waters are oily, they should be routed through a gravity oil/water separator before release. The water draw-down valve should be locked and plugged at all times, except when it is being used. When open, the valve must be manned at all times.

Barrel Storage

Barrels used to store petroleum products must be securely stoppered and stored in an upright position. The storage area should be covered and curbed or otherwise constructed to contain spillage. Drip pans should be used to collect drips from all barrels. An imperious floor surrounding and underneath the storage area(s) must be provided to retain the oily waters and spillage on site. An exception to this requirement may be allowed depending on soil type, product type, and depth to ground water.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
10923 CANYON ROAD eaST
PUYALLUP, WA 98373
PHONE #(206) 536-2804

DATE: October 1, 1993

To: Lynn Baker, Acting Public Involvement Manager
P. O. Box 12999
Portland, OR 97212

Thanks for the opportunity to review and make comments on the Draft Environmental Impact Statement (Deis) for The Tenaska Washington II Generation Project.

I have reviewed the Draft Environmental Impact Statement (Deis) for the Tenaska Washington Generation Project and I have no comments.

James E. Moore
District Conservationist

CC: Ron Shavlik, AC, Olympia, WA
Ross R. Lahren, SRC, Spokane, WA

T14

WASHINGTON STATE DEPARTMENT OF
Natural Resources

JENNIFER M. BELCHER
Commissioner of Public Lands

October 4, 1993

KALEEN COTTINGHAM
Supervisor

Lynn W. Baker
Acting Public Involvement Manager
Bonneville Power Administration
PO Box 12999
Portland OR 97212

SUBJECT: Tenaska Washington II Generation Project - Deis

We have reviewed the Deis for the Tenaska Washington II Generation Project and have the following comments:

- **Table 4.5-1, page 4-19. The state status given for Aster curtus is incorrect. Aster curtus is listed by the state as sensitive. The Department of Natural Resources definition of sensitive is a vascular plant taxon that is vulnerable or declining, and could become endangered or threatened in the state without active management or removal of threats.**

- **Page E-S, (re: white-top aster) contains a statement that no evidence of Idaho fescue (often associated with Aster curtus was observed at the project site Contradictory to this statement, Table E-1 on the following page lists Festuca idahoensis (Idaho fescue) as one of the plants observed at the Tenaska Site.**

I hope that you will find these comments useful.

Sincerely,

**Sandy Norwood, Environmental Review Coordinator
Washington Natural Heritage Program
Division of Land & Water Conservation
PO Box 47O47
Olympia, WA 985O4-7O47
(2O6) 9O2-1667**

**1111 Washington ST SE PO BOX 47000 Olympia, WA 93504-7000
Equal Opportunity/Affirmative Action Employer**

TI5

**DANIEL W. MEEK
ATTORNEY & CONSULTANT
1935 N.E. CLACKAMAS STREET
PORTLAND, OREGON 97232**

**OFFICE
(503) 281-2201
MODEM/TELEPHONE
(503) 281-2282**

October 4, 1993

**Public Involvement Manager
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97212**

RE: Comment on BPA Draft eis: Proposed Tenaska-Washington II Generation Project (DOE/eis-0194)

Dear BPA:

The following are comments on the BPA Draft eis: Proposed Tenaska-Washington II Generation Project (DOE/eis-0194) prepared for SESCO, Inc.

The Draft eis is deficient in its failure to consider alternatives to the project, such as increased conservation. BPA is not acquiring all available cost-effective conservation. This issue is discussed in the enclosed two documents, which are to be included as part of these SESCO comments:

1. Testimony of Richard Esteves, vice-president, SESCO, Inc., before the Bonneville Power Administration Task Force of the Committee on Natural Resources, U.S. House of Representatives, July 12, 1993.

2. Letter dated September 23, 1993, from Daniel Meek to Peter DeFazio, Chair, Task Force on BPA, U.S. House of Representatives (with 3 attachments).

Please let me know how to obtain copies of comments filed by others on this Draft eis. Thank you.

Sincerely,

Daniel Meek T16

Letter from Daniel W. Meek was followed by four attachments. Interested parties may obtain copies of these by calling BPA's

document request line at 1-8OO-622-452O. The attachments include:

1. Letter to Peter DeFazio, Chair, Taskforce on BPA, dated September 23, 1993, from Daniel Meek.

2. Memorandum dated January 21, 1993, from Pam Brandis, Public Utilities Specialist, Program Evaluation Section-RPEB (BPA), to Ruth Ann James, Public Utilities Specialist, Resource Demand Section-RPED and Fev Pratt, Section Chief, Programs Section-RM (both of BPA).

3. Journal Article: Joskow, Pauland Marron, Donald, "What Does a Megawatt Really Cost? Further Thoughts and Evidence." The Electricity Journal, July 1993.

4. Testimony of Richard Esteves, Vice President SESCO, Inc., before the BPA Taskforce of the Committee on Natural Resources U.S. House of Representatives, July 12, 1993.

Board of Health
KAREN VIALLE, Chair - Tacoma Mayor
DOUG SUTHERLAND, Vice-Chair - Pierce County Executive

TACOMA-PIERCE COUNTY
HeaLTH DEPARTMENT

Director of Health
FEDERICO CRUZ-URIBE, MD, MPH

Lynn W. Baker
Acting Public Involvement Manager
Bonneville Power Administration
P.O. Box 12999
PORTLAND, OR 97212

RE: Tenaska Washington II Generation Project Draft Environmental Impact Statement Comments.

Dear Ms. Baker:

The Tacoma-Pierce County Health Department is in receipt of the above noted document. After reviewing this document, the Health Department would like to offer the following comments:

3.1.2 Proposed Facilities

The secondary containment structures for the fuel oil storage tanks (35,000 barrels) should be designed to contain a "worst case" spill. This includes storm water collection calculations. Water from the containment structure should be treated for disposal through the sanitary sewer system (use the sanitary sewer system to eliminate any chance of a spill discharging through the storm system). Containment or monitoring features should be included to determine leakage by the fuel tank piping system.

4.2.1 Geology and Soils

Regionally the Vashon Till acts as a protective layer for deep ground water sources. However, the Steilacoom Gravel at this site is not underlain by Vashon Till. The till unit in this area was eroded by recessional outwash channels. The stratigraphy beneath this site consist of Vashon Recessional Outwash overlying a Cashon Advance Outwash unit.

4.3 Ground Water

Ground water flow direction within the Clover/Chambers Creek Basin is not toward Commencement Bay. Most ground water originating in this basin flows toward "the Narrows", a narrow water channel separating Tacoma from the Gig Harbor Peninsula.

4.3.1 Ground Water

The public wells and water systems within the "3 mile radius"

area are not owned by the Tacoma Public Utilities Water Division. These wells are individually owned or owned by private water system purveyors.

Ground water quality in this area has been undergoing degradation. Documentation of this fact has been ongoing since approximately 1985.

3629 South D Street . Tacoma, Washington 98408-6897 206/591-6500

T17

The wetland area bordering the south side of 192nd St. East is the surface of the local ground water table. Fluctuation in the water table throughout this area has been documented to be as much as 15 feet during a one (1) year period.

The Health Department agrees that this area has very little protection from potential ground water contamination.

Ground Water Regulations

Pierce County has adopted a "Critical Areas" designation which includes the area in and around this site. The designation is for an "Aquifer Recharge Area" (Pierce County Code Chapter 21.16). The purpose of this chapter is to prevent further degradation of ground water quality through the control of land use activities. The Tacoma-Pierce County Health Department requires submittal of a hydrogeological assessment, to determine the potential impact to ground water resources, for every commercial facility proposed within the Aquifer Recharge Area boundary.

5.4.2 Impact and Mitigation Measures

The surrounding land surface and subsurface is composed primarily of sands and gravels. This material has a negligible effect in remediating surface contaminants. What effect will particulates and other combustion by-products have on the surrounding ground water recharge area? Keep in mind that this region is a prime recharge area for the City of Tacoma's wells and other local water system wells.

6.16 Hazardous Waste

Agreed. A hazardous Materials Handling Plan and Spill Prevention Control and Counter Measure Plan should be submitted for review to the Department. Approval by the appropriate agencies should be required prior to final building approval or occupancy.

The Fredrickson area is extremely vulnerable to ground water contamination. This Department cannot emphasize sufficiently the importance of protecting this resource. Every effort must be made to control hazardous material spills, leakage, and all other possible sources of contamination.

If you have any questions regarding these comments, please contact me at (206) 596-2851.

Sincerely,

Brad D. Harp, Hydrogeologist
Environmental Health Specialist III
Water Resources Section

cc: Jane Evoncho, Tacoma Public Utilities Water Division

T17

ADELAIDE - AMSTERDAM - ANCHORAGE - AUCKLAND - BOSTON - BRUSSELS - BUENOS AIRES - CHICAGO - COPENHAGEN - DUBLIN - FORT LAUDERDALE - GOTHENBERG - HAMBURG - LEWES - U.K. - LONDON - LUXEMBOURG - MADRID - MONTReaL - OSLO - PALMA DE MALLOCRCA - PARIS - ROME - SAN FRANCISCO - SAN JOSE - COSTA RICA - SeaTTLE - STOCKHOLM - SYDNEY - TORONTO - VANCOUVER - VIENNA - WASHINGTON - WORLD PARK BASE- ANTARCTICA - ZURICh

GREENPeaCE

Greenpeace USA . 4649 Sunnyside Ave N . Seattle WA 98103 . Tel (206) 632-4326 . Fax (206) 632-6122.

Lynn W. Baker
Acting Public Involvement Manager
P.O. Box 12999
Portland, OR 97212

September 31, 1993

Dear Ms. Baker,

On behalf of Greenpeace, I am submitting comments on the Draft Environmental Impact Statement for the proposal Tenaska II Washington Generator. As the Northwest Energy/Climate Change Campaigner for Greenpeace, I am deeply concerned about the environmental impacts of this proposed project.

The following pages are written with the intent to provide BPA with a more detailed analysis of those environmental impacts of the proposal that have not been considered in the Draft Environmental Impact Statement (eis). Specifically, these impacts include the upstream effects of the exploratory drilling processing and transportation of natural gas. Additionally, there are certain sections of the eis that, in my opinion, fail to address significant issues in the manner their gravity warrants.

To begin with, Greenpeace is opposed to the use of natural gas a an energy source, particularly when it is used efficiently in a combustion turbine. While much has been said of the qualities of natural gas that appear to make it a friendly, benign resource, all of the negative aspects inherent in any fossil fuel are routinely ignored. While it is true that CO2 content is less in natural gas than oil or coal, the amounts are still significant enough to v concern. In fact, in Canada, the CO2 content in raw gas has been estimated at 7-14%, a figure that the National Energy Board admits is conservative.

Natural gas is also 80-95% pure methane, a greenhouse gas twenty times more potent than carbon dioxide over a 100-year span and 60 times more potent over a twenty year span. While the lifespan of methane within the atmosphere is much shorter than that of carbon dioxide, the cause for concern is much greater if one considers that global warming feedback mechanisms will probably happen within decades. Seen in this light, it is a wonder that natural

gas has gotten such a clean bill of health These are hardly the only reasons gas is far from being the safe, environmentally sound fuel; the cumulative impacts from the exploratory drilling and the processing of raw gas are ingredients for a truly destructive form of energy and an area I will address later in my comments.

With regard to specific points made in the Draft eis, I will

simply deal with each section in chronological order.

5.4. Air Quality

The proposed site for the Tenaska facility lies in a region that has been designated as a nonattainment area for CO and Ozone. While your figures show that the gas plant will not make an individual contribution that exceeds current air quality standards, you fail to recognize that increased industrial activity will certainly make it much more difficult for this area to come into compliance with stricter air quality regulations. T18/4

Impact AQ3 - Global Warming

I find it inconceivable that an issue as important and as vital to our common future as global warming should be given such short attention as was demonstrated in the Draft eis. While admittedly leadership on this subject has certainly not been forthcoming from our present administration, there is no reason for a federal body not to show some initiative and address the threat of climate change with the concern the issue merits. T18/S

The Intergovernmental Panel on Climate Change (IPCC), an international body made up of 300 leading climatic scientists has declared that in order to stabilize atmospheric concentrations of man made greenhouse gases, a global cut in emissions of more than 60% is needed. In other words, the only way to truly halt climate change is to prevent it; a move that will not be accomplished by building yet another fossil fuel fired plant. Carbon sequestration does not sufficiently address the problem that our addiction to fossil fuels has created. Planting trees in response to emissions is a simplistic and easy out for those who cannot accept the responsibility to change their habits. T18/6 T18/6B

5.8 Socioeconomics

While the socioeconomic of a proposed project may not appear to have any significant impact on what is commonly thought of as environment (trees, rivers, cute and fuzzy animals), the issue has a great deal to bear on the urban environment, a place in which local citizens must live to the best of their ability The

effect such a project will have on the employment rate must be one of first consideration, especially in a depressed economy.

The Draft eis states that approximately 275 construction jobs and 30 permanent positions will be created with the proposed project. Out of the 30 permanent positions there is the strong possibility that half the workers will be coming in from outside the region. While the eis would have us believe that the proposed project will have a beneficial impact on the local community, this impact would obviously be minimal at best. T18/7

In comparison, here are some statistics on the impacts energy efficiency and renewable resources have on both our economy and employment rates. Renewable resources have the advantage over fossil fuels in the employment sector. They can employ up to 5 times the number of people as can fossil fuels for every unit of electricity generated For every $1 million invested in energy efficiency and renewables, 20-30 job years are created. For example, the Luz company built four 80 MW solar thermal plants and generated approximately 500 job years. In operation, the plant still continues to provide more jobs than does a gas fired plant of equivalent size. T18/8

Clearly, a renewable plant can provide a local community with more employment opportunity, zero emissions and would create no upstream development impacts. I do not see such an alternative T18/9

anywhere within the Draft eis.

5.15 & 5.18 Significant Adverse Environmental Effects That Cannot Be Avoided and Cumulative Impacts

The Draft eis fails to take into consideration the entire range of cumulative impacts upon the environment that are associated with this project. Those that are addressed within the statement pertain only to localized impacts instead of those upstream effects that occur with the transport, processing and exploratory drilling of natural gas. These effects cannot be avoided and are significantly adverse. This is a grave oversight on the part of the authors who wrote the report. T18/10

I will limit my remarks to the effects on Canada's environment, as much of the gas we use in the United States comes from that country. As you are no doubt already aware, there is currently a burst of development in British Columbia and Alberta. Natural gas reserves are estimated at 4 trillion cubic feet (tcf) in Alberta and 10tcf in B.C. The pressure to exploit this resource is enormous and to date, the National Energy Board has never turned down a request for a permit to drill. However, evidence proves that this surge is not in either provinces' best interest.

*** 1/3 of all natural gas found in Canada is sour. This term is** T18/11

T18

used when the raw gas has a content of hydrogen sulfide (H2S), an extremely toxic substance, over 5 parts per million (ppm). H2S can be smelled at .02 ppm and at 5ppm, depending on provincial regulations, there are instant evacuation laws in effect for local communities. At 200 ppm you lose your sense of smell, at 500 ppm severe respiratory distress occurs which can cause permanent damage to the system, loss of reasoning and death within 4 hours of continuous exposure, and at only 1,000ppm, death is instantaneous.

In Calgary, Occidental Petroleum is seeking permits to drill just outside the city limits for gas that is 35% H2S. If a blowout should occur at any of the wells, the effect on a densely populated area would be deadly. T18/l2

*** Most of the estimated reserves are located in the Northern Rockies Ecosystem, a region that stretches from the border of Montana, continues up through Alberta and ends in the Northeast corner of British Columbia. This region is the habitat for a wide variety of wildlife including the endangered grizzly bear. By putting in seismic lines and cutting roads into the wilderness, gas companies are completely fragmenting and destroying the majority of the grizzly bear's habitat.** T18/l3

*** When the gas companies cut the first roads in a virgin forest, they are often followed by logging companies. Once these roads are in, it becomes economical and practical for clear-cutting to commence. Ironically, while the destruction of boreal forests that serves as a natural sink for the very pollutants that are emitted during the drilling, processing and combustion of natural gas is occurring, many companies consider "planting trees" a worthy mitigation measure What these misguided but doubtless well meaning corporations fail to realize is that no plantation can ever take the place of a forest whose K must remain intact.** 1~l4

These are only a few examples of the cumulative impacts that occur because of our expanding use of natural gas. There are many more equally substantial effects that were equally absent from the Draft eis.

In closing, I would like to make a few recommendations for the Final eis.

1. That your definition of cumulative impacts be broadened to include the upstream effects of processing, transportation and exploratory drilling of natural gas. T18/15

2. That the above impacts be considered and studied before making the final assessment on the Tenaska II Washington Generation Project.

4

3. That the section on global warming be broadened to include the recommendations made by the IPCC to reduce greeenhouse gas emissions by 60%. T18/l6

I cannot consider any eis, final or otherwise, complete without the consideration of the above comments. Cumulative impacts must include the effects this proposal has on the environment as a whole, not just our small portion of it. Global warming is not the insignificant issue this statement would have us believe; We must not respond to it by continuing to rely on fossil fuels as our main source of energy and ignoring the viable alternatives of renewables and energy efficiency. I urge you to take all these comments into consideration when writing the final report; indeed I firmly believe it is your responsibility to the citizens not only of this region, but also of Canada, to do so_

If you have any questions or would like further information, please do not hesitate to contact me. I can be reached at the regional office in Seattle at 206-632-4326. Thank you for your consideration.

Sincerely,

Sallie Schullinger
Greenpeace Energy / Climate Change Campaign

5

REBOUND
The Seattle/King County Building & Construction Trades Council

October 4, 1993 T18

Public Involvement Manager
Bonneville Power Administration
P.O. Box l2999
Portland, OR 97212

Dear Public Involvement Manager:

This letter is submitted in response to your request for comments on the Draft Environmental Impact Statement (Deis) for the proposed Tenaska - Washington II Generation Project. REBOUND is responding on behalf of its members who reside in the communities surrounding this proposed development and who will be affected by the impacts created by this project.

Specific Comments

AIR QUALITY
1. Cumulative air quality impacts are not evaluated in this Deis Pollution plumes from other nearby pollution sources, such as the Puget Power gas fired power plant, the Washington Natural Gas compressor station and other industrial activity either currently in operation, under construction or under permit review in the

T19/1

Frederickson area; must be overlaid with the pollution plume from the Tenaska

proposal to determine the cumulative localized air quality impacts from the operation of all the facilities. The potential for localized "hot spots" of high concentrations of criteria and/or toxic pollutants must be examined.

2. The DElS states that the project's air emissions of hundreds of thousands of pounds of pollutants annually will not be significant because the total will not exceed thresholds established by the Puget Sound Air Pollution Control Authority (PSAPCA) or similar federal Prevention of Significant Deterioration (PSD) thresholds.

Those PSAPCA and PSD thresholds, however, are designed to determine if the project's air pollution emissions merit a more detailed level of review for the Tl9/2
purposes of determining the conditions of its air permit, and are not designed for

2700 First Avenue, #103 Seattle, Washington 98121 1-800-244-9178 (206)441-7364 or 441-0455

Tl9

the determination of significant impact on air quality for the purposes of discussion T19/2
in an eis. Given the current air quality conditions for the proposed project area (non-attainment for CO and ozone), the definition of what constitutes a significant impact should be conservatively construed. Any contribution to already unhealthy air pollution levels should be characterized as significant, especially on projects T19/3
where large tonnages of additional pollutants are involved.

The following must be considered significant and the eis must contain an appropriate discussion:

A. Ozone--This plant will emit over 130 tons per year of ozone precursors NOx and VOCs) in an area that already has unhealthy ozone levels. Table 5.4-3 contains a "Note," which states, "NOx is not included because it is not currently considered to be an ozone precursor." Nitrogen oxides, however, react with hydrocarbon pollution and sunlight to produce low-level ozone. T19/4
This premise regarding NOx must be re-addressed in the eis.

. The Deis is deficient for not even mentioning NOx in the formation of ozone and completely omitted this in its Table 7-1. The emission of 98.9 tpy of NOx is nearly 99% of the PSD/PSAPCA threshold of 100 tpy.

. This plant will emit 37 tpy of volatile organic compounds (VOC), which is 93% of the PSD/PSAPCA threshold for this pollutant.

B. This plant will emit 91.2 tpy of CO, which is 91.2% of the PSD/PSAPCA threshold for this pollutant. Currently, air quality standards for this contaminant are in non-attainment for this area. The Deis fails to provide representative background levels of CO in Table 6-2. It also fails to address Tl9/5
how 91.2 tpy will not contribute to the already illegal levels of air pollution for this particulate.

C. No discussion is contained in the Deis regarding mobile sources (including truck traffic from suppliers and commuter traffic from plant employees) and construction equipment on the aggregate pollution T19/6
contribution of this project.

D. In addition, even by the Air Pollution Authority Standards, this project will emit a significant amount of SO2, according to Table 5.4-4, which shows an exceedance of the 3 hour and the 24 hour limit for SO2 emissions under certain conditions.

SO2 emissions from this project may also have a significant adverse impact on Mt. Rainier National Park. Table 7-4 shows a maximum SO2 impact at Mt. T19/7
Rainier of .4 ug/M3 as a 3 hour average, and .1 as a 24-hr. average. These

levels either exceed or approach the National Park Service's significance
T19/7
threshold for a 24 hr. SO2 average, which is .07, compared to the project's impact of .10, and for a SO2 3 hr average, which is .48, compared to the project's impact of .4. l

E. The facility will emit about 4 kilos/hour of VOCS. TAPs are a subset of VOCS. Table 5.4-5 of the Deis, a list of TAPS emitted by the project, accounts for less than 1 kilo/hour of these VOCs. The eis must explain what pollutants make up the other 2 kilo/hr of VOCS
Tl9/8

F. The Deis states on page 5-15, that the proposed facility will not contribute to a delay in the area's ability to attain compliance with PSAPCA's ambient air quality standards. There is no factual or analytical basis for this conclusion. However, the eis must address this project's contribution to the cumulative impacts and acknowledge that it will delay the area's ability to
T19/9
attain compliance with PSAPCA's standards.

3. This plant will emit over 50 tons per year (tpy) of PM-10 from its exhaust
stacks.
PM-10 is fine particulate that is capable of being drawn deep into the lungs and is highly damaging to human health.

Recently published studies2 demonstrate that PM-10 and total suspended particulate (TSP) are more harmful than previously considered. In one study of the Seattle area, days of high particulate concentrations in the air were correlated with increased hospital visits for asthma. In another series of similar studies, days of high particulate concentrations were correlated with days of high death rates in Santa Clara, California; Steubenville, Ohio; Birmingham, Alabama; and Philadelphia, Pennsylvania, among seven separate studies on this topic. Recently, particulates have been convincingly implicated in harm to pulmonary function.

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

It appears from these studies that any increase in PM-10 and TSP levels will cause an adverse health impact. This is a significant impact that should have been discussed
T19/10
in the eis.

A. The Deis fails to model 1-hr maximum concentrations of PM-10,
T19/ll

1 SO2 significance levels for the NPS taken from 5/20/91 letter from NPS to EPA' s Bill Lamason.
2 "Particulate Air Pollution and Hospital Emergency Room visits for Asthma in Seattle." Schwartz, Slater, Larson, Pierson and Koenig. American Review of Respiratory Diseases, v. 147, pp. 826-831. 1993

supplying 24-hr averages instead. We suggest 1-hr concentrations be modeled because of the serious implication of increasing already elevated PM-10 levels,
T19/ll
as shown by these recent studies.

B. In addition to the power plant exhaust, there are other sources of PM-10 and total suspended particulate (TSP) from this project which should be discussed in the eis:

. Construction will create about 1 ton of TSP per acre of disturbance per month. Given 7 acres of disturbance on the average, an additional 100 tons of TSP will be emitted during 15 years of construction.
T19/12

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

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

C. The Deis states that this project may need a burning permit from the Washington State Department of Natural Resources for elimination of site clearing debris. This proposed project, however, is located within the boundaries of PSAPCA's No-Burn Zone for residential and land clearing fires in the Puget Sound region. This should be discussed in the eis

T19/13

AMMONIA

The proposed power generation project will use, handle and transport large amounts of anhydrous ammonia. Table 5.9-1 indicates that anhydrous ammonia will be stored in a 12,OOO gallon tank at the plant site.

Ammonia is included in the EPA's list of extremely hazardous chemicals. It is highly toxic and can form a lethal ground-hugging cloud if spilled. Under certain conditions, it is highly explosive.

The proposed power plant will be located in a known earthquake high risk area which is rated as a seismic Zone 2. Possible earth shaking in the project area could occur (Deis p.4-3 and p. 5-4). These conditions compound the concern regarding the

T19/14

potential for an ammonia release.

1. The Deis states on page 5-17, that the proposed plant would "... emit some ammonia," but fails to provide information regarding amounts. This should be

T19/15

addressed in the eis.

2. The Deis states on page 5-17 that modeling utilizing the ISCST2 dispersion model on ambient ammonia concentrations resulting from plant operations was conducted. The eis should state the parameters and criteria upon which the models were based, including consideration of dispersion during poor air quality and

T19/16

temperature inversion conditions during the winter months.

3. The eis should contain an analysis of a worst case uncontrolled spill, including

T19/17

the amount of area that would be impacted by a deadly concentration of ammonia vapors the time required to reach those distances under worst case climatic conditions.

4. The cumulative impacts of this and other ammonia sources in the area which

T19/18

contribute to an ambient ammonia level should be included in the eis. The discussion should evaluate the possibility of the ammonia threshold being exceeded under adverse air quality mixing conditions. In addition to the computation of a 24-hour possible ammonia concentration that is contained in the Deis, the eis should also include a 1 hour, short term ammonia concentration created by the plant's emissions, in combination with emissions from other sources in the area.

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5. The Deis states that ammonia concentrations emitted at this facility will not be detectable as an odor. However, it also indicates that ammonia will be emitted at 10 parts per million (ppm). This area is in non-attainment for NOx and CO, which inhibits dispersion rates. The eis should correlate emissions, ambient concentrations and dispersion factors with an odor threshold.

T19/19

6. The Deis completely fails to address the conversion of ammonia emissions to the formation of NOx. There is evidence that ammonia released into the atmosphere

T19/20

quickly combines with other elements in the direct creation of NOx molecules. Thus, the release of ammonia at 10 ppm is synonymous to the emission of 10 parts of NOx per million parts of ammonia. This must be thoroughly addressed in the

eis, as well as the impact of ammonia emissions in relationship to the project's total NOx discharge, and a comparison to PSD/PSAPCA threshold limitations should be provided.

7. The Deis omits any consideration of the possible consequences of transporting, piping, storing and emitting hundreds of thousands of pounds of ammonia at this facility each year. Table 5.1-1 fails to include a reference to ammonia as a hazardous substance. Discussion under Impact HS3 is cursory, at best. There is no safety and control factor in Section 5.14, and there is no other discussion of ammonia contained in the Public Health and Safety section of the Deis. The eis for this project should include a full evaluation of ammonia impacts and mitigation measures, including, but not limited to, a risk analysis and an emergency contingency plan. T19/21

8. According to data analyzed from the U.S. Department of Transportation's

T19

Hazardous Material Incident Reporting System from 1982 to 1991, transportation related incidents involving spills of anhydrous ammonia were reported to number 584 nationwide. Two deaths were related to these incidents, as well as 81 injuries and 3,125 people were evacuated. ("America's Poisons on the Move". The Los Angeles Times. 9/20/92.)

However the Deis for this project does not compute the likelihood of a truck accident. There are no comments on the number of truck trips bearing ammonia, the possible size of any ammonia releases from a truck accident or the neighborhoods and businesses that would be threatened by a release. These must be addressed in the eis. T19/22

The eis should also detail the surface transportation routes along which tanker trucks delivering ammonia will travel, as well as alternate routes to minimize health and environmental hazards.

9. When spilled, anhydrous ammonia, a liquefied gas, turns very quickly into a gas that rapidly, in a ground-hugging cloud, travels downwind. Aqueous ammonia, a liquid solution, releases less gas into the air.

In 1991, Southern California Edison, in conjunction with California's South Coast Air Quality Management District (AQMD), conducted a study which concluded it would be safer to store ammonia in its aqueous form because it is a substantially lower risk. Edison's application for ammonia was precisely the same as that required for the Tenaska project proposal. Water was removed from the solution as it is being injected into the catalytic system. Subsequent to the study, the AQMD began to require the use of aqueous ammonia on all future selective catalytic systems.

To adequately address public safety concerns, the eis for this project should discuss the use of ammonia in its aqueous form, rather than anhydrous ammonia T19/23

The eis should also provide alternative ammonia storage methods.

10. The Deis fails to discuss a possible alternative project configuration that would include a NOx control system that does not use ammonia. There are several in the pollution control marketplace. T19/24

One procedure is known by the trade name SCONOx, for instance. EPA certified tests have show that this system can reduce NOx and CO emissions to below 2 ppm NOx and below .5 ppm of CO. It relies on oxidation and an adsorber system of specially designed carbon pellets and coated alumina beads (Journal of Commerce, July 16, 1993, p. 6B). An additional advantage to a system of this nature is that it does not produce a hazardous waste in the form of spent catalyst, as does the pollution control system proposed for the Tenaska project.

The eis should provide a thorough evaluation of such alternate pollution control technology.

WATER USE AND WASTE WATER DISCHARGE

1. The Deis states that the water use requirement for this project proposal will be 1.9 million gallons per day. However, in its application to the City of Tacoma Public Utilities, Tenaska indicates a peak day consumption of 2.25 million gallons per day, along with an additional 120,0OO gallons per hour for fire protection. The eis should indicate when these peak hour consumption requirements are likely to

T19/25

occur and the impacts to other users and rate payers.

2. The Deis also fails to place this extremely high water use in context. The Tenaska plant alone could use about 5% of the Tacoma Utility's water. It could use as much water as nearly 7OOO households of four.3 The eis should contain an analysis of the impacts that its water requirements will have on future development.

T19/26

3. This large water demand will require extensive construction by Tacoma Public Utility in order to service this proposed plant. The eis should analyze in detail the environmental impacts of this and other utility construction work, and outline the costs, the scope of work required, the sources of funding, and the impact to rate

T19/27

payers.

4 The eis requires a clarification regarding the disposition of the 100,000 gallons of

T19/28

process, cooling and sanitary waste water per day. Page 5-8 of the Deis states that it will be routed to the Pierce County sewage system while page 6-8 states that it will be discharged to the City of Tacoma's sewage system.

5. The eis must detail the pollution content of the waste water discharge for this project proposal.

6. There are indications that this discharge may not comply with laws and

T19/29

regulations, which prohibit discharges of cooling water into the Pierce County sewer system, as illustrated in the following memo:

> **"Non-contact once through cooling water is generally not allowed to be discharged to the sanitary sewer." (Memo from Pierce County Department of**

3 This is assuming Tenaska's maximum water use of 2.25 million gallons per day, taken from Tenaska's letter to Tacoma Public Utilities dated 5/6/93, and also assuming water use for a household of four as 348 gallons/day, which is taken from Standard Handbook of Environmental Engineering, McGraw-Hill, 1990, p. 5.l. In fact, since Tacoma households have cut their water use drastically because of recent drought, our estimate of Tenaska's water use vs. household water use may be conservative. We arrived at Tenaska using 5% of Tacoma's water by comparing the 2.25 million gallon per day (MGD) figure with Tacoma's average daily use, minus the demand of the Simpson Paper mill, which was a daily average of 45.44 MGD for "general" water use.

> **Utilities' Steve Thompson to Tacoma Utilities' Jane Evancho, September 22, 1993)**

The eis must explain how this conflict between the Deis declaration that cooling water will be discharged to the sewer and the applicable regulations which prohibit this type of discharge will be resolved.

7. The above quoted memo also states that most cooling water has inhibitor and algaecide chemicals added, but the Deis list of water treatment chemicals (Table 5.9-1) does not contain any reference to inhibitors or algaecides. The eis must provide detailed account of these chemicals and explain how they will be treated and

T19/30

ultimately disposed of.

8. The eis must provide the status on the litigation by Washington State Department of Ecology and the Environmental Protection Agency against the City of Tacoma sewage treatment system regarding its non-compliance with biological

T19/31

oxygen demand requirements and how this proposed facility's waste water discharge

will impact this situation.

9. Pierce County has experienced ongoing problems regarding the accumulation of metal pollutants in its treatment plant sludge. The Federal EPA has, in the past, submitted strong objections to the County regarding this sludge and has threatened to hold up issuance of new water permits to the County over this and other issues.

The eis must address the potential impacts that this proposed project will contribute
T19/32
to the Pierce County facility.

10. The hookup of the proposed Tenaska facility to the County sewer system will require a large capital expenditure by the County. The eis must explain these costs, the needed infrastructure improvements, and the possible impacts on other rate
T19/33
payers.

11. Despite the serious threats to the County's current aquifer status, this project will add a very large demand on the City's water supply. This urban area is on the verge of requiring additional well drilling and the possible drawdown of this sole source aquifer, even without this project proposal (Deis p.4-44). This very large water demand may hasten the depletion and/or degrading of the aquifer. The eis
T19/34
should analyze this issue.

12. Regarding the current City well system, well 12-A is a Superfund site, and 4 other city wells (2-B, UP-10, Tide Flats, and Dash Pt.) have all been tested as exceeding the maximum contaminant level for one or more pollutants in their water. The eis must fully discuss this concern regarding the area's present and
T19/3S
future water supply.

GROUNDWATER

1. The underlying soils are extremely permeable, meaning any release of
T19/36
objectionable substances would be rapidly conveyed into the groundwater (Deis, p.4-4). This is a potentially serious problem since the County derives the majority of its drinking water from the aquifer, which is awaiting classification as a sole source aquifer, and is already designated as a Groundwater Management Area (sections 4-6 to 8).

There is no discussion of the use of separators or other treatment measures in the Deis under Impacts HY2 and HY3. The eis should contain greater detail regarding
T19/37
mitigation plans, rather than simply state that various actions "could" be taken.

GLOBAL WARMING

1. The Deis fails to discuss the possible contribution of this plant's massive steam
T19/38
discharges to global warming. Heated water vapor is widely recognized as a contributor to the global warming problem (California Energy Commission, 1991).

2. Tenaska proposes to mitigate only from 7 to 50% of the CO2 emitted by this project, and fails to enumerate the sequestration methods. The eis should also state whether Tenaska plans to mitigate the emissions of other gasses which contribute to
T19/39
global warming, such as its criteria pollutants and its heated water vapor. If such mitigation is planned, the methods to be used should be presented and discussed.

EROSION AND RUNOFF

1. Erosion from 7.2 or more acres of cleared, bared ground can be a significant problem during the 1.5 year period of construction. Over one million gallons or rain may fall on this exposed site in an average November alone.4 So called "standard" erosion measures such as silt fencing, straw bales, and temporary seeding are suggested. During construction, equipment may be tarped, supplies kept in covered areas, and fuel and oil stored in above ground tanks over impermeable surfaces.

However there is no discussion in the Deis of how these theorized mitigations will be enforced at the construction and production jobsite, nor is there discussion of the

T19/40 efficiency of these purported methods, or discussion of more efficient alternatives, in the face of this very large rainfall. These factors must be fully analyzed in the eis.

T19/41 2. Erosion may not create mud slides at this site, but the eis must include a discussion regarding the potential for the deposition of solids as silt is washed from the project site into normally permeable soils due to erosion.

T19/42 3. The Deis does not describe the status of the project application for a stormwater

4 7.2 acres times 326,000 gallons per acre foot times .48 foot (5.7 inches is the average rainfall in November, 4-9)

T19/42 NPDES permit, nor does the Deis provide information regarding the typical conditions of a stormwater NPDES permit for this type of facility. The stormwater NPDES may allow a certain amount of degrading of groundwater quality. Stormwater NPDES conditions should be described in the eis so that the public can ascertain the permitted adverse impacts from stormwater runoff.

4. The Deis claims that stormwater from the site will be discharged to the surface through a roof drain infiltration system, a fuel oil storage area infiltration system, and a bioswale and retention-infiltration pond for the rest of the site.

T19/43 This configuration of stormwater management has several negative implications which are not discussed in the Deis:

. If the fuel oil storage area is connected to an infiltration system, then any leaks from the fuel oil tanks could be released to the surface.

. Contaminants, such as oil spills from the fuel oil storage area, debris from the project roofs, and oil, grease, and solvents from vehicles or maintenance activities conducted on the remainder of the site, may all be discharged to the surface through the proposed stormwater management plan. The Deis does not contain an adequate discussion regarding treatment systems for oil and

T19/44 grease from this site (Deis P.5-8).

. There is no mention of special runoff handling considerations hr

T19/45 areas containing toxic materials, such as ammonia.

. Since the stormwater would be channeled to a small area for discharge, there would be a resulting concentrated, swift flow to this spot, thus increasing the downward flow to groundwater, as opposed to having this flow diffused over

T19/46 a large area and the slow infiltration which occurs under natural conditions. If there is a concentration of this runoff, there may not be an attenuation of contaminants in the vadose zone.

An eis for this proposed project is incomplete without a thorough evaluation of the above concerns.

T19/47 5. The Deis suggested that an impervious liner will be placed in the bioswale. This liner could not be totally impervious; otherwise there would not be seepage from the swale into the groundwater at all. The eis must contain a clarification and an engineering description of this liner.

HAZARDOUS WASTE

1. Hazardous wastes have been found at sites and in groundwater very close to the location of the proposed power plant (within one mile). Nearby land uses include industrial and manufacturing facilities which utilize a variety of hazardous waste

substances, such as solvents, metals, arsenic, oils, and possibly PCBs. These facilities include a power plant, substation, compressor, a refined petroleum products pipeline and natural gas line, wood products facilities, The Boeing Company, a plastics composite plant, and truck and rail traffic.

Because this site is located within an industrialized area, toxic materials may have been dumped there, or transported to this property by wind and water movement after nearby spills and releases. A Tacoma Utility official has stated there was a toxic spill near the plant site in the last year.

The Deis provides little indication of site examination, other than a brief document review. The eis must provide results of tests conducted on soil and groundwater samples, as well as detailed results of the groundwater monitoring wells adjacent to this site (Deis pp. 4-34, 6-10). T19/48

2. The Deis noted that the existing area landfill is operating under a 5 year extension, which is due to expire in 1996, or about the time this power plant comes on line. The eis should describe the destiny of the various solid wastes generated by this project subsequent to 1996, including but not limited to the waste catalysts from the pollution control devices, which may contain hazardous metals. T19/49

3. This plant will use a demineralizer, which may generate waste materials. The device is not described in the Deis and its waste stream is not estimated and characterized (Deis p.5-47). This must be detailed in the eis. T19/50

LEGIONNAIRES DISeaSE

The Deis table of materials stored on site did not list any biocides known to be effective against Legionnaires Disease. This disease breeds in moist, warm climates, including cooling towers such as those to be used in this project proposal. This disease has been known to spread through the discharge of steam from cooling towers.5 The eis must identify and describe the use of appropriate chemical treatment of its cooling tower system to stifle development of the relevant bacteria T19/51

HAZARDOUS MATERIALS

The Deis mentions a chemical called DCL 500 that is used during placement of underground power lines. Greater description of the composition and effects of this chemical is needed in the eis, including a reproduction of the MSDS for DCL 500, so that the public can evaluate any threat from this material. T19/52

5 "Legionella in Power Station Cooling Waters." Bonnell and Rippon Lancer August 10, 1985. pp. 327-8.

"Prevalence of Antibodies to Legionella Pheumophia Among Workers Exposed to A Contaminated Cooling Tower". Buehler, Kurritsky, Gorman Hightower and Broome. Archives of Environmental Health. July/August 1985. pp 207-10.

HABITAT MITIGATION

The Deis fails to describe possible mitigation measures for the destruction of potentially critical Oregon oak stand habitat (4-16). The eis should describe the status of the Pierce County and Washington Department of Wildlife (WDW) review of these oak stands, and list several potential mitigations to be provided by the T19/53

developer for the loss of these trees. The eis should also reference WDW's most recent endangered and threatened species list and state the presence of any habitat
T19/54
that potentially will be impacted by this project proposal

TRAFFIC MITIGATION
The construction and operation of this facility will increase already congested traffic in the nearby area. (Deis; p.4-41). There is currently an "E" traffic level of service
in
this area, which is characterized as "intolerable delay." The eis must discuss the proposed projects contribution and impact on these already intolerable levels, both
T19/55
during construction and operation phases. The eis should address alternative mitigation measures, such as road improvement, additional mass transit, and car pooling assistance. If one mitigation includes the payment of mitigation fees to Pierce County, the eis must outline how these fees will be applied.

SOCIO-ECONOMIC IMPACTS
The eis should contain a discussion of socio-economics, which should consider the impacts of this proposed project on human issues, both during the construction and operational phases, and should include, but not be limited to: the availability of housing for temporary workers; the ability of communities to provide services
T19/56
(social, health and emergency services) and estimated mitigation fees; whether workers will be hired locally or from out of state; whether or not workers will be paid area standard wages and benefits; and the fiscal impacts to the communities and to the State of Washington.

The eis should address this project's implementation of best available control technology and construction techniques in order to assure public health and safety
T19/57
and the mitigation of environmental impacts. Quality control is a factor of employing workers who are highly trained, skilled and reliable. The eis should address whether or not workers who have been trained through Washington State
T19/58
approved apprenticeship programs will be employed in the construction of this project.

POWER LINE ALTERNATIVE
The alternative of burying power lines associated with this project should be
T19/59

T19
selected

ALTERNATIVE TECHNOLOGIES
The following technology alternatives have not been addressed in the Deis. A thorough evaluation should be conducted and a discussion presented in the eis. Given the potential human and environmental benefits of employing these technologies in this project proposal, it would be totally insufficient to disregard consideration of these processes as unfeasible. Rather, an extensive environmental benefit and resource preservation analysis should be presented and weighed against the economic impacts to the project.

1. Air Cooling Alternative. This alternative configuration would mitigate the global warming, water use and water discharge impacts of this project proposal.

There are several power plants, including two plants currently in operation and one that is permitted and under construction, in Wyoming, and one operating plant in South Africa, which use extensive air cooling mechanisms to recondense their steam back into water for reuse in their power plant cycle.

Tenaska's water usage could be reduced through the installation of an air cooling system as an alternative to simply discharging steam into the open air through
T19/6O
cooling towers.

2. Water Recovery Alternative. This alternative would follow the example of an operating power plant in Rhode Island that treats and reuses its blow-down water,
T19/61
rather than discharging this as effluent. If this alternative configuration for the handling of blowdown water were installed at this proposed project, considerable

water could be saved and effluent reduced.

This water would then be available for re-use in the plant, or for recharging the aquifer.

COGENERATION ALTERNATIVE
The Deis fails to discuss any reason why the Tenaska power plant could not be sited next to an industrial host which would serve as a customer for this plant's spent

T19/62

steam. If the Tenaska II Generation Project was to pipe its steam to an industrial facility, after utilizing the steam to spin its turbines, that steam customer facility would be able to use the steam (which is currently proposed to be released into the atmosphere) for its production or heating processes. That facility's boiler operation would be curtailed, thus creating an environmental benefit.

In fact, Tenaska's current power plant at the British Petroleum refinery near Ferndale, is a cogeneration facility. This demonstrates that cogeneration is a feasible and economic technology in the Northwest region for this particular developer.

13

T19

The Deis, however, does not present an alternative configuration of this project, involving a different site for the plant that would allow it to be a more efficient,

T19/63

environmentally beneficial cogeneration facility. This is a major flaw which should be overcome in the eis. Discussion of project alternatives, such as an alternative cogeneration site, is the heart of the eis process.

REBOUND appreciates the opportunity to comment on this Deis. Please continue to send REBOUND copies of further environmental documents and notices of public proceedings regarding this project.

Sincerely,

Otto W. Herman, Jr.
Director

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afl-cio

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T19

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Bonneville Power Administration
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SUBJECT: Tenaska Washington II Generation Project Draft Environmental Impact Statement

Dear Ms. Baker:

We appreciate the opportunity to review and comment on the Tenaska Washington II Draft Environmental Impact Statement. First, a few general comments on the Draft Environmental Impact Statement.

The discussion on NPDES should be updated for recent events. Tenaska filed a Notice of Intent for coverage under the Storm Water Baseline General Permit with the Washington Department of Ecology on August 2, 1993. After a review of the application the DOE
T20/1
determined that the operation of our facility will not require an NPDES storm water permit. Attached is the DOE response of August 30, 1993 discussing the NPDES. Tenaska will apply for a construction permit prior to the start of construction.
T20/2

It should be noted that the Tenaska Washington II project is specifically included in the
Comprehensive Plan Draft for Pierce County, June 1993.
T20/3

The following are comments on specific items in the Draft eis:

First Page Para Abstract

"The plant would be developed, owned and operated by Tenaska Power Partners, Inc" "Tenaska Power Partners, Inc." should be changed to "Tenaska Washington Partners II, L.
T2O/4
P." This change should be made throughout the document. Tenaska Washington Partners II, L.P. is the entity named in the Power Agreement attached to the Letter of Intent between Bonneville Power Administration and Tenaska Power Partners, L. P.

T20

Pg 5-6 Section 5.3.2

The description of the fuel oil drainage system in the third paragraph could be clarified by
noting that the fuel oil storage area will be lined with impervious material and bermed.
T20/5
Precipitation from this area will be checked for oil content and either routed to the oil-
water separator, if necessary, or to the bioswale and infiltration pond for disposal.

Pg 5-8 Impact HY2

The following statements should be added: "The waste water discharge meets all of the volume and effluent quality requirements of the Pierce County Utilities Sanitary Sewer
T20/6
System. No need was found for additional waste water treatment or volume reduction through evaporation or reverse osmosis processes."

Pg 5-10 Section 5.4.2 Para 3 and 4

The following statement should be added: "Tenaska's air permit application was reviewed
T20/7
by PSAPCA and submitted for agency and public comment on August 11, 1993. No comments was received by PSAPCA." (Jay Willenburg, PSAPCA, pers. comm, September 15,1993).

Pg 5-26 Impact BR4

T20/8
It should be noted that this impact applies to the gas line, water line and sewer line corridor also.

Pg 5-32 Para Impact SE2

T20/9 **It should be noted that the $1 million for property taxes and $1 million for a state gas use tax are annual amounts.**

Pg 5-45 Para Impacts

T20/10 **The second sentence gives the impression that the power generated would vary by time of day and the amount of staffing. It should be noted that the plant will operate near capacity whenever it is running and that the output is not a function of the manpower on site.**

T20

TENASKA

Comments on Draft eis
October 1, 1993
Page 3

Pg 5-64 Section 5.17

Although the amount of resources consumed over the life of the project cannot be accurately determined at this time because the total operating days cannot be determined it can be noted that the project will used approximately 45 million cubic feet of natural gas per day and approximately 1.8 million gallons of water per day.

Pg 6-11 Section 6.17 Permits

The list of permits should be expanded to include:

Review per Section 309 of the Clean Air Act by the Environmental Protection Agency

Industrial Waste Discharge Permit from the Washington Department of Ecology

Natural Gas Import Authorizations from the Federal Energy Regulatory Commission

Determination of Exempt Wholesale Generator from the Federal Energy Regulatory Commission

Critical Area Review by Pierce County

Thank you for this opportunity to comment on this document. Please feel free to call me with questions regarding these comments.

Sincerely,

Thomas E. Hendricks
Vice President

Attachment

9310013a.b

T20

STATE OF Washington

DEPARTMENT OF ECOLOGY

P.O. Box 47600 Olympia, Washington 98504-7600 (206) 469-6000

August 30, 1993

Mr. Michael C. Lebens
Tenaska Washington Partners II, LP.
407 N 117th St
Omaha, NE 68154-2570

Dear Mr. Lebens

RE: Notice of Intent (NOI) for Coverage Under the Storm Water Baseline General Permit

Facility\Site Name: Frederickson Generation Project
Address: Tacoma, WA

The Washington Department of Ecology has reviewed your application (NOI) for coverage under the Storm Water Baseline General Permit. Based upon our interpretation of federal regulations, your facility/site is not required to apply for coverage for the reason(s) indicated below:

The operations of your facility will not require an NPDES storm water permit. However, if more than five acres is disturbed during construction, a notice of intent for construction activity must be submitted to the Department of Ecology 30 days prior to the start of construction.

Regardless of our interpretation, if you wish to have your facility/site covered under the permit, please notify us by letter, or call (206) 438-7614.

Unless you contact us at the above telephone number, we will consider your application withdrawn. Please be aware that you are still responsible for compliance with other water quality laws and regulations, such as Water Quality Standards. Therefore, you should take reasonable measures to reduce the potential for surface water or ground water pollution caused by your facility/site.

If conditions at your facility/site change (for example, a change of primary industrial activity), you should re-evaluate whether you need to apply for coverage under this permit.

T20

Please call us at the same telephone number listed above if you have any questions.

Sincerely,

Edward O'Brien, Supervisor
Industrial Storm Water Unit
Water Quality Program

Enclosure

T20

NOTICE OF INTENT
For Baseline General Permit to Discharge
Storm Water Associated with
INDUSTRIAL ACTIVITY

(Please print in ink or type)

I. OPERATOR

Name
Tenaska Washington Partners II, L.P.

Mailing Address
407 North 117th Street

City | Zip + 4
Omaha, Nebraska | 68154-2570

Contact Person | Phone No.
Michael C. Lebens | (402)691-9515

II. OWNER/REPRESENTATIVE OF FACILITY

Name
Same As Operator

Mailing Address

City | Zip + 4

Contact Person | Phone No.

III. FACILITY ADDRESS

Facility Name
Fredrickson Generation Project

Street Address

City | Zip + 4 | Phone No.
Tacoma

County

Legal Description (if not address for site)
Parcel 60-3, Fredrickson Industrial Area, Pierce County, Washington

IV. Billing Address

x Owner _ Facility
_ Operator _ Other (below)

Name
Same As Operator

Address

City | Zip + 4 | Phone No.

V. RECEIVING WATER INFORMATION

A. Does your facility's storm water discharge to (check all that apply)
1. _ Storm sewer system: name of storm sewer system (operator): _____
2. _ Directly to surface waters of Washington state (e.g. river, lake, creek, estuary, ocean)
3. _ Indirectly to surface waters of Washington state
4. x Directly to ground waters of Washington state: _ dry well x drainfield _ other

B. Name(s) of receiving water(s): _____
_____
Initial discharge is to an unnamed receiving water? _ Yes _ No

C. Location of Discharge(s):
Quarter _sE_ Section _36_ Township _19 North_ Range _3 East_

VI. INDUSTRIAL ACTIVITY INFORMATION

A. SIC Code(s) (Post PRIMARY SIC in No. 1)
1. 4911 2.____ 3. ____ 4._____

B. Type of business
Electric Power Generation

C. Areas with industrial activities at facility: (check all that apply)

1. _ Manufacturing Building
2. x Material Handling
3. x Material Storage
4. _ Hazardous Waste Treatment, Storage, or Disposal (Refers to RCRA, Subtitle C Facilities Only)
5. x Waste Treatment, Storage, or Disposal
6. x Appl. or Disposal of Wastewaters
7. x Storage & Maint. of Material HandEng. Equip.
8. _ Vehicle Maintenance
9. _ INACTIVE Areas Where Significant Materials Remain
10. x Access Roads & Rail Lines for Shipping & Receiving
11. x Other Steam and Power Generation

Additional Information Needed:
Total size of site with industrial activity (in acres) __9__
Total impervious area (including rooftops) (in acres) _2.5_
Has a storm water pollution prevention plan been developed? (Preliminary) x Yes
Are storm water discharge data available? x No
Are data available on impact of storm water on water quality or sediments? x No

I. MATERIAL HANDLING/MANAGEMENT PRACTICES
Types of materials handled and/or stored outdoors: (check all that apply)

1. _ Solvents	4. _ Plating Products	8. _ Paints/Coatings
2. _ Scrap Metal	5. _ Pesticides	9. _ Woodtreating Prod.
3. x Petroleum or Petrochemical Products	6. _ Hazardous Wastes	10.x Other Toxics(list) Anhydrous Ammonia
	7. x Acids or Alkalies	

Identify existing management practices employed to reduce pollutants in industrial storm water discharges: (Check all that apply)

1. x Oil/Water Separator	4._surface Leachate Collect.	8. x Infiltration Basins
2. x Containment	5. x Overhead Coverage	9. x Operational BPMs
3. x Spill Prevention	6. _ Recycling/Source Reduction	10._ Vegetation Mgmt.
	7. x Detention Facilities	11. x Other (List) Biofiltration Swale

VIII. REGULATORY STATUS (check all that apply)

A._ NPDES Permit **C.x Air Notice of Construct., Permit, or Order**
Permit No._____ **Agency: Puget Sound Air Pollution Control Agency**

B._ State Waste Discharge Permit **D. _ State/USEPA Hazardous Waste ID No.**
Permit No. _____ **_____**

IX. STATE ENVIRONMENTAL POLICY ACT (SEPA) (Applies only to NEW INDUSTRIAL FACILITIES)

Has SEPA review been completed? _ Yes x No _ Exempt
Agency Issuing DNS, Final eis, or Exemption: Bonneville Power Administration & Pierce County
Date of DNS or Final eis: Anticipated - March 1994

X. PUBLIC NOTICE (Applies only to NEW INDUSTRIAL FACILITIES)
Attached affidavit of TWO publications? _ Yes x No

XI. CERTIFICATION OF PERMITTEE(S)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Tenaska Washington Partners II, L.P.
By: Tenaska Washington Partners II, L.P. Managing Partner
By: Tenaska II, Inc., Managing Partner

Operator's Printed Name: Michael C. Lebens **Owner's Printed Name: (If Co-Permittee)**
Signature: _____ **Signature: _____**
Title: Vice President Date: 8/2/93 **Title: _____ Date: _____**

Tacoma Public Utilities

Mark Crisson
Director

3628 South 35th Street
P.O. Box 11007
Tacoma, WA 98411-0007

Divisions
Light
Water
Belt Line

October 4, 1993

Public Involvement Manager
Department of Energy
Bonneville Power Administration
P. O. Box 12999
Portland, OR 97212

Dear Sir:

**SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT
TENASKA WASHINGTON II GENERATION PROJECT**

Both Light and Water Divisions have reviewed the subject request.

The Light Division has replied under separate cover on October 1, 1993. The Water Division has no comments.

Sincerely,

**Richard W. Curtice
Real Estate Management Supervisor**

RWC/cjk

T21

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

**REPLY TO
ATTN OF: WD-126**

OCT 4 1993

**Lynn W. Baker
Acting Public Involvement Manager
P. O. Box 12999
Portland, Oregon 97212**

Re: Proposed Tenaska - Washington II Generation Project Draft Environmental Impact Statement (eis)

Dear Ms. Baker:

The Environmental Protection Agency (EPA) has reviewed the Proposed Tenaska - Washington II Generation Project Draft eis. The Draft eis evaluates the proposed development of a privately-owned 240 megawatt gas-fired combustion turbine power generation plant in Pierce County, Washington. The Bonneville Power Administration (BPA) would purchase electrical power from the proposed facility. Our review of this proposal is conducted in accordance with the National Environmental Policy Act (NEPA), and BPA's authorization under Section 309 of the Clean Air Act to comment on the overall environmental acceptability of federal actions subject to NEPA.

Resource acquisition program alternatives were previously evaluated by BPA in the 1993 Resource Programs eis. The alternative identified in the Record of Decision for that eis was "emphasize conservation", under which one-third of the future power acquisitions would come from combustion turbines. The Tenaska project, evaluated in the subject Draft eis, would provide one quarter of the total acquisitions from combustion turbine projects.

The principal environmental issues associated with the proposed Tenaska project, about which we are providing comments, below, are impacts to air quality and ground water resources. The project's air emissions will cause an incremental cumulative impact to air quality, and the possible infiltration of pollutants from the project site during construction and operations may ultimately impact ground water resources. We have requested additional information to assist in the assessment of

those impacts.

Air Quality

As indicated in the Draft eis, the project area is not in compliance with the ambient air quality standards for carbon monoxide (CO) and ozone. Both CO and volatile organic compounds

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T22

2

(a precursor to ozone) emissions are subject to the significant impact threshold criteria for new sources in a non-attainment area, administered by the Puget Sound Air Pollution Control Agency (PSAPCA). The air quality impact analysis indicates that these project emissions will approach (but not exceed) the - applicable thresholds (Draft eis, page 5-13 and Table 5.4-3).

The Draft eis indicates on pages 5-15 and 5-16 that the proposed Tenaska project is not subject to the Prevention of Significant Deterioration (PSD) regulations because the project will not have the potential to emit more than 100 tons per year of any air pollutant. This is not entirely correct since, the project does have the potential to emit over 100 tons per year of nitrogen dioxide, which would normally make this project subject to PSD review. However, in this case, because the project is defined as a "synthetic minor", and is subject to federally enforceable permit conditions, it will not be subject to PSD review.

Sulfur dioxide concentrations (3 hour and 24 hour) from the project also approach the ambient standards thresholds (for attainment pollutants), as indicated in Table 5.4-4 of the Draft eis. Although regulatory public health standards would not be exceeded by the proposed project, the project, as a result of the above and other emitted pollutants, will be a contributor to overall cumulative air pollutant emissions in the affected airshed. The Final eis should describe the cumulative air quality impacts of the proposed Tenaska project and the existing power plant in the vicinity of the project site. This information can probably be obtained from the PSAPCA permit application.

The Final eis should reflect the latest emission limits and requirements of PSAPCA included in the air permit issued for the proposed project. Emissions should be stated in terms of "potential" emissions as opposed to annual averages.

An inconsistency appears in the Draft eis between page 5-10, and Table 5.4.2 in reference to the number of "hours" vs. "days" fuel oil would be utilized (should apparently be 120 hours).

Ground Water

The Draft eis indicates on pages 4-7 and 4-8 that a petition for designation of the Clover-Chambers Creek Basin aquifer system (within which the proposed project site is located) as a Sole Source Aquifer has been submitted to EPA. The designation currently under review covers the larger area encompassing the Central Pierce County Aquifer System. We expect a final decision on that designation next month.

T22

3

Page 4-8 of the Draft eis states that EPA review (i.e., under the Sole Source Aquifer program) of the project is required since BPA is "considering purchasing power from the proposed project." If a sole source aquifer designation is approved, EPA may review and comment on the project pursuant to Section 1424(e) of the Safe Drinking Water Act. If EPA does review this project, we would want to review the prevention, contingency, and spill response plans listed at the top of page 6-8, as well as the storm water plan. More information on these controls should be reflected in the Final eis as discussed below.

Page 4-8 contains a factual error in the second to last sentence of the first paragraph. The July 1993 event that was noted was not a public hearing, but rather an informational meeting. Official public comments were not formally taken as indicated.

Water quality impacts are discussed on pages 5-6 through 5-9 and pages 5-34 through 5-38 of the Draft eis. As indicated in the Draft eis, the soils of the site are highly permeable. This raises concerns about the potential for ground water contamination resulting from the infiltration of contaminants associated with plant construction and operation: a discussion of these potential impacts should be included in the Final eis.

A National Pollutant Discharge Elimination System permit from the Department of Ecology will be required for storm water discharges. Adverse impacts to the underlying aquifer should not occur if all federal, state, and local regulatory measures are implemented regarding storm water management, storage of hazardous wastes, and disposal of wastewater to the sewer system The Draft eis provides little detail on those mitigation measures and design features, thereby precluding a complete assessment of their effectiveness. The type of information required to support the National Pollutant Discharge Elimination System application, including storm and process water flow schematics and control measures and best management practices should be reflected to the extent possible in the Final eis.

Construction and operational-phase measures to prevent and clean up spills of petroleum products and chemicals should be better documented and stated as commitments in the Final eis. The Draft eis indicates that a Spill Prevention Containment and Countermeasures (SPCC) could be instituted. The SPCC plan, if not included in the Final eis, should be better described, as should the Resource Conservation and Recovery Act procedures which will apply to the proposed project All measures necessary to prevent potential adverse impacts to ground water resources should be stated as management commitments.

T22

4

Based on our review we have rated the Draft eis EC-2 (Environmental Concerns-Insufficient Information). An explanation of EPA's eis rating system is enclosed for your reference. To summarize, the primary basis for our concerns is the incremental regional impact of project-related air emissions and the potential (i.e., subject to implementation of appropriate mitigation) for infiltration of pollutants at the site during construction and operations. The additional information we have requested in our comments would further assist in the assessment of those impacts. A summary of our comments will be published in the Federal Register.

Thank you for the opportunity to review the Draft eis. We would be pleased to provide assistance in addressing our

comments. Rick Seaborne in the Environmental Review Section is the lead contact person for this review and can be contacted at (206) 553-8510.

Sincerely,

Kathy Veit, Chief
Program Coordination Branch

Enclosure

T22

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

Environmental Impact of the Action

LO - Lack of Objections

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

EC - Environmental Concerns

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

EO - Environmental Objections

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

EU - Environmental Unsatisfactory

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

Adequacy of the Impact Statement

Category 1 - Adequate

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

Category 2 - Insufficient Information

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

Category 3 - Inadequate

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

From EPA Manual 1640 policy and Procedures for the Review of Federal Actions Impacting the Environment.

T22

5

CONCURRENCE PAGE

Subject: Tenaska project Deis

bcc: Author File - Seaborne
Reading File
official File
HQ - OFA
Ray Nye - AT-082 .
Scott Downey - WD-133

Date: 9/30/93
WordPerfect 5.0
File Name: F:\USER\FSeaBORN\TNSK.DEI
New Addresses:

.

CONCURRENCES

SURNAME	**Seaborne**	**Acting Sec.Chf**	**Veit**
INITIALS	**PS**	**PS**	
DATE	**9/30 ---**		

KEEP WITH OFFICIAL FILE COPY

T22

EDS
Economic Development Board
for Tacoma-Pierce County

September 23, 1993

Lynn W. Baker
Acting Public Involvement Manager
Bonneville Power Administration
P.O. Box 12999
Portland, OR
97212

Subject: Comments on the Tenaska Washington II Generation Project Draft eis

Dear Ms. Baker,

The mission of the Economic Development Board of Tacoma-Pierce County (EDB) is fairly obvious from our name. The EDB is a partnership between private business and the public sector with a goal of increasing the quality and number of jobs as well as spurring capital investment within the county. Retention of existing jobs and businesses is likewise an important facet of our activity. The EDB believes that the Tenaska power generation project proposed for the Frederickson area of Pierce County would be an important addition to the county's infrastructure and will contribute to continued development of our area. Our support of this project is based upon the following specific reasons.

1. The Region Needs New Electrical Power Generation

All forecasts of the electrical load compared with the generating capacity (load/resource balance) indicates that the Region is already short of power in the current year. Requirements to reserve water for the Endangered Salmon will exacerbate this imbalance. BPA has sought projects that will generate 300 average megawatts of energy. The Tenaska project is expected to generate 240 T23/1 average mega watts. Failure to provide for continued growth of electrical demand is a recipe for economic stagnation.

2. The Project Will Reduce the Voltage Sag Issue in the Puget Sound Basin

The majority of the electric power users in the State are located on the West side of the Cascade Mountains, yet most of the generating resources are in Eastern Washington. This load/resource distribution pattern requires an extensive set of power transmission lines to be run across the mountain passes to support the electrical load. Previous studies have shown that failure of one or more of these lines during the peak winter demand period (also the most likely time for a winter storm capable of damaging the lines) would result in a serious power disturbance in Puget Sound with possible "brown outs". This issue is serious enough that many of the West Side Utilities have put emergency plans into place to curtail industrial and other business activity on an instant's notice to preserve the electrical system stability.

950 Pacific Avenue * Suite 410 * P.O. Box 1555 * Tacoma, WA 98401
PHONE (206) 383-4726 * FAX (206) 383-4676

T23

Bonneville Power Administration September 23, 1993
Comment on Tenaska Power Generation eis

Of the alternatives available to address this issue, increasing the electrical power generation near the load centers is the most effective. The proposed Tenaska plant located at Frederickson is in the center of the area that uses most of the power. Power generation at this location will be a very T23/2 significant contribution in limiting the potential voltage sag and the economic curtailments that would result from a transmission line failure. Moreover, building the Tenaska project may allow the delay of other means of addressing the voltage issue that have more serious environmental damage potential.

3. The Project will Generate Construction and Permanent High Quality Jobs

The proposed construction schedule will generate 225 to 250 jobs over an 18 month period. Most of these jobs will come from the local area. Companies that furnish trucks, backhoes, bulldozers, cranes and other heavy equipment are likely to benefit. Workers skilled in welding, steel rigging, concrete pouring, wiring, and instrumentation will be required. These are high paying, high quality jobs, the kind that any community would seek.
T23/3

The permanent jobs in the operating plant are also of a highly skilled variety with relatively good salaries. Therefore from a community point of view, both the construction and the on-going plant operation will provide high quality jobs that are capable of supporting families.

4. The Project will have a Minimal Environmental Impact

The Frederickson site is intended for industrial development. There is an existing Puget Power electrical generating plant located within 600 meters of the proposed site. There are existing high voltage transmission lines and a major electrical Switching Station within 500 meters of the location. It would be hard to find a more ideal site for the project.
T23/4

During operation, only 14 people will be at the site during the peak activity hours, which is expected to be on the day shift. On the off-shifts only a handful of people will be on the site. Traffic-loading is expected to be trivial, especially since it will be dwarfed by the already approved Boeing plant next door. The project meets all environmental requirements and has gone through an extensive BPA screening of the potential generation project candidates.

Therefore we at the EDB strongly endorse the construction of the Tenaska Washington II project T23/5 located at Frederickson. Thank you for this opportunity to comment

Sincerely,

Erling O. Mork
President

Economic Development Board of Tacoma-Pierce County
Page 2

T23

NORTHWEST POWER PLANNING COUNCIL
851 S.W. SIXTH AVENUE, SUITE 1100
PORTLAND, OREGON 97204-1337

Phone: 503-222-5161
Toll Free: 1-800-222-3355
FAX: 503-795-3370

October 4, 1993

Ms. Lynn W. Baker
Acting Public Involvement Manager
Bonneville Power Administration
P.O. Box 12999
Portland, Oregon 97212

Dear Ms. Baker:

We appreciate the opportunity to review the Draft Environmental Impact Statement for the Tenaska Washington II Generation Project.

Important environmental issues associated with this project include cumulative air quality effects, risks associated with hazardous materials, noise, release of greenhouse gasses, and possible environmental consequences of the interaction of this project with the balance of the regional power system. While all environmental impacts of potential significance should be identified in the environmental impact statement, we believe that it is particularly important that the key issues be highlighted and receive comprehensive, in-depth assessments. Several of the comments that follow are intended to highlight environmental issues we believe to be among the most important for Tenaska Washington II.

Hazardous Materials: The project, in operation, will employ potentially hazardous materials (Table 5.9-1). The procurement, transportation, on-site handling and
T24/1
disposition of these materials will introduce new and possibly significant environmental risks to the site and surrounding region. Serious groundwater and stream contamination, health impacts and biological damage could result from improper or accidental release of these materials. These risks will be present not
T24/2
just at the plant site, but along transportation routes and at procurement and disposition sites, as well. This issue was raised during the Council's Section 6(c) review of Bonneville's acquisition of Tenaska Washington II. Because these risks were not fully assessed in Bonneville's Record of Decision or in subsequent testimony, the Council, in its Record of Decision (ROD, p.7, enclosed), stated its expectation that the risks associated with hazardous materials would be assessed in the Environmental Impact Statement. While some discussion of on-site storage and handling of hazardous materials is provided in Section 5.9, the draft lacks a

T24

comprehensive, in-depth discussion of this issue. The following additional material is needed:

* The definition of the affected environment should be expanded to include procurement sites, transportation routes and disposition sites established specifically to serve this plant.

* Elements of the affected environment (soils, groundwater, surface waters, habitat, traffic and transportation) that would impact or be impacted by

T24/3

hazardous material releases should be described in Section 4.

* Regulatory requirements applying to hazardous material procurement, transportation, on-site handling and disposition should be described.

* The analysis of the potential for environmental releases of hazardous materials should be expanded to cover procurement, off-site transportation and disposition. The scope of the analysis should be expanded to include possible

T24/4

soil, ground water and surface water contamination and biological impacts.

* Risks associated with handling and disposition of air pollution control catalysts should-be assessed. These can be considered hazardous because of their heavy

T24/5

metal content.

Regional Power System Impacts: As discussed in the Council's Record of Decision (p.15), addition of dispatchable gas-fired resources to the regional power system has the potential to modify the seasonal pattern of hydropower system operation in a manner detrimental to the objectives of the Columbia River Basin Fish and Wildlife Program.
Tenaska Washington II, as the first dispatchable gas-fired resource on Bonneville's system, is not likely, taken by itself, to have a significant effect on resident or anadromous fish through associated changes in the operation of the hydro system. The final eis should establish this fact. The eis should also acknowledge that as

T24/6

additional gas-fired generation is integrated into the regional system such an effect may result, as a cumulative environmental impact associated with the operation of this type of plant. While this is an issue that deserves further consideration in Bonneville's planning for longer-term additions to the power system, it should not be ignored here. The nature of the issue, its long-term implications and a proposed approach to monitoring and assessing the possible emergence of this impact should be discussed in this document.

Cooling Tower Drift: Chlorine and other biocides found in the plant cooling water may be released to the atmosphere in the form of cooling tower drift. Deposition of

T24/7

these chemicals in the area surrounding the plant may affect surface water and vegetation. These potential impacts should be assessed.

Irreversible Commitment of Resource: The draft eis states that the consumption of natural gas and fuel oil cannot accurately be determined at this

T24/8

time. We believe that reasonable estimates of the likely capacity factor, and

T24

annual average hours of operation on fuel oil can really be made. Fuel

T24/8

consumption can then be estimated.

Vibration: The issue of ground-transmitted vibration was raised in the course of the Council's Section 6(c) review of Bonneville's acquisition of Tenaska Washington II. During that review, Bonneville supplied evidence convincing to the Council that vibration would not be a problem (ROD, p.28). While the Council concluded that vibration is unlikely to be a problem at Tenaska Washington II, vibration as a potential consequence of combustion turbine combined-cycle power plant

T24/9

operation should be assessed.

Global Warming: The contribution of Tenaska Washington II to potential global climate change was a topic of considerable discussion during the Council's Section 6(c) consistency review. The global warming issue is very briefly discussed in Section 4.4.4. and receives some additional discussion in Section 5.4. This issue is not mentioned in the Summary, even though it is one of the major issues in current discussions of energy policy. The discussion of global warming should be augmented to convey more fully the nature of the issue, the potential contribution of this plant, emerging international and federal policies, planned mitigation, and
T24/10
further mitigation opportunities, if ultimately needed. Global warming should appear in the Summary, as an unresolved issue (S.6.3), and as a potential environmental impact (Table S-1).

Other:

. The last paragraph on page 3-4 states that air pollutant emissions will be minimized using Best Available Control Technology (BACT). We understand
T24/11
that the proposed nitrogen oxide control will be Lowest Achievable Emission Rate (LAER). The last paragraph on page 3-4 should be modified to convey this fact.

. Equivalents of Tables 5.4-5 and 5.4-6 should be provided for firing on fuel oil.
T24/11B

. Section S.6.2 states that no evidence has emerged in preparation of the Environmental Impact Statement to suggest that the proposed action is particularly controversial. To the contrary, the Council, in its Section 6(c) review of this acquisition, encountered substantial environmental controversy. Issues raised during that proceeding include the impact of the proposed plant
T24/12
on the Columbia River Fish and Wildlife Program, global warming risk, location in an ozone non-attainment area, environmental effects of fuel oil operation and ground-transmitted vibration. These issues should be identified in Section S.6.2. Discussion of these issues is provided in the Council's Record of Decision.

. The final paragraph of page 5-10 states that the plant would burn natural gas for all but 120 days each year when fuel oil would be used. Fuel oil burn will
T24/13
be limited to approximately 120 hours per year, as controlled by cumulative releases or sulfur dioxide. Moreover, the statement implies that fuel oil will

T24

definitely be used for 120 hours annually. Not so. Fuel oil is expected to be
T24/13
used only as necessary.

The first paragraph on page 5-13 draws a comparison with Texas plants which have never operated on fuel oil. The comparability of these plants is
T24/l4
questionable. First, if near the Gulf Coast, the Texas plants are located at a natural gas source and within a dense pipeline network. This contrasts with the Frederickson situation, where the plant is served by a single gas pipeline, many hundreds of miles from the gas fields. Second, the Texas plants operate in a summer-peaking electrical system, non-coincident with the winter peaking gas system. Again, this contrasts with the Tenaska Washington II situation where the plant will operate in a winter-peaking electrical system, coincident with the winter-peaking gas system. These factors suggest that Tenaska Washington II is more likely than its Texas counterparts to encounter situations where operation on fuel oil is necessary.

Thank you for the opportunity to review and comment on this draft. We intend these comments to be constructive and look forward to the final document. Questions concerning these comments can be addressed to Jeff King of our staff.

Yours truly,

Edward W. Sheets
Executive Director

Enclosure

cc: Dick Watson
Jeff King
William Hannaford
Council Members

T24

LASER

Legal and Safety Employer Research
DIVISION OF THE WESTERN STATES PIPE TRADES
670 KENTUCKY STREET, GRIDLY, CA

EPA - Mr. Clarke
201 Queen Anne Avenue North
Seattle, WA 98109

Dear Mr. Clarke:

I am the Director of Legal and Safety Environmental Research (LASER, formerly TAME TIC), which researches large industrial projects in the Western United States. The following are comments regarding the proposed Tenaska 240 Megawatt natural gas fired power plant to be sited near Tacoma.

NOx EMISSIONS

This power plant will emit about 4 parts per million of oxides of nitrogen, and another 10 parts per million of ammonia (ppm). This low NOx emission rate is necessary because the plant must stay below the 100 tons/year limit for NOx emissions, to avoid the onerous review process for a major polluter sited in a non-attainment area.

The problem is that the ammonia emission rate of 10 ppm is really an additional emission of 10 ppm of NOx. This is because the ammonia itself will not remain as ammonia, it will oxidize into oxides of Nitrogen. Therefore the actual NOx emission rate for this plant will be nearly tripled to around 300 tons/year of NOx emissions, if the conversion of ammonia to NOx is considered. T25/1

This means that other technologies, such as overwatering to reduce NOx, or the use of low-NOx burners, are actually more efficient than selective catalytic reduction (SCR) if these technologies reduce NOx to below 14 ppm. This is because the Tenaska plant will actually be emitting 14 ppm of NOx; 4 ppm directly of NOx, plus another 10 ppm of ammonia that will rapidly oxidize to NOx.

Therefore the final eis should discuss alternative NOx control technologies such as low-NOx burners (the new low NOx burners is reportedly controlling emissions to below 6 ppm NOx) or overwatering/steam injection to reduce NOx. These mechanisms will produce the same ultimate control of NOx, after taking into consideration ammonia/NOx conversion, without running the risk of transporting and storing and using ammonia. T25/1B

OCT-04-1993 15:10 P.01

T25

AQUEOUS AMMONIA

If ammonia is ultimately used, the plant should consider

aqueous ammonia, rather than anhydrous ammonia, to reduce the risks from a release. T25/2

RISK ASSESSMENT

The Deis fails to provide a risk assessment of the effects of a large release of natural gas, fuel oil, acid, caustics, and ammonia. All these substances will be stored in large amounts at this site. T25/3

ACID EMISSIONS

Attachment 3, sheet 4 lists 8 lb/hour (about 30 tons/year) of "sulfur mist" emissions. The Deis does not describe the impact of these emissions which may actually be sulfuric acid mist emissions. T25/4

WASTEWATER

This plant may be using a regeneration system to treat its water. These kinds of systems may involve backwash and the production of solid waste containing high concentrations of toxic materials. This should have been discussed in the Deis. T25/5

WASTES

Tenaska should not be allowed to burn construction debris including but not limited to cleared brush and trees. This site is in a no burn area. T25/6

Please send a copy of the Final eis, and copies of all remarks received by BPA regarding the Deis, to LASER's consultant:

John Williams
12770 S. Foothill Dr.
Portland, OR 97225
503-626-5736
(fax) 503-641-2093

Yours, Jim Wilson

OCT-04-1993 15:11 P.02

T25

UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA

Local 82

2725 Pacific Avenue
Tacoma, WA 98402

October 04, 1993

Bonneville Power Administration
Mr. Stu Clarke, Public Involvement Manager
201 Queen Ann Avenue North
Seattle, WA 98109

Dear Mr. Clarke:

The following are comments regarding the Draft Environmental Impact Statement (Deis) for the Tenaska Power Plant.

1. We did not see any discussion in the Deis regarding the fire controls through the use of appropriate sprinkler systems. This is very important considering the use and storage of large amounts of natural gas, fuel oil, ammonia, and other toxic materials at the power plant site. T26/1

We understand that a fuel oil fire at a O'Brien Energy Power Plant back east killed two workers. This illustrates the need to T26/2

plan and discuss fire prevention measures such as sprinklers. We suggest the final eis discuss the O'Brien Energy Fire, its causes, and the preventative measures to be taken at Tenaska.

2. The Deis did not discuss how the discharge of stormwater from the plant site will affect the county sewer system. Even though the stormwater will be discharged onto the ground through a swale system, it is likely that this stormwater will infiltrate the county sewer lines and add to the amount of water flowing to the treatment system. The final eis should discuss how much of this stormwater discharge will simply seep into the county sewer lines. T26/3

Please send us copies of all comments received by our agency on the Deis for this plant.

Sincerely,

James E. Eustace
Business Manager
UA Local 82

JES/df

OCT-04-1993 15:56

T26

John Williams
12770 S. Foothill Dr.
Portland, OR 97225
(503) 616-5736
fax 503-641-2095

BPA
comments on Tenaska Power Plant
Mr. Stu Clarke

Dear Mr. Clarke:

I am a consultant to LASER, who is also submitting comments under separate cover. Here is an additional comment from LASER. Table 5.4-3 states that NOx is not ... an ozone precursor .." LASER disagrees. According to the Standard Handbook of Environmental Engineering, p. 4.3:

"Photochemical oxidants, mostly as ozone are the product of atmospheric reactions of such contaminants (precursors) as hydrocarbons and nitrogen oxides in the presence of sunlight." (McGraw-Hill, 1990 edition) T27/1

We argue that NOx should be recognized as a ozone precursor in the Deis.

Yours,

John Williams

OCT-04-1993 16:07 P.01

T27

COMMENTS FROM PUBLIC MEETING

TABLE 3.4-2
Public Meeting Transcript Key

Commenters	Comment Numbers	Location of Comments (Transcript Page No.)
Jill King	PM1-6	Pages 22 - 23
Clark Abraham	PM7-13	Pages 23 - 25
Steve Lane	PM14-21, PM66	Pages 25 - 27, 64
Matthew Schipper	PM22-25, PM63-64, PM67	Pages 28, 59, 65
Roxy Giddings	PM26-37	Pages 29 - 37
Nancy Holbrook Greenhouse Action	PM38-49, PM65, PM68	Pages 38 - 43, 61, 66 - 67
Earl Iverson	PM50-51	Pages 44 - 46
Al Schmauder	PM52-54	Pages 46 - 50
William Giddings Tahoma Audubon Society	PM55-62	Pages 50 - 53

NOTE: Only those pages containing comments are reproduced in this document.

BEFORE THE
U. S. DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
SPANAWAY, WASHINGTON

PUBLIC HeaRING

In the Matter of:

DRAFT ENVIRONMENTAL IMPACT
STATEMENT

Concerning

PROPOSED TENASKA WASHINGTON II
GENERATION PROJECT

Library,
Bethel High School,
Spanaway, Washington.

Wednesday, Sept. 8, 1993

Pursuant to Notice, the above-entitled matter came on for Hearing at 7:00 o'clock p.m.,

BEFORE:

A PANEL CONSISTING OF

STUART CLARKE, State & Local Government Coordinator,
BPA - Member & Facilitator; presiding;
NANDRANIE TUCK, Project eis Manager, BPA Member;
RON HOLEMAN, Project Manager, BPA - Member;
TOM HENDRICKS, Vice President, Tenaska Power Partners L.P. - Member;
PHIL PINARD, Senior Planner - Member.

INDEX

P R O C E E D I N G S

OPENING REMARKS & WELCOME BY MR. STUART CLARKE

MR. CLARKE: If we could get people in the back to come up and take a seat, I think we can go ahead and get the formal part of the meeting started.

I'm Stuart Clarke and I'm basically here to facilitate the meeting tonight, and I work for the Bonneville Power Administration. And I brought along a lot of other people that have a lot more knowledge about the Tenaska Project than I do to answer questions that the people here tonight may have.

I hope when you came in, everybody took the time to register, and then that gives us knowledge about who was here tonight, and also if we have to get back to you to clarify something that we heard, we'll have that opportunity.

This meeting tonight is being recorded by a Court Reporter, Bill Chun. We're in such a -- it's a good room and has good acoustics, and we've got a fairly small crowd; so, I didn't put a microphone out in the audience. But if for some reason we need it, we have that ability.

I hope everybody picked up an agenda when they came in, and if you'll just take a look at that for a minute. You know, for the last hour, basically, we had an open house. I hope most of you got a chance to walk around and look at some of the displays, maybe talk to some of the people that are

here tonight from BPA and Tenaska and some of the consultants. If you had some particular items you really wanted to get some in-depth discussion about, they were here for that purpose.

And some of us are up here at the front of the room and we're going to try to answer your questions. If we need help, we'll call on some of the other people in the audience. But I'd like to go ahead and introduce the people that are here with me up at the front.

At the far end of the table, we have Ron Holeman who's the Project Manager for BPA. Then Tom Hendricks, who's a Vice President with Tenaska Power Partners. And next to Tom is Phil Pinard who's with Pierce County. And Pierce County -- Phil will talk about their process and what happens and how they're working with BPA in their process. And then, right next to me here is Nandranie Tuck who is the Project eis Manager.

And they're all going to have a little bit to say here in the first 30 minutes of the program where we're going to try to give you a little background about the project, and then for the last hour and a half, we'll open up the meeting for your comments and also your questions and answers.

One more little housekeeping item before we really get into this just to let everybody know the school asked us to use the restrooms that are down by the gym. So, when you go out here, you take a right, you go through the double

doors and they're just off to the left a little bit.

I guess the only things that I wanted to say tonight -- and I've already sort of referred to them -- is that the purpose of this meeting is to discuss this project, to talk about the environmental effects and the litigation measures that may be associated with this project. We're here to take your comments. We want to listen to your concerns; have a dialogue about the issues.

We did this about a year ago, actually, in our scoping meeting that was here, and I was at that meeting, and we actually had a very good discussion with the people that were here. We got a lot of good comments about air emissions, we got comments about water, comments about noise. People were concerned about traffic during construction and traffic IS during the operation of the project and those types of things. And, you know, we were able to tell them what we thought was going to happen and address some of those issues. And it helped us very much in terms of putting together the Draft Environmental Impact Statement which came out last month, because, you know, that told us what we needed to look at and what people were concerned about.

So, we're back here tonight. We hope that you've reviewed our material, and if there are some issues that you want to talk to us about that are in the Draft eis or not in the Draft eis, that's what we want to hear.

I guess the last thing that I would like to talk about before I ask Nandranie to talk a little bit about the eis, is that -- you know, Bonneville is in a situation right

now where we are deficit in terms of resources. And actually, let me back up just a little bit because I did have one person ask me about who is the Bonneville Power Administration.

Well, the Bonneville Power Administration is a Federal Agency. We're actually part of the Department of Energy. And what we were basically created for was to market the power that's generated at the dams on the Columbia River. So, we build a transmission system and we deliver that power to utilities and large industries that then use that power. But we also now have a responsibility under a law that was passed in December of 1980 to acquire resources to meet the needs of our utility customers. We have power sales contracts with them which -- where they can place their load on us.

And in working with those utilities and working with the Power Council, when we look out to the future over the next ten years, we believe that we're going to need about 1500 megawatts of power to meet the loads that these customers will place on us. And we have looked at that, and the way we've decided to try to acquire those resources is -- the first thing we're going to do is try to acquire about 660 megawatts from conservation measures. So, that's the first goal.

Then there's about 120 megawatts we can acquire

through system efficiencies on the transmission system and also at the generators that were built some years ago on the Columbia River.

So, that gets us up to 780, 800 megawatts. And the rest of it we think we're going to have to go out and acquire resources, and we will do that through a number of ways. We will have utilities through billing credits, offer resources to us, and we will acquire them; and then another way that we're going to do it -- and this is where Tenaska comes in -- is we went out and asked people to bring projects to us, and offer their capability to us, and this was under a competitive proposal -- a request for proposal; and we had over 100 projects that were proposed to us, and it was over 5,000 megawatts; and actually, the project that we've selected to proceed on is this Tenaska Project.

And so that's how we've sort of gotten to this situation that we're in now. Now, there are other projects that we're also proceeding on now. Some of them are -- for example, there's the Cowlits Falls Hydroelectric Project which is down in Lewis County. We're also looking at some other combustion turbines under our option program, and we're looking at some cogeneration projects that we want to bring on line. That's sort of how we got to this position that we're in now and why we're looking at this project.

So, I just wanted to go over that to give you a

little regional perspective on how we got here.
Anything else I need to cover? Can you think of anything?

MS. TUCK: I think you've done a pretty good job.
MR. CLARKE: okay. well, I guess with that, I'll go

ahead and turn it over to Nandranie. I know she had a few things that she wanted to say about the Environmental Impact Statement.

ENVIRONMENTAL OVERVIEW BY MS. NANDRANIE TUCK

MS. TUCK: Thank you, Stuart. Good evening. I'd like to pick up from where Stuart left off.

One distinction I would like to make is that Bonneville's proposal is to acquire the power from this proposed project. The project. owner is Tenaska Power Partners. They would be responsible for construction, operation and maintenance of this project.

As a Federal agency, we have responsibilities to comply with the National Environmental Policy Act. That is to discuss fully the environmental effects arising from the construction and operation of this project; and to look for feasible mitigation measures; to work closely with the developer in developing mitigation.

So, when our Administrator -- the Bonneville Administrator is ready to make a decision whether or not to acquire power from this project, he's making that decision

fully cognizant of the environmental issues involved and the environmental impacts.

You will notice if you have read the literature we've put out including the Environmental Impact Statement, that we have a proposed action and a no-action alternative. As I said, the proposed action is to acquire the power. The no-action alternative is to not acquire power from this project. And normally, in a NEPA process, you will look at a reasonable range of alternatives and look at the tradeoffs among those alternatives.

We did that in what we call a "programmatic eis." It's called a "resource program eis." And that document was concluded in February of this year, and we have an 18-page summary. If you're interested in reading that, give us a call. We can send it to you. If you would like to read the document itself, it's I think two or three volumes. It's quite hefty. We'll be happy to send that to you as well.

In that document, we discuss and we describe the various resource types that are available to us, and the environmental tradeoffs among the various resource types.

Conservation was the resource of choice in that environmental study. And combustion turbines fall very closely with that. It is among our preferred alternatives, because we recognize that conservation alone cannot fully meet our demands for energy.

Stuart mentioned to you that we had a competitive bidding process earlier -- no, it wasn't earlier this year, it was two years ago, and we received 102 proposals. Quite a few of those were conservation proposals.

We have taken all the cost-effective conservation projects from that competitive bid, and the Tenaska Project is one of three generating resources. And this project best met our criteria for being environmentally sound, cost-effective and viable.

Many of those proposals that we evaluated had a lot of strengths but none of them had all the ingredients that the Tenaska Project had. There are a lot of variables. Many things must come together. You have to have water resources, you have to be accessible to gas, you have to make sure that you are not impacting threatened and endangered species or critical habitats or sensitive habitats, and we were fortunate to have this project.

There are other actions that are mentioned in the eis. If, for some reason, Bonneville decides not to purchase power from this project, we do not have an alternative project. That's competitive. The competitive bidding program has closed.

What we would do is resort to other actions, and we have a diverse portfolio of different resource types; we have a geothermal pilot project; we have a wind program; we have an

RCP which is a resource contingency plan. So, there are many programs that Bonneville is running at the same time -- at the same time looking at all different resource types. Because we recognize that we have to consider things like water and the air shed and wetlands habitat, and you cannot concentrate all your resources in one resource type.

A year ago when we held the scoping meeting, as Stuart said, we had a very lively discussion. We heard from the audience issues that were important to them, concerns that they had about the environment. He used that as a guide for how to structure the eis, what our discussion should really focus on; and we came up with things that you see on the board. They were mainly air quality, hydrology, water quality, vegetation, noise impacts and so on.

And we hope that we have done justice so that we think we heard what you have said, and we have explored those issues fully in the eis.

In fact, we were faced with an interesting problem in the eis. Normally, NEPA tells us to focus only on significant impacts, and we began to work very closely with the developer from the very beginning in the project design phase; and a lot of mitigation measures were built into the project from the very beginning. We have a developer who's very concerned also about environmental effects, and wherever possible, have incorporated mitigation measures in the design

itself. So, I was faced with this dilemma as we were writing the eis, that we did not have unmitigated significant impacts. However, because we heard those serious concerns from the community, we went ahead and discussed them.

So, we end up with sort of a lopsided discussion where we describe the affected environment in detail, and one would expect, if you are really familiar with how an eis is normally structured, when you come to read the environmental impacts, you would expect that they would be big or significant impacts for some of the things we raised -- for example, archaeological resources, and there were no significant impacts. So, if you're wondering about that, because those issues were raised in the scoping meeting, we

have taken them seriously and we have discussed them in the eis.

What would really be useful for me is, if you find that there are deficiencies or inadequate discussions in the eis, I really would like to hear about that now. I'd prefer to hear about it now than when we have completed the final eis, because the next step from here would be to take the comments we hear tonight, and our comment period closes on the 4th of October, letters and phone calls that come in to us -- we will utilize those comments in making a final document. If we need to change the text, we will do that.

Typically, what would happen, we will have an

appendix in the final eis that has a comment response format. So, comments and issues that we have heard, we will state comments, and below that we will have our response to it, and that will be in the final eis.

We expect that final eis to be completed by early next year, perhaps a little bit earlier; and a Record of Decision shortly after that.

Phil will tell you about Pierce County's role. Pierce County has been working closely with me and I've reviewed the preliminary draft documents, and have given me some preliminary feedback, and we've incorporated that because Pierce County will have a very important role to play in making decisions pertaining to permits and other approvals.

And with that, I'll turn it over to who is next.

MR. CLARKE: Ron. I think what we'll do at this point, we'll go ahead and make our little presentations because we don't have too much more to do, and then we'll have questions. If you have see direct questions about this, we could have them at the end of that.

So, Ron, did you have something you wanted to say about the technology?

MR. HOLEMAN: Just a few words.

PROJECT TECHNOLOGY BY MR. RON HOLEMAN

MR. HOLEMAN: Good evening. The technology that was proposed to us by Tenaska Power Partners was a combustion

turbine combined cycle unit, single unit. Combined cycle -- there's a diagram over to your left -- as opposed to a simple cycle unit. A simple cycle unit like the peaking units that Pacific Power operates on 192nd Street, are just the gas turbines connected mechanically to an electrical generator.

Combined cycle -- what you do is capture the exhaust gases, have water loops that capture that heat, send it through a steam turbine and steam turbine generator, to get additional energy. A combined cycle unit is about 50 percent -- 46 to 50 percent efficient -- and this unit in the combination will produce about 248 average megawatts.

The comment that Nandranie made about the features that have been added to mitigate some of the environmental emissions, are some catalytic conversion in the HRSG that reduce the NOX emissions as well as some catalysts to reduce CO and CO2s.

And I'll let Tom speak about some other features and some other aspects from their perspective.

PROJECT STATUS UPDATE BY MR. TOM HENDRICKS

MR. HENDRICKS: Nandranie asked if I could give kind of an update going back to the scoping meeting that we held back here in this room in September of last year, just to bring everybody up to date on what Tenaska's been doing. We've had a couple of meeting, you know, since then with the Fredrickson-Clover Creek Community Council, kind of giving

some updates. I don't think they've had meetings over the summer. They kind of recessed their group and didn't meet over the summertime. So, when they get back into the swing of having meetings again, I think we'll be back in having sessions and updates with them.

Most of the work that we've been doing since the scoping meeting has been to provide information on the design of our plant to the environmental consultants that are working for Bonneville in preparing the eis. We've also helped putting together some of our permits and coming up with some answers to the questions that came up during the scoping meeting.

One of the questions that came up in the scoping session was, has Tenaska looked at underground transmission lines for interconnecting this project? And as a result of that question, we went back and did some work -- took a look at the cost and how much extra it might cost to put an under-ground transmission line in as a preferred alternate for Tenaska; and as a result of that, we've gone back to Bonneville and said that it would be our preference to go ahead with an underground transmission line to make this short interconnection over to the BPA switchyard. And I think it's being presented as an alternate, and there's two alternates of an above-ground and a below-ground. And our preferred alternate would be to go ahead and spend the extra dollars

l and put the thing below ground.

Another item that came up in the scoping meeting, we had photographs taken of a site from different vantage points around the Fredrickson industrial area, actually tethered a balloon and launched a balloon to be the height -- simulate the height of the tallest structure in our facility. And when we took those pictures, we had the balloon at I think a 125-foot height, and then we could show the neighbors around the site whether they could see it or not, and from a lot of vantage points you simply couldn't see it, but there were some where you could.

Since then, in the detailed work we've been doing with our air permit, in terms of the modeling and -- air modeling studies -- one change that's been wade from then is

that we've lowered the stack height by 20 feet so that the tallest structure now will be 100 feet instead of the 120 that was in those pictures that some of you may have seen. I think that height now is probably less than some of the transmission towers -- electric transmission towers that are in the area that go into the switchyard. Some of those are over 100 foot. So, we're now below that. So, that's one change that has come up since then.

I think as part of the scoping meeting or maybe some discussions that followed shortly after the meeting, there were some comments about the trees that are on our property.

There are some aerial photos that we've got here and had at the scoping meeting that show, you know, the stands of some of the firs and some of the Oregon white oaks. And what we're going to do is work with some of the folks who have some knowledge about the Oregon oaks and see which of those, particular some of the small ones, that could be transplanted out of our site area -- either put them into the landscaping plan for our facility or put them into some of the projects that the Clover Creek restoration group is doing in terms of their tree-planting programs.

There's also a couple of larger diameter oaks towards the middle of our property and we're taking a look at whether we can just realistically build around them and leave some of those oaks there, and we think it's probably possible to do it. we're going to have to do some more studies to take a look at whether some facilities can get moved one direction or the other. But we'll work -- again, we'll work with the folks that are interested and see what we can do to keep some of those trees. But we've tried our best to locate in areas where we wouldn't have to cut trees down and leave a lot of trees up for screening. But there are going to be some oak trees that are going to be there that we're going to have to look at to taking some other measures.

Since then, we've sent some information that I think -- most of that information is in the Draft eis, but we've

sent some information on to the Pierce County Sanitary Sewage District about how we intend to hook up to the sanitary sewer, and have given them some ideas of the direction that we'd interconnect with the sewer line.

We've given some information to Tacoma Public Utilities that they've used in preparing their certificate of water availability for the facility, and also put together information in our air permit with PSAPCA, Puget Sound Air Pollution Control Authority, and I think you'll find a lot of that data has been included in the Draft eis. So, if people have questions reading through that, we have people here that can help answer those questions. We have our consultant who worked on the air permit here that can answer some questions, too.

I think those are the main activities. There hasn't been a lot of detail design going on because you want to get all the input from this process before you do your detail design work. We won't have those final plans for several months, until all the feedback comes in from the permitting

in the Draft eis process.

MR. CLARKE: Okay, thanks, Tom. Phil, do you want to tell us about the Pierce county process?

PIERCE COUNTY'S RESPONSIBILITIES BY MR. PHIL PINARD

MR. PINARD: Good evening. I get the opportunity to talk to you about how this affects the local government and

what our involvement will be.

If you noticed on one of the panels when you came in, the Fredrickson area here is zoned M-2 which is -- it's a manufacturing designation. We have determined that this proposed use is compatible with that zoning so there will not be a public hearing process on the land use issue; so that the public hearing process, as far as the County's involvement, is limited to the environmental process that's being gone through now.

Our intent -- the County's intent will be to adopt this environmental document as the official County's environmental review. When we do adopt that document, then the proponents, Tenaska, can come to the County and apply for building permits for this particular project.

As far as when building permits are applied for, there will be seven or eight County departments that will then review the building permit application for compliance with the land-use regulations that they're responsible for, such as, Engineering will look at this project for storm drainage, for roads, flood plains and things like that. Utilities will review it for sanitary sewers; Health Department will look at it for water quality issues and things like that.

So, the County's review will be limited as far as their land-use regulations at the time of building permit application.

That's basically the process. If there're any questions again, I'll be glad to answer them in the question and answer period.

MR. CLARKE: We do have somebody going to-check on the noise.

(Laughter)

MR. CLARKE: so much for the good acoustics in this room. Before the noise started, could everybody hear what was going on? Okay.

We're actually doing a lot better than we did last year. Last year, we didn't confine our comments to 30 minutes, so this year we did a much better job.

Anyway, the rest of the meeting is really your part of the meeting. This is the part where you can provide comments or ask us questions and, you know, we'll try to answer those questions to the best of our ability that we can tonight.

When people came in, there were -- I had five people that indicated that they had comments; that they sort of had a formal comment that they wanted to make. And what I'm trying to do now is get information on how many people have comments and then how many people want to participate in a Q & A session. And the five people that said they had comments were Jill King, Clark Abraham, Steve Lane, Matthew Schipper and Roxy Giddings.

Now, are there other -- Nancy, you have some? Okay. And the gentleman in the back. Is there anybody else that has a comment? Okay. So, we've got maybe eight or nine people.

What I would propose that we do -- what I think would be a good thing to do is go ahead and let those people make their comments, and then we can go into a Q & A, and we'll have a dialogue. And if somebody has another comment, if you think of something, that's no problem. You know, get up in the question and answer period and make a comment, too. We're a small group. We don't have to be real formal here.

So, with that, and because we don't have too many people, I'm not going to go ahead and set a time limit. If it's obvious that somebody's using a little more time than they should, we may ask them to defer some of their comments and let other people have an opportunity, and then we'll get back to them. Okay.

So, with that, I guess I would go ahead and ask Jill King -- do you want to make a comment?

MS. HOLBROOK: Stuart, is it possible for people to find a seat, if they have material they want to bring up and have a microphone on a table?

MR. CLARKE: Sure, I can move.

MS. KING: I can just stand here, if that's okay.

MR. CLARKE: That's fine. Go ahead.

COMMENTS BY MS. JILL KING

MS. KING: I have it written down so I won't ramble on too long.

First of all, I just want to mention that there's obviously already an air-quality problem developed in the area. I know you guys probably live in the area, and if you ever watch for Mt. Rainier, as I do every day, you can -- on some days there's a little brown area around the mountain which is obviously smog, and some.days when it's completely clear, there's not a cloud in the sky, you can't see the mountain at all. So, that's the kind of thing that's evident to me about the air-quality problem that's already developing. PM1

My name is Jill King and I live on Dravis Street in Seattle, and I came to voice my opposition to the proposed Tenaska Plant.

It's my understanding that the State has made an official commitment to conservation and renewable energy PM2

resources. Building a gas-fired plant is clearly in contradiction to this policy. I don't claim to be a rocket scientist, but I'm familiar enough with the issues to know that if we're planning for the future, not five or ten years down the road, 20, 50 and 100 years down the road, we've got to begin moving away from fossil fuels as a primary energy source. PM3

No matter what technical arguments the natural gas industry can formulate in favor of this plan, the fact is that

gas is more polluting and much more expensive than the public is led to believe. PM4

The main question I have for BPA is, do we want to continue along the path of dirty, expensive fossil fuels, or do we want to abide by the Northwest Energy Conservation plans and plan for the next generation?

I'm in favor of investing more in conservation programs and renewable energy sources. We all know that these methods would be extremely clean and efficient and create more jobs that would stay local. PM5

I also realize the question of renewable energy sources is a political one and not a question of technology.

Please consider the true environmental impact on this community as well as finding lasting solutions for the future. PM6

I'm not really sure how far along this plan has come. I know that it's been developing for a while. The rumors that I've heard is that this is a done deal, and I really hope that just by coming here to voice my opinion that people on the decision-making committee will listen to what myself and other people of the same thoughts have to say.

Thanks.

MR. CLARKE: Okay, thank you, Jill. Clark Abraham?

COMMENTS BY MR. CLARK ABRAHAM

MR. ABRAHAM: Yes, my name is Clark Abraham; I'm

from Seattle and I oppose the building of this plant. And first, I would like to say that the technology for renewable energy resources such as wind and solar is available and can be implemented rapidly. And secondly, I wish to address the green-washing of natural gas which is not environmentally friendly like the industry would like us to believe. Natural gas is roughly 80 to 95 percent methane, and methane is a global warming gas; more than 60 times effective as CO2 at trapping heat in the atmosphere over a 20-year span, to quote the inter-governmental panel on climate change. It may be almost 70 times more powerful than greenhouse gas in CO2, molecule for molecule, over a 20-year timeframe. PM7 PM8 PM9

And I understand in your section 6(c) report, the natural gas for this plant will be supplied by three Canadian sources. From my understanding, about a third of natural gas from Canada is critically sour, meaning it comes out of the ground containing more than one percent hydrogen sulfide, a PM10 PM11

deadly toxic gas. Exposure to 1,000 parts per million or 0.1 percent of hydrogen sulfide is enough to cause instantaneous death in one breath. Exposure to 100 parts per million, or 0.01 percent, is enough to cause death or serious illness in children or elderly people, if exposure lasts more than a few hours. PM12

Then, by definition, critical sour gas contains 10,000 parts per million of hydrogen sulfide, which is much

more than the required dose for instantaneous death if breathed. And I do not want this natural gas plant anywhere near where I live. PM13

Thank you.

MR. HENDRICKS:-- Just one comment on the hydrogen sulfide if it helps you in understanding what happens. Gas that has any hydrogen sulfide is going to be treated there locally in the gas fields, and the hydrogen sulfide is going to be removed. So, when it comes through pipelines through the States of Washington and Oregon, like it does today, those hydrogen sulfide constituents have been removed. In fact, the gas that comes into. your home, they often have to add sulfur-bearing compounds to make it smell just so it gives an odor in case you have a leak in your home. So, sulfides have been removed up at the well head or up at the field, if that helps any of your concern there in the sulfides.

MR. CLARKE: Okay, thank you.

The next person who signed up to make a comment was Steve Lane.

COMMENTS BY MR. STEVE LANE

MR. LANE: My name is Steve Lane. I live on Dravis Street in Seattle, and while I find it laudible that the future needs of power for the region are being addressed, I find it reprehensible that these needs are to be answered with a gas-fired power plant. PM14

Contrary to the stated goals of the Northwest Power Act of 1980, specifically that priority be given to conservation and renewable energy sources, the fact remains that fossil fuel is a finite resource, and dependence on such forms of energy dictates that we will also remain dependent on foreign imports. PM15

The United States has less than 4 percent of the world's proven natural gas reserves, according to the American Petroleum Institute. Even including Canada's and Mexico's reserves, there's only enough natural gas to satiate current consumption rates in the United States for 16 years. PM16

The common misinformation provided by the natural gas industry is that of natural gas being a clean-burning fuel which is ridiculous considering that natural gas is 80 to 95 percent methane. PM17

The truer picture for the future of gas-fired plants is one of coal-fired plants with natural gas providing 10 percent of the fuel and coal providing 90 percent in the

combustion process.

By the way, current estimates of U.S. coal reserves show enough coal to provide centuries of unrestrained consumption.

The next thing you know, we're going to be hearing that coal is actually a clean energy source.

The lack of true visionary leadership is at the

heart of the problem. The community based around the proposed PM19
plant site should not be made to pay for the few jobs provided with their health and their children's health. Someone with courage would put their foot down and lead us toward a sustainable future, and further acquisitions of gas-fired PM20
resources would be set aside for the development of renewable sources such as wind, geothermal and solar energy, which are currently economically viable if not forced to compete with an PM21
industry that is subsidized with our tax dollars to keep the price of fossil fuel artificially low.

The ability to build a sustainable future for our children is being sacrificed in the name of short-term profits, and when the last drop of oil is squeezed out of the last rock and the last vapor of gas disappears into our atmosphere, and when coal is being fed us as our next clean energy source, the public will know that the wool has been pulled over their eyes once again. And the ones who led us down this path of unsustainability will long since have retired with money made at the expense and the health of the citizens they would have been serving, leaving a legacy of environmental degradation.

Again, I call for true leadership that will serve in the public's best interest, not in the interest of shareholders and profit margins.

MR. CLARKE: Okay, thank you. The next person is

Matthew Schipper.

COMMENTS BY MR. MATTHEW SCHIPPER

MR. SCHIPPER: You said it right.

I'm Matthew Schipper and I guess the number one reason I'm here tonight is, basically I'm going to be a father in January, you know, and I challenge you guys. I really question the fact that you're saying that, you know, this is PM22
the cheapest way to supply energy here in the Northwest and still be within the realms of not polluting our community and everything else.

Like he pointed out, basically, the fossil fuels PM23
industry in this country is subsidized with our tax money, and if that wasn't going on, and if you look at long term -- I think if you're looking 20 years, 30 years down the line, not ten years down the line, you know, it's evident that, number one, we're saving on health care costs, we're saving on the cost of bringing this stuff -- transporting it. There will be accidents. It might not be right here. But if we're building more gas plants, there will be accidents, there will be health

care costs. You know, that's just part of the reality. It's happened in the past and it will happen again. PM24

Things like solar power, wind power, conservation, energy efficiency, all are for the long term. They might not be, for you guys sitting up there, money in the bank in the short term. You know, coming from the aspect of thinking of PM25

my kids and my future and everything else, in the long term, that is something that I challenge you guys to plan for and take your positions of sitting there and planning this, and your positions of working for Bonneville which is a Federal agency which is paid for by my tax money; and plan long-term future for our kids and for everyone, and not for basically short term.

And that's what this country's been doing for years now, and it's going to be -- most of the people in this room aren't going to see the consequences of it. So, that's my concern, you know, and I guess it's a challenge, because you guys have a responsibility. You're sitting there and you have a responsibility to -- not just you right now, but to people coming 50, 100 years down the line, you know.

So, I'm against it. I think we should be planning for the future of this country. We should be using our science, our technology, to be coming up with ways of creating energy while not using fossil fuels.

Thanks a lot.

MR. CLARKE: Okay, thank you. Roxy Giddings?

Do you want to come up here?

MS. GIDDINGS: Yes, I'll just stand up here. I've got some stuff in this pile of stuff. I confess I have not read this whole document.

COMMENTS BY MS. ROXY GIDDINGS

MS. GIDDINGS: I'm Roxy Giddings. I live at 12211 "C" Street out in Parkland, and I'm really concerned a lot about the groundwater, the aquifer underneath all of this, and I read the eis for the Fredrickson plants and they've put in a lot of stuff that will hold even water in case of a fire in their building which they had; and any pollutants that are spilled inside their buildings go into tanks under the buildings and the water from the fire goes into the tanks under the buildings so that it can be treated before it ever would get into the aquifer. And I trust that all of the things that they say they're going to do they'll do in this one. PM26

I'm concerned about the amount of water that will be recharged back into the ground. The problem with putting the sewers in our here was that -- one of the things you talked about was that the water wasn't getting back into the ground to recharge the aquifer, and the New Growth Management Act has the aquifer almost totally inside the urban area. Just a few hundred feet of it are outside of it. PM27

So, we're going to be in a lot of trouble if we aren't paying a lot of attention to how much water we get back into the aquifer. PM28

The reason that I didn't get further through this than I thought I would was that I'm going along and I came to this little thing in here about the water. It says under

"Soils," Page 4-4, "Surface water percolates downward due to the gravelly structure of the soil, making protection of groundwater supplies from above-ground contaminants a concern."

And then it says, "The overall direction of groundwater movement in Central Pierce County is to the north or northwest towards Commencement Bay in Puget Sound. The aquifers of Central Pierce county are recharged almost entirely by infiltration from direct rainfall.

"The impermeable nature of the consolidated rocks along the south and east margins precludes the possibility of movement of large quantities of water into Central Pierce PM29 County from the mountains or foothills beyond."

So, I said, well, that sounds kind of weird, because I've always heard that we got our water from melt -- the deep aquifers are melt water from the glaciers, and it moves slowly through the ground until it gets to Puget Sound, and it goes right under us.

And then I turned to Page 2-4-6 and got -- they're talking about the City of Tacoma providing water to the area, including the Fredrickson industrial area. Now, in this little thing here -- this little summary -- it says, "The City does not plan to develop new groundwater wells specifically to meet demand imposed by the proposed Tenaska Project," but it says here, "The city's water supply is derived from the Green

River, a surface water resource area located in the north of King County, as augmented by groundwater.

"There are approximately 450 private and 45 public water supply wells within a three-mile radius of the proposed site. These public wells are under the authority of the City of Tacoma Public Utilities." And I'm going, "Wait, hold on. What is all this about?" And so I called up the Tacoma Public Utilities and they said they don't have any Public water supply wells out there and that they are going to drill a test well and it's going to be deep, over 400 feet, they said. They said it would be -- in fact, the guy's name is Craig Gibson and he's a Water Supply Manager -- that it's not correct; that there are no wells under the authority of the City of Tacoma there, and that they have a Sound -- Richardson, Bethel, Spanaway, and he listed off some other water purveyors that are around within probably that three-mile radius. But that the City of Tacoma has a 60-inch line down on 128th Street. I'm not exactly sure where it is -- maybe Canyon or something like that. But they would have to bring in a second line because there will be so much development in this Fredrickson area.

So, to say that they're not bringing in a well or to bring in more water specifically for Tenaska, is probably

stretching it a little.

I think he said two million gallons per day or

something like that was what they can bring in. Anyway, they're going to have a test well to find out if they can just plain suck water out of our aquifer for the use of all these industries out in this area. And he said that it would be below the one that is used by the main body of the community, which is our drinking water. There's like 170,000 of us drinking water out of the grounds so, we have to be paying attention to it.

So, I called up my local -- Parkland Light & Water -- and I said, "Do we have any wells near or within three miles of the plant?" And he said, "No, but," he said, "the wells that Parkland Light & Water have are between 30 and 640 feet deep. So, unless they're below 640 feet, they're going to be taking water out of the aquifer we use."

He also said that, "We presume that the water comes from Mt. Rainier underground, and that we have a 150-foot well that rises in elevation 25 feet four to five weeks after the rainy season starts." So, if it started raining like now, four to five weeks from now, this well would show a rise of 25 feet.

So, what they assume is that the groundwater does go down through this soil and gets in there. And he also said that there's something called -- that the aquifers are joined by what they call "windows" to each other under the ground. And I know that the top aquifer down in Parkland was

contaminated years ago. They had to drill deeper wells because the E-coli was getting into the first one. But they know they're connected so they really test all the time, and you know, it's really tricky. This whole groundwater thing is really tricky, because the glaciers didn't lay it all down in nice little even layers for us so we can keep them separated by a hard pan which we would all prefer.

That's on the water.

About the property itself, we went out and looked at it, and all these good folks -- there are some nice people here. There are some very nice trees out there and the eis says they are much younger than they, in fact, are. We did a core boring on an oak and came up with 120 years, and that was without boring to the center of the tree and losing about this much (indicating) of the first part of it. So, we counted 120 rings that wasn't truly -- I wean, it's older than that, but we can't figure out how much older. And that's the oak. And that's probably the biggest oak out there. PM30

And they were telling me tonight that maybe we could save some of these oaks by changing the shape of the berm that goes around the oil storage tank; because the fire department requires a certain amount of oil deal to be spilled within this berm area so it won't get away. And there's your ground-water again.

If anybody knows what this is, I sure would like to

know what this is. It's a pod of some kind of a flower and I've never seen it before, but it's growing out there underneath the oak tree. And the fact that I haven't seen it before doesn't mean a whole lot, because I don't know all about them all, but I notice some omissions in there in what possibly could be on that property as far as birds and animals and so on. I mean, they didn't mention the field mice when there's probably about five thousand million of them out there. PM31

These things -- these mitigation measures -- it says the stormwater runoff could be controlled, blah, blah. It could be that they'd store the tanks or the fuel and oil during construction over impermeable surfaces -- cover them or something, I don't know, and use tarps and all that. PM32

I'd just like to say this, that I looked at a lot of construction sites, and these so-called curtains -- something said something about curtains -- to keep soil from running off the property, or being where it isn't supposed to be -- didn't work. They do not work. Don't trust them. You go out there after a big rain and the soil will have filled up over there and just pushed them down and they'll just be running right down onto the neighbor's property or somewhere where you don't want it. So, I don't like those. Don't try them. They don't work. PM33

Also, in these things, we say, "The wildlife will be

displaced and we hope it will come back," blah, blah. Just forget it. Don't put that stuff in an eis. We don't believe it. It's not true. The wildlife dies when they cover up the ground. Everything dies underneath what was there. And if you don't believe it, just go out and look. Because if it doesn't get killed by the machinery running over the top of it and getting covered up, it gets killed out in the street where all the animals are all migrating away from the property or back to their property thinking they can come back for some reason or other. And it happens all the time. We run over it with our cars. And it just dies because there's no place for it to go. All the habitat is full. And so, there's already something there. And if it tries to go there, that something will probably either chase it out or eat it. So, no way. PM34

It says, "There will be 7.2 acres of impervious surfaces. That's quite a bit. And if the staging area can someday be put back into some kind of a condition where it's not an impervious surface, that would be certainly a request that I would make.

That's it. I'm really concerned about that groundwater, and of course, also there's the global concerns. It would be a lot cheaper if we just took the natural gas and ran it into our house and heated our water or our -- whatever we need to use it for. It would be a lot cheaper for us to just use the natural gas in the way it comes out of the PM35 PM36 PM37

ground, in our homes or in the industrial processes. It might

not be as clean as if you cleaned it up and put it into electricity, but -- do you see what I mean? It's probably cheaper, too.

MR. CLARKE: Thank you very much. It's obvious that you've spent a considerable amount of time looking at the eis, the Draft eis, in researching some of your concerns. And I guess I was wondering, do we have anybody here that can talk about some of those water issues? Are there any comments that anybody wants to make about that, or is that something we just need to look at further?

MR. HENDRICKS: I think some of the comments you brought up about the groundwater treatment and protection of the groundwater, are items that get addressed in a lot of great detail in the spill prevention and control plan, and are going to also be addressed in things like the hydrological survey that go to Pierce County. And what we've told folks at like the Fredrickson-Clover Creek Community Council, is that as this information gets available, we're going to have meetings and have more discussions with neighbors; and we know people that have the same concerns that you've brought up, and we're going to go over and review those plans with you, talk about them, make sure you're comfortable with the things that we're doing. You know, you have some experience with what went on at the Boeing facility; you know some things that have

worked well there; and we're going to be talking to people just like we have in the past. We've had a series of meetings and we can plan to continue on doing those.

MR. CLARKE: Okay. Nancy, did you want to come up?

Nancy Holbrook.

MS. HOLBROOK: Yes.

COMMENTS BY MS. NANCY HOLBROOK

MS. HOLBROOK: Thanks. I need the microphone. I came over from Whidbey Island and ever since I crossed through Seattle into Tacoma, I've been clearing my throat and losing my voice, and it must have something to do with that brown haze I saw covering the base of Mt. Rainier.

I'm the Policy Director for Greenhouse Action which is a nonprofit organization concerned with global warming and climate change issues. We have a technical advisory committee of atmospheric scientists and biologists in academics, including members of the National Academy of Science's Global Warming Task Force.

I guess I have to say, "Here we go again, another cheap fix." where have I heard this before? The Northwest is PM38 about to embark on a fossil fuel-based energy future, utilizing what one prominent government energy official refers to as the "crack cocaine of the electric utilities." We are referring to natural gas -- a fuel source that steers us PM39 toward ratepayers footing the bill for mitigation of yet

another cheap fix for our energy needs.

There are three main issues which we feel deserve more evaluation than they were given in the Draft eis:

Impacts of carbon dioxide regulation and who will pay those costs, the developer or the ratepayer; the actual need for the power; which pool of customers is Tenaska Power intended for; how will future DSI contracts affect this need -- DSI being direct service industries such as the aluminum companies; an how is the region's fuel switching potential going to offset the need for large, gas-fired generation? PM40 PM41

In 1990, the United Nations Intergovernmental Panel on Climate Change warned that more than a 60 percent cut in carbon dioxide emissions would be needed immediately to avert rapid climate change.

In his Earth Day `93 address, President Clinton announced that he was committing the United States to reducing greenhouse gas emissions to their `90 levels by the year 2000.

In addition, other cities and states have more ambitious goals or are considering setting more ambitious goals.

Portland, Oregon has a CO2 reduction strategy which calls for a 20 percent reduction in carbon dioxide emissions below the `88 level by the year 2010. Despite all of this, plans by Northwest utility companies could increase carbon dioxide emissions 8 to 20 percent by the year 2013, by their PM42

concentration on natural gas turbines for electrical generation.

Spending a million dollars for carbon mitigation works out to about 4 cents per ton of CO2. A much more appropriate cost would be the $10 to $40 per ton that the Oregon Public Utility Commission is requiring utilities to use when analyzing their costs.

10 mills per kilowatt hour at the minimum would be more realistic. Remember, Clinton won the election, not Bush. And guidelines for the goal of stabilization of CO2 at `90 levels by the year 2000 are forthcoming. BPA needs to speak to this.

We understand -- let me go on and say that nowhere in this analysis is there a recognition of the cumulative effects of gas generation and its effect on the Northwest. PM43

We understand that Tenaska's developers have been unable to obtain insurance against the risk of future CO2 regulation. Does the insurance industry know something Bonneville does not?

In California, developers are required to absorb these costs. BPA should require no less. The public interest mandates this protection.

In addition, we believe a more detailed description of the supply availability of No. 2 fuel oil is warranted. The Electric Power Research Institute or EPRI's study on PM45

natural gas supply issues raises several questions as to the future price stability of this oil and states, "Back-up supplies of low sulfur residual fuel oil will most likely be

expensive and difficult to obtain from U.S. refiners." Therefore, utilities will probably have to seek these incremental supplies from sources overseas.

Clearly, electric utilities face substantial uncertainty, both global and domestic, about having the appropriate back-up fuel available when needed for power generation. Each utility must analyze its own specific situation.

We believe that the extreme cold weather condition under which the plant would burn oil could also be periods of PM46
air quality emergencies. How would this be treated? Has an exemption for burning during these episodes been obtained? If interruption of power is likely, what are the costs associated? Is EPA proposing a reserve to cover such emergencies?

Fuel price risk of two mills and a one-mill adjustment for environmental costs is inadequate.

Need for power -- your recent edition of the Journal -- this is BPA's journal they put out once a month -- notes that Reynolds Metals Company will shut down two potlines at the Longview facility. The cutback will reduce Bonneville's firm power load by close to 100 megawatts. We believe other

aluminum company cutbacks are likely given the current status of world markets.

The assumption that additional DSI contracts will be renewed is premature. What rate pool is Tenaska being acquired for?

Fuel switching: Last year's report from the White House Office of Management and Budget estimated that 240 megawatts, which is the equivalent of a Tenaska, could be obtained by converting 500,000 homes from electric to gas water heating at a cost of $150 million, far below Tenaska's cost of $925 million.

With your own, BPA's, fuel choice program scheduled to run through 1995, why not at least compare the possible PM47
benefits of gas-fired generation with fuel choice options?

We will be submitting lengthier written comments before the close.

I have to comment on two more things. Surely by now Bonneville must understand the problems of after-the-fact mitigation. If that wasn't made clear by what we're dealing with the nuclear projects and the waste that's being stored at facilities that nobody has anything to do with, surely the salmon crisis and the amount of money that's going to be required to go back and fix that, should bring the point home. And we believe CO2 mitigation costs are yet another PM48
cost that the ratepayers are at the risk of having to pay for

as they are having to pay for the short-sightedness of building dams without fish passage and constructing nuclear projects, when they were not needed.

I believe somewhere in one of the BPA reports, I saw, they said, "Natural gas is benign." And I just -- I PM49

don't understand that. There is, within the environmental community, even disagreement over pursuing fuel switching. We take the position that fuel switching needs to be evaluated.

The other thing I would like to comment on with regard to the comment made on the hydrogen sulfide and the sour gas in Canada -- while it may be true that it is not delivered to Tacoma with the sulfide in it, I believe there are some concerned citizens in Alberta where the gas is being removed, that would beg to differ that it's not a problem.

The upstream and downstream benefits, or I should say costs, of fossil fuel projects simply have to be included in this analysis.

Thank you.

MR. CLARKE: Thank you, Nancy. The other people that raised their hands, I don't know your names. And before we go on, one thing that I would like to emphasize that Nancy referenced is that Nandranie said the comment period is open until October 4th. So, this is not your only opportunity to make comments. We'd like to hear your comments and questions tonight but if you think of something after tonight, you know,

take one of our comment forms and fill it out and mail it in or just put a letter together and, you know, mail it to us at our address. Or if you have one of the fact sheets, there's a number of telephone numbers on there also. You can call us up if you have some questions. So, I just wanted to make sure everybody understands, this is not the last opportunity.

QUESTION: I thought it was October 24th.

MR. CLARKE: October 4th?

MS. TUCK: October 4th -- 45-day review period.

MR. CLARKE: Okay, the gentleman here in the yellow sweater had some comments.

MR. IVERSON: My name is Iverson.

MR. CLARKE: Could you give us your name again?

MR. IVERSON: Earl Iverson.

COMMENTS BY MR. eaRL IVERSON

MR. IVERSON: I read this over, and according to this, it's only good for 10 or 20 years, and they're going to use 100,000 gallons of water a day and they're going to get first choice; the Simpson pulp mill will get the second PM50 choice; and the third choice will be the people of Tacoma and Pierce County, which will have to probably be on ration.

I'm not so concerned about that as I am about the gas itself. Now, the gas comes out of the ground and it's the same kind of gas that they -- when they take coal down in the mines, it's the same kind of gas that explodes and it will

explode on top just as well as on the bottom.

Now, I talked to those two gentlemen there when I

first came in, and I told them what I thought of this project. If an accident happens which anything manmade can happen, it will blow this project sky high to smitherings, and it will knock the valves off. He says there are back-up valves. That gas -- electric gas would go back up through that pipe and knock those valves out just like that; and all the natural gas that's coming from Canada would go up in the air and form a cloud, and if it gets big enough it will drift to Boeing and kill 11,000 people inside of a few hours; and if it comes this way, it will kill all the people in this school and throughout the environment in just a matter of hours. PM51

Now, I'm against this completely, and I'm going to take all the action I can to stop it. I don't want the city of Tacoma or Pierce County to go into this with their eyes not open. It's a dangerous thing. It really is. And any time you have gas -- I don't care where it is -- when I was about 30 years old, there was a fellow working underneath a house and trying to repair the gas line, and they dragged him out of there dead as a doornail. Gas will kill anybody. It doesn't show favoritism.

So, they're not after the money because they've got $281 million, the paper said, so they've got money enough to buy all the groceries, all the cars and all the houses that

they want for the rest of their lives. They're not after money. What they're after is to get power to Bonneville.

Bonneville, like you say, is covering the deal, and they're in debt right up to their ears in debt to Uncle Sam.

So, I'm against this 100 percent. I will take all the action I can as a person to stop it, for only one reason, and that's the gas; because the gas is deadly. It would kill everybody in this room or the kids in this room; kill everybody in Boeing; kill everybody that -- if it's going that direction, kill everybody within four or five miles; and the same way in the other direction.

You're working with a lethal thing here, and I don't like it, and I'm going to do everything I can as a person to stop it.

Now, I don't know how everybody else feels about it. would you like to see your family wiped out in just a matter of a few hours? That's what can happen. Gas. I know because I saw this fellow that was dead.

MR. CLARKE: Thank you very much. We understand your concern with the safety related to gas.

The gentleman in the back? Yes, sir.

Sit here or stand?

MR. SCHMAUDER: Oh, I think I'll stand up. I got a good voice.

COMMENTS BY MR. AL SCHMAUDER

MR. SCHMAUDER: My name is Al Schmauder. I live in Parkland, and a lot of my time is spent trying to work with

the Clover Creek Watershed trying to enhance it; and working with the salmon and all the aquifers and the wetlands that go along with our watershed.

Frankly, I've been very impressed with Tenaska's willingness to work with the community and to try to come out and seek issues on how we can resolve things. And this meeting tonight and the discussions going on, I think it's very open and healthy and I'm really happy to see that going on in a public forum like this because, well, we all have a lot at stake in this.

As far as our concerns in our watershed, our council members have real concern about the amount of water that's going to be consumed in this process. About 1.9 will be used and we keep the hundred. Apparently, about 1.8 million gallons a day are going to be released into the atmosphere and consumed.

The City of Tacoma is going to provide the water, PM52
either out of the Green River which is where they get some of the water now, or else through wells. They said they've got a 5-million-gallon pipeline coming out. Half is consumed now, another two million goes to Tenaska. We've got about one million left. I'm sure the Port is going to need way more than a million gallons to take care of the rest of the

expansion out here, so all of this project won't require them to drill wells.

In the future, we are setting ourselves up for a lot more water use requirements. And Pierce County is not very healthy when it comes to water. Most of our county officials view water use as the biggest single thing affecting us in the future -- how we're going to provide drinking water to the citizens and to the residences.

So, over 20 years with 1.8 coming someplace out of the ground or out of the river, is a real concern to me because of the future demands coming down the road. And I believe our aquifer will be considered the sole source -- probably designation this year, which places other requirements on how we deal with it.

So, I think Tenaska, being the good company they are, and the bright technicians and engineers I see coming out -- why not push them even further yet to see if we can't take that 1.8 million gallons and put it into some kind of a closed loop. I'd consider either a second turbine to help use up PM53
some of that steam heat, or try to get that water into a loop where we don't have to expend it; and in the process, remove the excess heat and use that -- spin that off to other industries in the port or off into other even residential uses perhaps. Pump it over to the residences and use that to heat homes.

I think -- I hate to be wasteful. I'm a CPA and that stands for one of the "cheapest persons around.' And if I see any energy being wasted, I start looking for -- you know, we don't have money to waste. So, a lot of heat in 1.8 million gallons going up. If there's a way to run that heat

into your loop, into the steam in there, get her off, save some of that water, maybe we can retrieve at least 75 percent of that water and then use that heat for other things.

We've got ideas in mind how that heat could be used, maybe for other things to enhance our watershed, and we'll discuss that later. But I would really like to something done with that water.

And I also don't know what the -- I think the eis could be improved when you work on the comments. Give us a little more information about how we're going to mitigate this use of water. And also, the plume -- steam plume now -- I didn't see anything in the eis that says, "what will that look like in the wintertime?" Is that going to be -- like Simpson, we know has a craft mill down on Chambers Bay, and it's a year-round steam plume. Now, are we looking at something similar, more or less? Will there be some visual effects that the neighbors are going to be complaining about? Is Ken going to be crying out there because his shop's in the shade half PM54
the winter already because of the clouds and the plume?

So, we probably should address what that's going to

do. But let's see if we can do something with that water usage. Thanks.

MR. CLARKE: Okay, thank you. Has there anybody else? Yes, sir.

COMMENTS BY MR. WILLIAM GIDDINGS

MR. GIDDINGS: My name is William Giddings. I live in Parkland, and I'm appearing on behalf of the Tacoma Audubon Society. I teach environmental chemistry; however, the university for which I work is in no way responsible for my comments this evening.

The Draft eis makes it clear that this is a project-specific proceeding, not addressing explicitly any alternative means of supplying energy which are higher in priority under the 1991 Northwest Conservation and Electric Power Plan -- namely, conservation and efficiency improvements, renewable resources and high-efficiency cogeneration.

Despite testimony before the Northwest Power Planning Council from public utilities and public interest groups that the Bonneville Power Administration had refused to participate in conservation proposals at a lower cost than this proposal, including one from Snohomish PUD for 240 PM55
megawatts equal in yield to this project, the Northwest Power Planning Council on August 11th adopted a Record of Decision that this project is consistent with Section 6(c) of the Power Plan.

Although that issue may appear to be settled, the eis nonetheless speaks to a number of the concerns involved in those proceedings making them still relevant to this evening's public hearing.

The required no-action alternative paragraph in the

eis concludes that unless BPA contracts for purchase of the power to be generated by this project, it's unlikely that it will be built, unless another customer for that much power should be found.

Action on the project cannot be taken until after the end of the comment period for this eis, so it is not too late for BPA to conclude that no project, or a different project, would be preferable to this one.

The testimony at the July 12th Northwest Power Planning council showed in detail how Bonneville policies and procedures, not questions of cost effectiveness or feasibility, have resulted in failure to implement conservation and efficiency improvements for more energy and at a lower cost than this project.

Although the environmental impact of this project may be considered "relatively benign" -- it's in the eis -- compared with the comparably sized coal-fire-generating facility, there is no evidence that identifiable conservation and efficiency projects would not be a better choice PM56 environmentally.

Among the strongest objections to increased reliance on fossil fuel combustion as an energy source, is the concern for carbon dioxide's contribution to potential global PM57 warming.

Although the United States Congress did not enact a proposed energy tax this session, there's no reason to assume that national policy arid international agreements will not include a carbon tax during the life of this project, or even before it comes on line. Whatever the tax structure may do to the economic viability of the project, the reason for our PM58 concern is the global environmental impact of increased carbon dioxide emissions.

Tenaska has recognized the importance of this question in its proposed carbon sequestering offset program. A range of 7 to 50 percent of carbon dioxide sequestering is proposed, depending upon the mix of specific forest preservation and reforestation programs in the Pacific Northwest, Russia and/or Costa Rica.

Looked at from the other side, this means that from half to nearly all of the plants emissions would remain PM59 unmitigated.

While we applaud the approach and Tenaska's willingness to address the problem, a 7 percent offset appears woefully inadequate. Offsets for criteria air pollutants in non-attainment areas must exceed 100 percent. Many of the

world's leading atmospheric scientists view global warming as the single greatest threat to the future of humanity and the PM60 environment, far more important than any of the air pollutants currently regulated.

Before the final eis is written, a more conclusive commitment to an offset exceeding 50 percent and approaching 100 percent should be demanded. If that is found to be too PM61 expensive, I submit that society cannot afford this project.

The Oregon Public Utilities Commission, we've just been told, recently adopted a range for analysis of ten to forty dollars per ton of carbon dioxide emitted.

It is noteworthy that insurance companies would not provide coverage against carbon risks associated with this project, nor is Tenaska assuming the risk. It is the ratepayers who are at risk for the potential costs of addressing the risk of further dependence on fossil fuels to be assumed by humanity and the global environment as a whole PM62

MR. CLARKE: Thank you. Do we have anybody else that wants to make a formal comment at this time?

(No response)

MR. CLARKE: Okay. I guess then we would move into the question and answer period. If there are people that have some questions about the Draft Environmental Impact Statement that they would like to ask and we could talk about tonight? Yes, sir? Could you state your name?

MR. WALSH: My name is John Walsh. I live up in Everett.

MR. CLARKE: Thank you.

MR. WALSH: Stuart, you mentioned earlier that you felt that BPA needed, for future use, something like 6,000 megawatts?

MR. CLARKE: 1500.

MR. WALSH: Oh, excuse me, 1500. Is that-- are you calculating by -- is that with more efficient equipment or is that by old standards, or how did they come up with that figure, do you know?

MR. CLARKE: Well, what we're doing there is we're looking at our forecasted loads and our resources, and so we're looking at the difference between our current resources and what we forecast the loads that our customers are going to place on us.

MR. WALSH: Okay. Can you turn around to the customers and say, "Well, we'd like you to use the energy more efficient so that we don't have to meet these demands"?

MR. CLARKE: Our plan is to acquire, you know, 660 to 700 megawatts through conservation programs, and the way those programs would be implemented in most cases is through our utility customers, and also at some of the industries and those types of places. So, yes, we would work closely with them to get them to implement conservation programs; and of

course, our customers are utilities, and where the real savings occur is at the end use -- the point of end use. So, that's at homes and at commercial establishments and industries. So then, those utilities go out and work with their customers, and that's where the real savings occur.

Now, utilities can save energy on their own system

and BPA believes that we can save about 120 megawatts through improving our generators and making some improvements maybe in our transmission system and also at our substations, at the transformers, and those types of things.

There are some utilities that are also looking at those types of programs, too.

MR. WALSH: Okay. I was just curious. You know, you say you're going to be saving 660 megawatts in conservation. Are you talking about mostly from industry or from private?

MR. CLARKE: I don't recall the exact breakdown.

MR. WALSH: Is that like -- you know, I was talking to some people that work for the utilities around here, and they say through conservation they save about -- I think it was 27 megawatts a year to go into, you know, insulating and things like that; and yet, the Commission has decided that this isn't worth it anymore and to stop this program. And yet, the people within the program feel that they can do better.

MR. CLARKE: Okay, you're talking Snohomish County PUD, because you're from Everett. Yes, it is true that we negotiated with Snohomish County PUD for a long time about implementing a conservation plan. I mean, we've been doing conservation with Snohomish County PUD since the early eighties, and we were unable to reach terms and conditions that were satisfactory to both BPA and Snohomish County, and so Snohomish County basically made a decision to dismantle their conservation plan.

There are still conservation programs being implemented in Snohomish County because there were some things that were left over that needed to be done, and also, in some instances, BPA is still working with industries up there where there may be lost opportunities. In other words, if we don't do the conservation right now, we won't have an opportunity to do it in the future.

Now, you know, a lot of the conservation will be there to go get in the future and we would certainly hope that we could work with Snohomish County PUD to put a plan into place to go get those conservation megawatts.

You know, BPA has had an active conservation program through the eighties, and I think we've acquired about 330 megawatts of conservation throughout the eighties. So, we think the 660-megawatt plan is quite aggressive when you compare it to our efforts through the eighties.

MR. WALSH: Well, I guess my only comment -- I thank you for answering my question. I can see the local people are concerned about water, and that is becoming a big issue. Not here but all over the place. And I think it would really be important for you to consider conservation instead of putting these people in the position of not having water for their homes. That's my only comment, I guess.

MR. CLARKE: Okay, thank you. Yes?

MS. HOLBROOK: Is it realistic that Bonneville will

address fuel switching in the final eis, under "Alternatives"?

MR. CLARKE: Nandranie, do you want to ---

(interrupted)

MS. TUCK: I don't believe so. This document is tiered to the resource program eis in which we have fully discussed alternative resources, and --- (interrupted)

MS. HOLBROOK: But you never discuss fuel switching even to begin with.

MS. TUCK: We have a policy now in place for that, and I do not think it's within the scope of this eis.

I want to say something to address a general comment that I hear about conservation and renewable resources. I'd like to remind you that this is one project. Earlier I mentioned that we have various energy acquisition programs. This is only one of them. Through the competitive acquisition program which was open to all sources which means that it

included conservation, we received several conservation proposals and we took all of those that were cost-effective. Someone has to pay for them. And are ratepayers willing to pay a higher price? And if you have been following Bonneville's business, you will know that there was a lot of controversy when we tried to increase rates just recently. So, someone has to pay the cost.

I would also like to address geothermal and wind resources. We have a very difficult time trying to site wind resources. To some, it appears as if they are benign. They are a renewable resource. Bonneville is a leader in the nation in trying to site and develop wind resources, but because of habitat issues or cultural resources issues or aesthetic issues, it's been very difficult to site one of those to date, and we're still persisting -- still working on that.

Geothermal is sometimes thought to be a benign resource. Perhaps it might be to some extent. Again, it relates to location. It depends on where the geothermal resource is. And there are impacts associated with that.

The bottom line is, there are no resources without costs -- financial costs and environmental costs. It all is a balancing act. And what Bonneville is trying to do is to diversify our portfolio.

We all know the impacts of hydro and nuclear. At

the present moment, we have various proposals in different stages of development and we have small hydro, we have biomass, wind, geothermal and combustion turbines.

Somebody has a question here.

MR. SCHIPPER: My question is, how can you honestly talk about costs when you're stilling coming from the aspect where you're saying this is one -- this is only one plant, you

know. And the fact is, what a lot of people here are talking about -- what I'm talking about is basically the long-term PM63
costs of putting, you know, the carbon dioxide, the methane Il into the air. These are not costs that can be figured right now. The cost it's going to cost to decommission the plant, the cost it's going to cost to all people if we continue to rely on fossil fuels. That's not in the eis. That's not figured in here.

You know, you're saying you're taking -- you know, you took these different plans and figured all the costs to the taxpayers and the ratepayers. Hey, I'll pay more now than having, 50 years down the line, having to spend billions of dollars to clean up the messes that we're making now. And that's what happens. And if you look back at WPPSS, if you look back at what we've done -- you know, if you look back with fossil fuels, period, that's what we're doing. And how can you figure cost without thinking about that the global PM64
cost and the health care cost and the cost of future

generations -- that's there. You can't ignore that.

MR. CLARKE: Did you want to reply?

MS. TUCK: I cannot see how you can say that we are ignoring that cost. It is a cost to society. My point was not that it is necessarily cheaper, it's that we do pay a price for any type of resource. None of the resources are benign, not even conservation. We can only get so much conservation. When we drive our cars to work, when we use our lawnmowers, we are polluting the atmosphere. Let's look at our lifestyle. Everything we do, we utilize a lot of energy, and we do cause environmental destruction. When I build a new home, I cause environmental destruction.

The point I want to make is that we -- whatever we do, there are consequences to it. And what Bonneville is trying to do is to balance it out. And the fact that we are interested in purchasing the power from this project doesn't necessarily mean that we're going to populate the entire Northwest or the United States with plants of this type. We are concerned about the consequences. We are concerned about the CO2 and its effects.

So, I would like for you to look at it from that perspective as well.

MR. SCHIPPER: Oh, I understand what you're saying.

MR. CLARKE: Okay.

MR. SCHIPPER: Still, that doesn't really change

what I've said about --- (interrupted)

MS. TUCK: I understand. Yes, it's a small comfort to you.

MR. CLARKE: Okay. Nancy?

MS. HOLBROOK: I'll try to be brief. Cost is

important and what we're saying is that you haven't accurately factored in realistically the costs. I mean, one -- I think most people would agree with that. PM65

Number two, in terms of Bonneville's commitment to resources, I have a lot of letters that have crossed my desk from utilities that are very frustrated with Bonneville's inability to work with them on conservation programs. I mean, there's just a ton of them out there waiting to offer conservation, and the process is difficult. It's cumbersome and it's difficult, and I think your own agency is working through that right now, and has acknowledged that.

In terms of the commitment to renewables, I must say that is proceeding at a snail's pace. Part of the reason I think siting acceptability is difficult right now is that there isn't enough education going on or dollars being spent on that. There are descriptions in the Power Plan of wind-monitoring stations that all they do is they just -- little machines that sit up there and assess the wind velocity through the seasons.

Now, there's supposed to be at least, I believe, ten

to fifteen of those. I think there's five of them right now. So, that's a specific that's not being fully funded, and that's a confirmation agenda item of the Council.

The geothermal demonstration projects -- there's three. Bonneville has proceeded slowly to fund what was required to get the eis off the ground at the Newberry Project.

I think everybody here would agree there's trade-offs.

I have to say that I served as a member of the State Energy Strategy Committee appointed by Governor Gardner two years ago, and we -- there was a poll commissioned on this whole issue of willingness to pay. It was very clear. We asked this question at all of our public hearings as well -- "Would you be willing to pay more and how much more for renewables," and it's in the majority every time. People say they're willing to pay more. And it isn't -- it isn't too much longer when you finally factor in true environmental costs of fossil fuels that those renewables are in a level playing field anyway. So, the question always bothers me as though it's a given that renewables are always going to be more expensive.

But I think -- you know, I heard a lot of talk at the public hearings I attended of people talking about their kids, their grandkids, and what about the future. And that

has been our basic problem in energy policy in this region is that we don't look towards the future. And I have to recognize -- I know Stuart pretty well. I think he's one of the good guys, by the way, at Bonneville, and I don't know you very well, but you probably are, too. And I hope the message that you guys are going to deliver to the people on top -- and that would be Sue Hickey and Randy Hardy -- is that there are some people, at least at this one little meeting, that had

some serious concerns, and nobody showed up to say they were in favor of this project.

MR. CLARKE: Yes, sir?

MR. LANE: Along those same lines, just a brief comment and then a question. I believe that education is the key, and if someone that is truly looking after the best interests of the public were to evaluate the situation, they would realize that education of the public and what natural gas the cheap alternative, quote-unquote, actually costs you through your tax dollars, because it is subsidized through your tax dollars to keep the price low.

I think that if the public is educated as to what the actual cost is, as she said, renewables are on a level playing field then, and I think that the public will accept -- I mean, I -- like, the people that I know and the people that I talked to are all willing to accept a higher expense now to protect the environment in the future.

I don't necessarily believe that the expense is going to be higher either. But I think that, you know, we're pretty much run by the oil industry.

One question I have though is, how do current air quality measurements compare with the Clean Air Act, and how is a gas-fired plant going to do anything but exacerbate the PM66 situation in this region that's currently not meeting up to standards, and isn't in the foreseeable future going to be able to?

MR. HENDRICKS: I think there's a pretty extensive section in the Draft eis that would walk you through the air emissions from the facility, and how, under the worst conditions the emissions from the plant would compare to all of the PSOPCA and Federal standards, and show you how far below all of the incremental standards, in comparison to all the significance levels --- (interrupted)

MR. LANE: I didn't see methane gas there, is it?

MR. HENDRICKS: Well, there's basically no methane emissions from the plant. I don't know what methane emission you'd be thinking of. There would be a small amount of -- trace amounts of unburned methane, but I think those would all be addressed.

As far as the critical pollutants, the volatile organic compounds, the NOX, carbon monoxide -- all those that are regulated by PSOPCA, I think are addressed in pretty great

detail.

You know, if you have questions on them, we can walk through -- we have air consultants that can help you understand what some of those terms mean. But I think you'll see that all the emissions and all of the impacts from the facility are far below the standards.

MR. CLARKE: Yes, sir?

MR. SCHIPPER: I don't know if I heard what he asked right, but I thought that he was saying that, you know, not so

much the plant specifically but the whole region is above standards; and by adding a plant, we're just going to be increasing the amount of pollution that we're dealing with. PM67

MR. HENDRICKS: I don't think there's any question that we're increasing the pollutants. I don't think there's any way that that's going to be avoided. I think the rules and regulations are set out by PSOPCA for meeting all the health, and safety standards for the air quality, and I think you'll see that the rules that are set up by PSOPCA are there to insure that air quality meets all the standards that are required.

You know, we have some folks from PSOPCA that can talk about it with you in more detail, but --- (interrupted)

MR. WALSH: Are we in compliance with the Clean Air Act, then?

MR. HENDRICKS: It's currently a non-attainment area

for ozone. Moderate non-attainment.

QUESTION: And carbon monoxide?

MR. HENDRICKS: And carbon monoxide.

MS. HOLBROOK: And if you look at those numbers that he's talking about in terms of how close they come to being a major source, it's like a major source is 100 tons, it's like 98.9. I mean, they're really bumping up against it. And if they get to 100, they have to get offsets which I don't think anybody thinks you can get in this area.

My discussion with the air quality people that I had a few days ago was, the whole question of cumulative impacts, and nobody's taken a look at this. I mean, there could be a couple of more projects sited, and if they all just bump up -- you know, what are the cumulative impacts of that? I mean, my understanding of non-attainment status is that at some point you have to say you're going to be in attainment; and there's got to be a plan to arrive at that point. And I would like to see a little more attention paid to that in the final eis, if possible. I think that is of serious concern.

I would also venture to say that with -- you can correct me if I'm wrong, but it seems to me that the long-term work force of this project is 25 to 30 people?

MR. HENDRICKS: 25 to 30.

MS. HOLBROOK: Okay. So, I guess I would say that the community needs to be more aware of, do we want a project

taking up that much airshed providing what I would consider to be a handful of jobs. I think that that's not appropriate to the eis, but I think it's a question for the people in the community to ponder. PM68

MR. HENDRICKS: Yes, I think there's a corollary to that, too, that one of the concerns that Bonneville has expressed, and I think other utilities in the Region have expressed, is that in this area, Tacoma, Seattle, west of the

Cascades, there's a real serious problem, because almost, what, probably two-thirds of your power actually gets imported into the region. You don't really produce it here. You're importing the power into the Seattle-Tacoma area through transmission lines, and there's a great deal of risk about the interruption and loss of the power supply by not having generation located here west of the Cascades. So, there's two sides to it.

I don't want to diminish your concerns, but there's also another concern about the liability of power and getting power into the region. So, it's --- (interrupted)

MS. HOLBROOK: I have to speak to that, because as Stuart knows, I served on the Puget Sound Area Electric Reliability Sounding Board with a group of people from Grays Harbor Commissioners and Power Council members and various other people. And one of the -- that certainly was a consideration.

But one of the options we came up with which, forgive me, I feel was a tad bid downplayed in the final, was fuel switching. And shortly after that study, the fuel switching study that originally started at Bonneville just got killed. Now, it's been resurrected with Randy, which is good, but I think there are certainly other ways to consider dealing with voltage stability. I think that's one more -- I would say that is one more reason to take a good close look at fuel switching, and I a distressed it is not going to be more fully evaluated.

MR. HENDRICKS: Also, just for your information, the Northwest Power Planning Council staff is putting together -- at least are collecting data right now about fuel switching, and one of the things they're asking people for input on is, what are the emissions from home heating appliances when you switch them over to gas. And it's really not a real clear-cut answer, because I think under a lot of cases, when you switch home appliances over to gas, you'll find that there's more pollutants through home furnaces than going through electricity, even through the conversion of gas into combined cycle power plants and into heating devices. And the Power Planning Council asked us for some input and we found some data from the American Gas Association on pollutants from home furnaces and supplied it to them, so they'll be doing some studies to show all the impacts, and it's --- (interrupted)

MS. HOLBROOK: Yes, I know. I'm sitting on one of those committees, the Gas Advisory Committee, and I know that that is ongoing. I believe what needs to be compared there, because we've seen studies to our energy strategy committee, that -- well, everybody has a study, I mean, and somebody needs to come up with "the study."

The critical point there is that you're using so much more gas to get 240 megawatts in a CT than if you directly use it, that I would submit that you compare the amount of gas you use, that you're still coming out with a net environmental gain with a fuel switch. But I would concede that the jury may be out on that.

MR. CLARKE: You know, one of the things we're

hearing here is when -- of course, you make this decision on this particular combustion turbine, it has a much broader effect. We're dealing with the whole environment and there are a lot of tradeoffs. And I think we're getting a little bit off base here. I mean, these are all related issues. I just want to give anybody an opportunity, if they have something really specific they want to talk about in the Draft eis, to bring that up.

MR. STEINER: One suggestion in response to your comment about cumulative impacts. Of everything that's going on in the basin for air quality, probably the best and most thorough study that's being done is for the State

Implementation Plan. Talk with PSAPCO about what they're doing, what plan are they developing too. They're required by the Federal Clean Air Act to attain the standards that are currently being violated for CO and for ozone. Talk with them about the plan that they're developing. They have to consider all projects going on. They have to consider the automobile -- all sources.

MS. TUCK: I'd like to say something about that, too. Nancy, I agree with you. I share your concern about cumulative impacts. We have looked into whether there are other viable projects that will be occupying this airshed, and there is none at the moment. If any is to follow us or if we were to be interested in a project within this airshed, then we will have to analyze cumulative impacts. As of now, it's not relevant in this particular situation.

MR. CLARKE: Yes?

MS. GIDDINGS: The other power plant that's out there -- Puget Power's -- what do they emit? And that's one question. And the other one is, the other power plants that are in the works for that property out there -- I'm wondering if anyone has come to the County yet to talk about it. I know there's another one -- at least one that they're talking about putting out there, and maybe more than one. There's nobody here from the Port that --- (interrupted)

MR. CLARKE: I don't know what the emissions are

from Puget Power's plant. It is a peaking plant. It can only operate -- I think it's up to 1500 hours a year. That's its maximum limit. I think that's correct.

MR. HENDRICKS: I would think that the Puget Plant doesn't have the catalyst controls put on it that our facility has, so I would imagine on an hourly basis that they're going to be several orders of magnitude higher -- maybe five to ten times higher, because of the removal we've got. Now again, it's a peaking plant, less efficient plant, more expensive to run. So, they don't intend to run it very often. On an annual basis --- (interrupted)

MS. GIDDINGS: If they ran it, we would be in our worst air problems. Just like that other comment about if we have to switch to the oil, we'd probably be at the worst time.

MR. CLARKE: Do we have any analysis on that yet?

MR. HENDRICKS: No.

MR. CLARKE: Okay.

MR. STEINER: Now, the impacts of burning oil have bee considered in the --- (interrupted)

MS. HOLBROOK: Right.

MR. STEINER: And it combines the worst case impacts while burning on oil with the worst case measured air quality in the region. That's a very conservative thing to do, but as you pointed out, there's a chance that the two can happen at the same time. Probablistically, it's a very low probability.

But if it happens, it's been addressed in the eis.

MS. HOLBROOK: But now, if there's another power plant brought in our there --- (interrupted)

MR. HENDRICKS: Phil, has anybody approached Pierce County?

MR. PINARD: If there's discussions about other power plants, they haven't filtered down to the staff yet.

(Laughter)

MR. STEINER: That's a good point about how cumulative impact analyses work today. We did a thorough review of all proposed projects and we screened them to make sure that they were for real projects. They had to be -- they had to have an active permit going on and they had to have realistic chances of being permitted. Anybody that passed that screening got included in a cumulative analysis. There weren't any.

But the next person that comes along that proposes one will have to consider this plant's emissions together with theirs and do a cumulative analysis.

MS. HOLBROOK: Okay. So, we're considering the ones that came from Puget Power's then, on this --- (interrupted)

MR. STEINER: They're in the measured base line. They're in the air quality monitoring --- (interrupted)

MS. HOLBROOK: Yes, that's what I understood. Part of the reason the area's non-attainment, I would imagine.

MR. STEINER: Part of the reason, yes. The auto-mobile that we all drove to the meeting tonight.

MS. TUCK: And lawnmowers -- they do emit a lot. Bill, do you have any figures on that? I was rather alarmed when I read about how much pollution they emitted, and it's something that I wasn't very aware of before.

MR. STEINER: And the point that Tom made earlier -- it really needs to be emphasized. A lot of people are concerned about converting back to direct use of natural gas

in the home because, you're right, it uses less gas. It's more efficient to use it at home, but it creates a lot more air pollution. You can't afford to put the kind of emission controls that you can afford to put on a power plant like this at home. It would drive you out of business real fast.

MS. HOLBROOK: Well, I think we decided the jury's out on that. I think the definitive study that everybody could point to and go, "yes," is not really out there yet. At least our State Committee, which was a pretty high-level committee, really took a shot at trying to get that figured out, and we couldn't.

Do you agree with that, Stuart? You sat in on some of those meetings.

MR. CLARKE: Yes, that's true.

Okay, other -- yes?

MS. KING: First of all, I don't envy any of you

guys in your job. I don't envy you having to sit up here and deal with us tonight. But I know that you want specific questions on the eis, and I'm totally opposed to the whole project to begin with, and I know that any issue of this sort comes down to cost. That's always the bottom line. And you have to deal with that.

And forgive me if I'm not quite as knowledgeable as I should be about all the details, but why is BPA in deficit at this point? Do you have any --- (interrupted)

MR. CLARKE: In terms of our resources?

MS. KING: In terms of dollars.

MR. CLARKE: The load resource balance?

MS. KING: Obviously, I'm in support of renewable energy resources, and right now what I'm hearing is that the costs are too high. And so I'm wondering why --- (interrupted)

MR. CLARKE: Well, there's a couple of reasons we're in deficit. Number one, there have been a number of major power plants that have been shut down over the last few years. Most recently, the Trojan Nuclear Power Plant which produced over 1,000 megawatts. BPA got about 330 megawatts out of that plant.

The changes that are being implemented on the Columbia River system -- the hydroelectric system of BPA gets about approximately 90 percent of their power from the dams on

the Columbia River.

Those changes that we're making to help the salmon recover, that's causing us to lose some ability to produce as much power as we have out of the past from those dams. And there is some controversy about how many megawatts that is, but there's definitely an effect on our ability to produce megawatts.

So, we've had a loss of resources to begin with -- ones that we've had there for years, and we've been depending on.

And then the other one is that there's a lot more people in the Pacific Northwest. We've had increasing populations which has led to load growth, and this has happened even though, if you went and looked at, say, average residential consumption back in the early eighties or late seventies and compared it to today, you would find that the average residence is consuming a lot less kilowatt hours per household. But the fact that we've added so many more households and commercial buildings -- we haven't probably added that much industry, so I won't say that -- but that just created more load growth. And so, people use more electricity.

And so, BPA currently supplies about 45 percent of the electricity that's used in the Pacific Northwest, and so when those loads go up, when the demand for power goes up. we

have to figure out a way to supply it. So, we're getting hit from both sides.

MS. HOLBROOK: Can I say one more thing, Stuart? I have to say it.

MR. CLARKE: Sure.

MS. HOLBROOK: In terms of the cost of why they're in trouble, you understand that a large part of what they serve is aluminum companies. I don't know the exact number. Stuart probably does. But what they pay Bonneville for the power is tied to the world aluminum market prices which are very low right now. Russia is dumping a lot of aluminum, and will for the foreseeable future.

So, when aluminum prices are low, the amount of money that the DSIs, the direct service industries, pay Bonneville is low. So, there's a loss of revenue there. When the world aluminum market goes up, they pay more. So, it takes a hit.

MR. CLARKE: That's true, right. At the particular time, that's true. We have what's called a "variable rate," and it's tied to the price of aluminum, and it is true right now that the price of aluminum is down, so what we charge the DSIs, that price is at the bottom of that rate. But also, it's true that if you look at the whole period that that rate has been in effect, we have collected about the same number of dollars as if we just had a rate that had been set and not

varied; because when we first put that rate into effect, the price of aluminum was high, and we were actually getting more money than we would have charged if we had just established a fixed rate.

But right now -- and Nancy's absolutely right, most people believe it's because of the Russians dumping aluminum. And the other thing that's happened- 25 percent of the power that we sell to aluminum companies is what's called "nonfirm power." so, it's power we don't always know if it's going to

be there, and it's dependent on how much water we get coming down the Columbia River.

The past year -- actually, the past six years have been very poor water years, and this past year has been extremely poor because we went into the year with low reservoirs. And we've had to curtail service to these large industrial companies. And what I mean by that is, we just have not been able to serve their needs because we don't have the nonfirm power. So, it is a big part of our load, and we have an obligation under our contracts to provide that service.

MS. KING: As far as the Trojan plan, who eats the cost with that? I remember reading in the news that it was a question of whether ratepayers would eat the cost for the plant closing, or would it be the shareholders or -- what's the latest update on that?

MR. CLARKE: That's Portland General Electric's plant. It's in Oregon. I haven't followed it that closely. I don't know if anybody --- (interrupted)

MS. HOLBROOK: I think that's sort of in process. The concern is that PGE will go under if they have to eat all that, and nobody wants PGE -- well, most people don't want PGE to go under. So, it's not going to just be PGE, I'm sure. The ratepayers will absorb some of it, I would imagine.

MR. CLARKE: Okay. Again, I think we're getting a little off center here from what we're here to talk about.

MS. KING: I realize that, and that's a question -- it's all related.

MR. CLARKE: That's okay. We're about at 9:00 o'clock. Do we have any other questions related to the Draft Environmental Impact Statement?

(No response)

MR. CLARKE: Okay. I guess once again I'll just say one more time, the comment period closes on October 4th. If you have additional comments, you can pick up one of the comment forms that gives you the address to mail it into. If you filled out one while you were here, just leave it back at the registration desk on your way out.

I'd like to thank everybody for coming tonight and providing the comments and questions and answers. I think that we learned some things from this dialogue and hopefully

we can address some of the issues in the final eis.

And the other thing is that, you know, if you do have some far-ranging questions that you would like to talk to somebody about, I'm sure most of us would be willing to stay here for a reasonable amount of time and just talk to you after the meeting.

So, with that, I'll close the meeting. Thank you.
(Thereupon, at 9:02 o'clock p.m., the hearing was concluded.)

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