APPENDIX H-5

BIOLOGICAL EVALUATION

BP CHERRY POINT REFINERY COGENERATION PROJECT

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Prepared for:

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Submitted By:

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EXECUTIVE SUMMARY

BP West Coast Products, LLC (BP) has filed an Application for Site Certification (ASC) to the State of Washington Energy Facility Site Evaluation Council (EFSEC). The ASC describes in detail the potential environmental impacts of a proposed 720-MW Cogeneration plant that will be constructed on industrially zoned property owned by BP adjacent to the existing BP Cherry Point Refinery (Refinery).

The Cogeneration Project (approximately 33 acres) represents a relatively small addition to the existing Refinery (approximately 600 acres), which has been in operation at this site since 1971. The existing Refinery fence line will be modified and extended to include the new facility. The proposed facility's impacts to sight, sound, land use, and habitat are expected to be small and similar in character to those that presently exist in this industrial area. Wildlife that currently use the area have adapted to the sights and sounds of existing operations and except for a small change in the developed area next to the Refinery, should experience little change in their habitat as a result of the Cogeneration Project.

BP, with the assistance of Golder Associates Inc., prepared this Biological Evaluation (BE) to facilitate consultation under Section 7(c) of the Endangered Species Act (ESA). In August 2002 and again in December 2002, Golder requested a species list from the U.S. Fish and Wildlife Service (USFWS) and consulted the National Marine Fisheries Service's (NMFS) ESA Internet site.

Based on the NMFS Internet site, correspondence with USFWS, and the Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) list, the following listed and candidate species were identified as potentially occurring in or near the project action area.

- Chinook salmon (*Onchorhynchus tshawytscha*) - Threatened
- Bull trout (*Salvelinus confluentus*) - Threatened
- Coho salmon (*Onchorhynchus kisutch*) - Candidate
- Bald eagle (*Haliaeetus leucocephalous*) – Threatened
- Humpback whale (Megaptera novaeangliae) - Endangered
- Leatherback sea turtle (Dermochelys coriacea) - Endangered
- Steller sea lion (Eumetopias jubatus) - Threatened

The BE describes baseline environmental conditions in the project area and presents information on the habitat requirements of these listed and candidate species and their potential uses of the project area. In addition, the potential impacts to listed, candidate, and other important ecological species are described in detail in this BE.

The following determinations for the effects on listed and candidate species are recommended in this BE:

- Chinook salmon - Threatened - No effect
- Bull trout – Threatened - No effect
- Coho salmon – Candidate - No jeopardy and if listed no effect
- Bald eagle - Threatened - No effect

- Humpback whale - Endangered - No effect
- Leatherback sea turtle - Endangered – No effect
- Steller sea lion - Threatened – No effect

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LIST OF ABBREVIATIONS AND ACRONYMS

ASC	Application for Site Certification
EFSEC	Energy Facility Site Evaluation Council
BE	Biological Evaluation
ESA	Endangered Species Act
USFWS	United States Fish and Wildlife Service
NMFS	National Marine Fisheries Service
PHS	Priority Habitat and Species
Corps	United States Army Corps of Engineers
MW	Megawatt
HRSG	Heat Recovery Steam Generator
ACC	Air-Cooled Condenser
mmgpd	Million gallons per day
BMP	Best Management Practice
SWPPP	Stormwater Pollution Prevention Program/Plan
SPL	Sound Pressure Level
dB	Decibel
GTG	Gas Turbine Generator
STG	Steam Turbine Generator
SCR	Selective Catalytic Reduction
NPDES	National Pollutant Discharge Elimination System
WWTP	Waste Water Treatment Plant
API	American Petroleum Institute
WDFW	Washington Department of Fish and Wildlife
WAC	Washington Administrative Code
TMDL	Total Maximum Daily Load
MLLW	Mean Lower Low Water
ESU	Evolutionarily Significant Unit
EFH	Essential Fish Habitat

1. INTRODUCTION

BP West Coast Products, LLC (BP), owner and operator of the BP Cherry Point Refinery, proposes to construct and operate a 720 Megawatt (MW) power and steam cogeneration facility (Cogeneration Project) adjacent to the Cherry Point Refinery (Refinery) near Blaine, Washington.

Several permits must be obtained to authorize construction and operation of the proposed Cogeneration Project, including a Clean Water Act Section 404 permit from the Corps authorizing the discharge of fill material in wetlands. Section 7 of the Endangered Species Act (ESA) requires the Corps to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) prior to issuing the 404 permit. This biological evaluation (BE) has been prepared to facilitate the consultation.

The Cogeneration Project represents a relatively small addition to the existing Refinery, which has been in operation at this site for over thirty years. The existing Refinery fence line will be modified and extended to include the new facility as an extension of the existing industrial area. The proposed facility's impacts to sight, sound, land use, and habitat are expected to be small and similar in character to those that exist in this industrial area today. The wildlife that use the area today have adapted to the sights and sounds of existing operations and except for a small change in the developed area next to the Refinery, should experience little change in their habitat as a result of the Cogeneration Project.

This BE has been prepared following Corps (Gossett 2001) guidelines and describes the following.

- The project's purpose, need, and alternatives, and the specific area that may be affected by the action.
- Listed and candidate species within the project area, their level of use of the area, and any designated or proposed critical habitats within the project area.
- The potential impacts of construction and project operation on listed species.
- Conservation measures for endangered and threatened species and critical habitats.
- Impacts to Essential Fish Habitat.

2. PROJECT DESCRIPTION

2.1 Facility Need

The Cogeneration Project will produce steam and electricity for the Refinery and additional electricity for the regional market. The Refinery uses both steam and electricity in its refining operation, and needs a reliable source of both to maintain operations. During 2000 through early 2001, there was significant volatility in electricity prices due to a shortage in generating capacity combined with a lack of available hydroelectric power.

Electricity demand in the Western Electricity Coordinating Council (WECC) and Northwest Power Pool (NWPP) and has grown more than 50% and 43%, respectively over the period 1982-1998. While demand can fluctuate from year to year, WECC and NWPP electricity demand growth is expected to continue over the 2002-2011 time frame. The Cherry Point Cogeneration Project can help meet this demand more efficiently than the most efficient stand-alone combined-cycle power plants.

2.2 Facility Purpose

To address the project need described above, the purposes for the Cogeneration Project are as follows:

- To provide reliable, efficient and cost-effective steam and electrical power to the Refinery.
- To provide efficient and cost-effective electrical power to the region.
- To minimize the Refinery's reliance on outside sources for electricity.
- To minimize impacts to the environment.

The key purposes are discussed in more detail below.

2.2.1 Efficient and Reliable Energy

Cogeneration is considered one of the most efficient methods of electricity generation from hydrocarbon fuels. Generally there are three types of fuels used for cogeneration facilities natural gas, coal, and other solid fuels such as municipal waste, wood waste or petroleum coke. Since a proprietary natural gas pipeline currently supplies the Refinery, and the other fuels would have greater environmental impacts and poorer reliability, BP chose a natural gas-fired cogeneration facility.

For reliability purposes, three gas-fired turbines are proposed for the Cogeneration Project each with a heat recovery steam generator (HRSG) that can provide steam directly to the Refinery or to the cogeneration unit's steam turbine. Having three gas turbines and HRSGs will ensure a continuous supply of steam and electricity to the Refinery, even if one gas turbine is off-line for maintenance and a second turbine shuts down unexpectedly.

The other fuel alternatives would have either greater environmental or operational impacts. A coal-fired fired facility would require the construction of a new rail spur and the facility site would require a significantly larger land area (coal storage areas) impacting more wetlands. In addition, the air quality impacts would be greater. A waste-to-energy facility would require a significant amount of waste (domestic, industrial and biomass) in order to meet the power and steam requirements. The cost for producing energy and steam would be greater than natural gas. In addition, the facility would have to rely on a continuous and uninterrupted source of waste material. To ensure that power and steam would be uninterrupted it is likely that gas, coal or diesel fuels would have to be provided as a supplemental fuel.

2.2.2 Regional Power

The Pacific Northwest also needs additional electrical generating capacity. During 2000 and 2001, the region experienced highly volatile electricity prices as well as supply curtailments. Current forecasts indicate the potential for future electricity shortages and concerns about system reliability. Extraordinary short-term actions during 2001 helped to significantly reduce electricity demand. In particular, the shutdown of aluminum smelters reduced demand by approximately 2,500 MW and helped alleviate the critical near term shortage in the Northwest. These actions resulted in the loss of hundreds of jobs in the Northwest. However, the construction of additional generation capacity is still needed to address long-term demand for additional power.

Availability of power in the Northwest is related to the amount of water available to generate hydroelectric power and in times of drought conditions utilities and industries are required to purchase expensive out of region power, if available. This significantly affects the cost and reliability of power available to continue Refinery operations.

2.2.3 Self Reliance

Currently, all of the electricity used at the Refinery, approximately 85 MW, is either purchased from the Mid-Columbia power market or transmitted to the Refinery by Puget Sound Energy (PSE). PSE currently owns and operates the transmission line and associated facilities that supply purchased electricity to the Refinery. BP had previously considered a direct connection to the Bonneville Power Administration (BPA) transmission system to supply the Refinery and obtained a 404 wetlands permit to construct a transmission line (COE permit number 1998-4-02349) from the proposed project site to the BPA transmission line. The BPA transmission line is approximately 0.8 miles from the project site and is on BP property.

2.3 Facility Description

The Cogeneration Project will integrate operations with the Refinery to increase efficiency and reduce the consumption of and impacts to natural resources. Figures 3A and B illustrate this integration. The Cogeneration plant will supply steam and electricity to the Refinery, which will in turn recycle hot condensate and return boiler feed water back to the Cogeneration Project. The Cogeneration Project will allow the Refinery to discontinue the use of older, less efficient boilers for steam generation and to make other modifications to reduce emissions. These actions are expected to result in a

net reduction in the total criteria pollutant emissions from Cherry Point. The proposed Cogeneration plant will be fueled by natural gas and will not use backup fuels.

The Cogeneration Project will generate a nominal 720 megawatts (MW) of electric power and export high-pressure process steam and intermediate-pressure steam to the Refinery. Of the 720 MW, the Refinery will use approximately 85 MW. The remainder will be exported via a new 230-kV transmission line that will connect the power plant to an existing 230-kV Bonneville Power Administration transmission line (See Figure 4, Project Site Plan).

Major components related to the power generation plant are:

- Three combustion turbine generators
- Three heat recovery steam generators
- One steam turbine electrical generator
- One cooling tower with 12 cells (2x6 arrangement)
- Electrical switchyard, with a connection to the Refinery and BPA transmission system
- 230-kV transmission line
- Natural gas compressor station

Water for use in the Cogeneration Plant will be obtained from three sources; first, the majority of the water needed for cooling in the cogeneration plant will be obtained from the Alcoa aluminum smelter located approximately 4 miles to the south. Alcoa uses approximately 4.0 million gallons per day (mmgpd) for non-contact once through cooling. The water is currently routed to Alcoa's wastewater treatment system and discharged to the Strait of Georgia. Because this 4.0 mmgpd of cooling water is not contaminated when it leaves the Alcoa plant, it will be routed into the existing water line that currently feeds the BP Refinery. The water that BP will receive from Alcoa will be clean Whatcom County Public Utility District No. 1 (PUD) water that is about 5° F warmer than it was before it entered the Alcoa facility. The second source of water for the Cogeneration Plant will be water returned from the Refinery in the form of hot condensate and boiler feed.

On an annual average basis, the Cogeneration unit will use approximately 0.7 mmgpd less water than will be recycled from Alcoa. “Leftover" recycled water from Alcoa will be routed to the Refinery. This will reduce the Refinery’s fresh water demand. As a result of the water recycling, the Cogeneration Plant, the Refinery, and Alcoa will use less water on average than the Refinery and Alcoa currently use.

2.4 Facility Alternatives

A comprehensive alternatives analysis was prepared to meet the Washington State Energy Facility Siting Evaluation Council (EFSEC); State Environmental Policy Act (SEPA), the National Environmental Policy Act (NEPA); and the Clean Water Act 404 (b)1 requirements (Appendix B). The alternatives analysis, as required by Section 404(b)(1) of the Clean Water Act, evaluated alternatives to the location and configuration of the generating facility and the construction laydown areas. Impacts

related to the transmission line will not be addressed since they were subject to a previous permit action and mitigation.

The site and configuration described in this document was selected as the preferred alternative based on a project site location alternative selection process. In addition to evaluating the proposed action versus the no action alternative, BP also evaluated five alternative sites for the Cogeneration Project based on the following criteria:

- Sufficient acreage available
- Proximity to the Refinery and site size
- Avoidance or minimization of wetland impacts
- Proximity to infrastructure (roads, pipelines, and transmission lines)
- Potential for other environmental impacts
- Security

In addition to the Cogeneration Project site, several potential construction laydown areas were evaluated based on the following criteria:

- Proximity to the Proposed Plant Site
- Site Access
- Avoidance of Impacts to Wetlands
- Avoidance of Other Environmental Impacts

2.5 Facility Location

The Cogeneration Project site is in Whatcom County, approximately 7 miles south of Blaine and 6 miles northwest of Ferndale, Washington (Figures 1 and 2). The site is within the Cherry Point area that is zoned for "Heavy Impact Industrial" development. The project site geographic coordinates are as follows:

- T39N, R1E, Section 8
- Latitude 48°53.252' N, longitude 122°43.266' W

The Cogeneration Project is located wholly within Washington State Water Resources Inventory Area 01, Strait of Georgia Independent Drainages (Williams et al. 1975).

The plant site and associated stormwater facilities are located on approximately 33 acres of unimproved land (See Figure 2), including approximately 11.88 acres of wetlands. Construction laydown (staging and assembly) areas and access roads will be located on approximately 36 acres, of which approximately 23.49 acres are wetlands.

2.6 Construction

The Cogeneration site is located on unimproved land owned by BP and is adjacent to the Refinery (Figures 1 and 2). The land prior to conversion to industrial land in 1969 was used for pasture and crop production. The Cogeneration plant site is relatively flat

(approximately 1 percent grade) and contains grasses, shrubs, and small trees (see Section 3.3, Baseline Conditions for more detail).

Initial activities upon mobilization will be a site survey and establishment of the field construction office, site parking, and laydown areas. Wetlands adjacent to the project site will be fenced off for protection.

The Cogeneration plant site will be cleared and graded and construction stormwater controls constructed. The slope will be designed to induce stormwater drainage during construction by sheet flow into a perimeter trench system for collection and disposal (see Section 2.6.1 Best Management Practices). Conventional construction equipment, including bulldozers, front-end loaders, trucks, tractor scrapers, and graders will be used for site preparation. To the extent possible, excavated material of acceptable quality will be retained on the site for reuse as backfill. It will be stockpiled in designated locations using appropriate erosion protection methods. Excess material to be removed from the site will be disposed of at an acceptable designated location.

After the initial cut and fill, a rough grading of the plant site will be performed. Access roads to the plant site from Grandview, Brown, and Blaine roads will be prepared and rough graded. Graded areas will be compacted, free from irregular surface changes, and sloped to drain. Temporary and plant perimeter roads, laydown and parking areas, and other work areas will be constructed with a gravel surface. The source of this gravel aggregate and sand material will be determined by the contractor but is expected to be from local permitted sources.

Areas to be backfilled will be prepared by removing unsuitable material and rocks. The bottoms of excavations will be examined for loose or soft areas. Such areas will be excavated fully, backfilled with suitable material, and compacted. Backfilling with gravel will be performed in a controlled manner in layers of uniform specified thickness to achieve the desired density. The contractor will supply fill materials from permitted local sources.

After site preparation and rough grading are complete, the contractor will install the piling and concrete foundations required for the support of the combustion and steam turbine generators, HRSGs, stacks, pipe supports, electrical equipment, and other miscellaneous equipment items, tanks, and support facilities. Pile-supported concrete foundations will be used to provide support for all major equipment items, major building columns, and pipe racks. Construction of these foundations will require the use of heavy equipment, including pile-driving equipment, excavation and backfill equipment, concrete-pumping equipment, and concrete-finishing equipment. In addition, light and medium duty trucks, air compressors, generators, and other internal combustion engine-driven equipment will be used.

The Cogeneration plant construction will commence with installation of underground systems, which include piping, sewers, duct banks, and grounding grid. After the installation of the underground systems and foundations, the excavated areas will be backfilled, compacted, leveled, and gravel-finished for installation of the aboveground portion of the facility.

At the completion of construction, the final grading of the surfaces will be performed. The roads, parking lot, and other designated areas in the power block, maintenance, and

warehouse areas will be paved, while the balance of the plant area will be finished with a gravel surface. Gravel surfacing will also be provided at the switchyard. All side slopes and embankments will be protected against erosion with landscaping or seeded with grasses common to the local area. Vegetation and trees will be planted between Grandview Road and the project site, and in the northern portion of Laydown area 2 to provide a visual buffer of the project from Grandview Road.

2.6.1 Construction Best Management Practices

The construction contractor may alter the construction sequence and the equipment used in the course of managing the project. However, Best Management Practices (BMPs) will be followed regardless of the sequence of events. BMPs for construction work on-site are described in the following paragraphs.

The contractor will prepare a Stormwater Pollution Prevention Plan (SWPPP), which will be developed prior to site preparation activities, and will use the erosion control measures in the plan (see Section 2.6.1, Best Management Practices). The SWPPP will be submitted to the Washington State Energy Facility Site Evaluation Council (EFSEC) for review and approval prior to any onsite construction. Erosion control measures may include such items as silt fences, straw bales, fabric/jute mats, rock bases, temporary water conveyance structures, and detention basins and ponds. The plans will be coordinated as applicable with the existing Refinery programs. During construction, dust will be controlled as needed by spraying water on dry, exposed soil. Work areas will be organized and cleaned as necessary.

The proposed site is relatively flat with an undulating, hummocky surface. Water that does not infiltrate directly into the ground runs off toward the north and west. Construction activities will consist of clearing, grading, and general construction, as well as utilization of parcels of land for laydown areas for equipment. Stormwater drainage during construction will be divided into two general areas. During construction, silt fences, gravel bags, drainage swales, and ditches will be used to control the flow from the work area to prevent adverse sedimentation or erosion to the undisturbed areas adjoining the site.

Drainage basins contributing to proposed stormwater discharge locations were delineated based on topography and existing conditions. For the area to the east of Blaine Road, several sub-drainage basins exist that will not be disturbed or affected by construction or operational activities and are designated as 'non-impacted areas' (Figure 6A). Non-impacted areas are and will be during construction, drained by diversion ditches that convey clean stormwater runoff around the impacted areas.

The area east of Blaine Road and south of Grandview Road includes several drainage areas, designated as Drainage Areas (DAs) 1, 2, 3, 4, and 5 (Figure 6A). The area to the west of Blaine Road and south of Grandview consists of construction parking and laydown areas for both construction and operational phases and includes DA 6.

Drainage Areas 1, 2 and 3

DAs 1, 2, and 3 are non-impacted drainage areas. The runoff from DA 1 will be conveyed to diversion ditches D-1 and D-2 (Figure 6A). These ditches convey water to ditch D-3, which also collects water from DA 2. DA2 also contributes water to ditch D-5. Ditch D-3 conveys water to the intersection of ditch D-5 and ditch D-6. Ditch D-6 also collects water from DA 3. Ditch D-6 runs along the east side of Blaine Road and discharges through an existing culvert under Grandview Road. The culvert will not be changed. Ditches D-3, D-5, and D-6 are existing ditches.

Drainage Areas 4 and 5

DAs 4 and 5 consist of building (plant) areas and laydown areas, and stormwater draining from these areas will potentially require treatment (Figure 1A). Stormwater from DAs 4 and 5 will be routed to ditches C-2 and C-3, respectively. These ditches will convey flows to an oil/water separator from which water will be discharged to Detention Pond 1 for further treatment, detention, and flow control. Water discharged from Detention Pond 1 will then be routed through a buried pipe running along the south side of Grandview Road to the west. The pipe crosses under Blaine Road, then heads north, and crosses north under Grandview Road, approximately 200 feet to the west of Blaine Road. The pipe will discharge into a newly constructed wetlands mitigation area to the north of Grandview Road.

Drainage Area 6

DA 6 consists of laydown and parking areas. All water draining from DA 6 will be routed to ditch C-4, which bisects DA 6. Ditch C-4 conveys water to ditches T-5 and T-6 that will convey water to a second oil/water separator (Figure 1A). Water discharged from this oil/water separator is conveyed to Detention Pond 2 for additional treatment and detention and flow control. Water released from Detention Pond 2 will be discharged into an existing channel that will deliver the flow to existing duck ponds.

The Cherry Point Refinery (then owned by Atlantic Richfield Products, Inc.) and Ducks Unlimited constructed the duck ponds several years ago. They have no engineered parameters. They receive storm water from the existing drainage system. It is unlikely that BP, Ducks Unlimited, or the Washington Department of Fish and Wildlife that designed the duck ponds calculated a specific storm event or amount of stormwater that would over top the berms and release water down gradient.

As described above and in the section on plant operation, the duck ponds will receive treated overflow water from the cogeneration plant construction and other new features. The detention ponds for the Cogeneration Project are designed to regulate the discharge to mimic the existing system. Thus, water going into the duck ponds should be no different than in the past.

The detention ponds were sized using predicted post-development runoff values as provided in the most recent stormwater management guidelines by Ecology. Prior to entering Terrell Creek, stormwater from the detention ponds will meet State of Washington surface water standards for Class AA waters in order to be compatible with receiving waters. Peak stormwater flows were calculated and the results of this analysis are shown in Table 3. The detention ponds will provide both static storage volume to allow settling of suspended solids, and dynamic storage to limit the peak discharge to pre-development values. The deepest 3 to 4 feet of the ponds provide the static storage volume, while the upper 2 to 3 feet provide flow-control storage. The discharge rate is controlled by the diameter of the outlet pipe.

2.6.2 Construction Schedule, Sequence, and Activity Time Requirements.

Construction of the Cogeneration Project would take approximately 23 months. Details of the anticipated preliminary construction schedule for Cogeneration Project are presented in Figure 4.

2.7 Operations

2.7.1 Air Emissions

Air quality impact studies were performed for the Project to evaluate projected ground-level pollutant concentrations, the potential effect on the public health and welfare, the effect that the emissions would have on soils and vegetation, odors, and the potential effects associated with visibility at National Park Service (NPS) and U.S. Forest Service (USFS) designated sensitive areas. The nearest NPS or USFS sensitive area is the North Cascades National Park (50 miles) with other areas listed below with their straight-line distances from the proposed project site:

- Olympic National Park (62 miles)
- Glacier Peak Wilderness Area (71 miles)
- Pasayten Wilderness Area (90 miles)
- Alpine Lakes Wilderness Area (109 miles)

The proposed Cogeneration Project will enable BP to shut down existing boilers and make other modifications to reduce criteria pollutant emissions at the Refinery. The remainder of this section discusses air emissions from the proposed Cogeneration Project without reference to offsetting emission reductions at the Refinery.

The Project will result in the emission of criteria pollutants such as particulate matter (PM_{10}), oxides of nitrogen (NO_X), carbon monoxide (CO), sulfur dioxide (SO_2), volatile organic compounds (VOCs), some toxic air pollutants (TAPs) and a variety of other air emissions from the combustion of natural gas. Combusting only natural gas in the combustion turbines and duct burners will minimize emissions associated with proposed operations.

Each of the combustion turbines will be equipped with lean pre-mix dry low-NO_X combustors. These combustors have been developed to minimize the formation of NO_X. Selective Catalytic Reduction (SCR) catalyst beds and ammonia injection grids for the control of NO_X emissions will be installed in each of the HRSGs as well as catalytic oxidation beds for the control of CO emissions. The CO oxidation catalyst will also control some of the VOC emissions. The use of natural gas as fuel, good combustion controls, and good operating practices will minimize emissions. Sulfur dioxide will be controlled through the use of natural gas, which is inherently low in sulfur.

All of the projected cogeneration facility impacts are well below respective U.S. ambient air quality standards. In fact, effects would be even less than modeling results indicate, because the modeling did not take into account the emission reductions at the Refinery as a result of the Cogeneration Project. Dispersion modeling also indicated that even without consideration of the Refinery emission reductions, the Cogeneration Project's emissions will not cause any significant change in air quality in Canada and will not cause Canadian air quality objectives or standards to be exceeded. The analysis also indicates that the operation of the Cogeneration Project will not cause any significant (greater than 5 percent) degradation in the air quality levels or visibility at any of the sensitive NPS or USFS areas.

2.7.2 Sound Emissions

Operation of the Cogeneration Project will result in sound emissions, which will be substantially similar to the existing background sounds in the area. Golder Associates Inc. performed a comprehensive noise study to assess the existing (background) ambient noise levels in the project area. The study measured the background noise levels at 15 receptor locations to the north, east, and west, of the project site. Hessler Associates then performed additional background monitoring and used a computer model to predict the noise levels associated with the revised design and configuration of the Cogeneration Project. (Hessler Associates, 2003).

All modeled noise levels, as produced by the Cogeneration Project, would be well below regulatory thresholds. The modeling also indicated that the Cogeneration Project will not result in a significant increase in noise compared to existing conditions.

2.7.3 Wastewater

When the proposed Cogeneration Plant is operating, stormwater and industrial wastewater will be generated as separate streams and treated appropriately. The following sections described the drainage and treatment of this wastewater.

2.7.3.1 Stormwater

Regulatory requirements for stormwater treatment and discharge were presented in a report prepared by Golder (2001b). A SWPPP will be prepared for plant operations and will describe operational and source BMPs, spill control plans, and emergency response procedures. A summary of the proposed stormwater drainage for operational activities is described below (see Figure 6B). The purpose of this stormwater system design is to enhance wetland conditions that exist north of Grandview Road and west of Blaine Road and is included as part of the mitigation plan for wetland impacts at the project site. This plan meets the objectives of the Department of Ecology and the Corps of Engineers.

Drainage Areas 1, 2 and 3

Drainage for DAs 1, 2, and 3 will remain the same as during construction. Stormwater from these unused areas will be discharged into the Blaine Road ditch leading to Terrell Creek.

Drainage Area 4 and 5

Stormwater drainage for DA 4 (the plant site) will remain the same as during construction activities. After treatment, this water will be discharged to the wetland mitigation area north of Grandview Road and east of Blaine Road (Figure 1B).

A portion of DA 5 east of Ditch C-1 (Figure 1B), referred to as Laydown Area 4, will be restored to natural conditions. Stormwater from this area will be considered non-impacted, routed to a new clean water diversion ditch, and discharged north of Grandview Road through the existing culvert with drainage from DAs 1 through 3. Stormwater from the remainder of DA5 will be combined and treated with the drainage from DA 4.

Drainage Area 6

The northern portion of DA 6 will be converted to wetland. Associated ditches T-5 and T-6 will be relocated approximately 200 feet to the south. The flow path of water will remain the same. The new wetland area north of DA 6 and south of Grandview Road will receive a portion of the flows from ditch D-6, which drains the non-impacted areas surrounding the plant site. A control weir located on D-6 will regulate the flow. A new culvert will convey non-impacted stormwater flows under Blaine Road.

2.7.3.2 Industrial Wastewater Treatment and Discharge

In addition to stormwater, the Cogeneration plant will generate and discharge four wastewater streams from the following sources:

- Treatment of raw water to produce high quality boiler feedwater (BFW) and Refinery return condensate treatment;
- Collection of water and/or other minor drainage from various types of equipment;
- Cooling tower blowdown; and
- Sanitary waste collection.

Of these four wastewater streams, the first three will be combined and routed to the Refinery wastewater treatment system. This combined stream will have the estimated initial physical and chemical characteristics listed in Table 1. This wastewater will be combined with the Refinery NPDES wastewater stream and discharged through the Refinery NPDES discharge point at the BP marine terminal. Sanitary wastewater will be routed to the Birch Bay Water and Sewer District (District) wastewater treatment plant for treatment and discharge.

Net process wastewater from the Cogeneration Project to the Refinery wastewater treatment plant will be 190 gallons per minute (gpm), assuming 15 cycles of concentration in the cooling tower. (Table 1). An analysis of the proposed wastewater that would be produced by the Cogeneration facility shows that the Refinery wastewater treatment system has the capacity to treat the facility's wastewater with negligible impacts.

Industrial process wastewater will be routed to the Refinery and combined with the Refinery wastewater. Table 2 presents a numerical analysis of the potential impact of the Project wastewater on the Refinery's wastewater stream. Cogeneration Plant wastewater

would be co-mingled at the head of the Refinery wastewater stream and treated with the wastewater in the Refinery treatment system. The impact analysis is based on the average discharge from the Refinery over the months of July, August, and September 2001.

In the Refinery wastewater treatment plant (WWTP), wastewater receives both mechanical and biological treatment to eliminate impurities. It is initially treated to adjust to a pH of 7 to 8, and is then routed to American Petroleum Institute (API) separators, where decreased velocity allows any oil to float and solids to settle. Oil is skimmed off and recovered for reprocessing and solid material (sludge) is collected and recycled.

Water from the API separators is pumped to an equalization surge tank. The surge tank meters the flow rate, creating a more constant flow to the aeration basin where biological treatment takes place. During this processing phase, microorganisms consume trace hydrocarbons that remain in the water after mechanical separation has taken place. Six fixed and two floating surface aerators are used to force additional oxygen into the solution, and steam spargers are used to control temperature to provide an environment for the bacteria that is amenable to maximum consumption of contaminants.

Aeration basin effluent is a mixture of water and bacteria that flows to the clarifier for separation. Bacteria settle out and form a biological sludge, which is returned to the aeration basin or pumped to a de-watering unit as a waste product. The clarified water flows to two clarification ponds that are arranged in series providing residence time. These ponds allow additional settling of suspended material. The water leaving the second clarification pond flows into an outlet pipe and a gravity aerator prior to entering the final holding pond.

The final holding pond provides another opportunity for the settling of solids. After traveling the length of the pond, the final effluent is discharged from the Refinery's NPDES – permitted offshore outfall. Continuous sampling and testing of the final effluent verifies that it meets all requirements established by the Washington State Department of Ecology in the NPDES permit program before it is discharged to marine receiving waters.

3. DESCRIPTION OF THE STUDY AREA

3.1 Action Area

The area where direct or indirect effects could potentially affect a species or critical habitat defines the "action area." The following factors were considered in defining a project action area:

- Construction activities
- Completed project footprint
- Construction and operational air emissions
- Construction and operational noise emissions
- Construction and operational stormwater and operating industrial wastewater discharge

Except for stormwater and wetland mitigation activities, construction activities will be confined to the facility site and the laydown areas. As described previously, treated stormwater from the impacted drainage areas will be discharged into naturally occurring and constructed wetlands north of Grandview Road. After a residence time, water from these wetlands could flow into Terrell Creek and subsequently into Birch Bay (Figure 1). Discharged stormwater quantities and quality will be controlled to maintain conditions equivalent to existing flows. Because of the lack of a direct connection to Terrell Creek, the creek and Birch Bay are not included in the project action area.

As discussed in previous sections, air and noise emissions from the proposed project are not expected to have significant environmental effects. Modeling studies for both air and noise emissions show that the proposed Cogeneration Project will not result in significant changes to the existing environment in the vicinity of the Refinery and proposed project site. In addition, the project is expected to result in a decrease in total emissions of criteria pollutants because steam generation from older boilers within the Refinery will be taken out-of-service.

Industrial wastewater from the proposed Cogeneration plant will not be discharged directly into existing surface waters. This class of wastewater will undergo treatment with the Refinery's NPDES wastewater stream. It is unlikely that industrial wastewater from the Cogeneration Plant combined with that from the Refinery (see Section 2.7.3.2) would impact marine receiving waters. The overall increase in wastewater loading from the Cogeneration Project will be approximately 190 gpm (assuming 15 cycles of concentration in the cooling tower) or 8 percent, which is less than the current daily average wastewater flow fluctuation at the Refinery's NPDES outfall.

Thus, the project action area includes the completed project footprint, construction laydown areas, and drainages connecting these areas to existing and constructed wetlands. That part of Terrell Creek and the marine waters downstream of the project site are not included in the project action area because they will not directly or indirectly receive treated or untreated stormwater from the project site and adjacent areas. The project footprint consists of the 33-acre plant site, 36-acre construction laydown area, and the area in which stormwater will be treated as shown on Figures 6A and 6B.

3.2 Existing Developments

Within the study areas, the largest existing development is the BP Cherry Point Refinery, which has been operating continuously since 1971. Additional existing developments near the study action area as defined above include the following:

- Puget Sound Energy's Point Whitehorn Generating Plant,
- PRAXAIR's CO_2 liquefaction plant,
- Chemco's wood treating plant,
- Several rural single-family residences
- Cattle ranching, and
- Dairy farm.

3.3 Baseline Conditions

3.3.1 Terrestrial and Wetlands

The proposed Cogeneration Project site was used for agricultural purposes for many decades, but for at least thirty years has been owned by BP and is zoned Heavy Impact Industrial. Vegetation within the proposed plant site and access road location consists primarily of a mixture of upland and herbaceous wetlands. The vegetation of the upland areas within the proposed plant site is composed of herbaceous, shrub and tree components (Table 4). Herbaceous areas are dominated by mostly non-native facultative species that are also found in adjacent wetlands. These species include Canada thistle, bentgrass, reed-canary grass, velvetgrass, bird's foot trefoil, bull thistle, and horsetail. Shrub-dominated uplands are composed of both Himalayan and evergreen blackberry. Forested areas within the project site are primarily hybrid poplar trees that were planted in 1990 for future harvest as pulp wood. Forested uplands adjacent to wetlands are composed of alder, Douglas-fir, western red cedar, and Alaska cedar. Alder trees are located within drainage ditches in the middle section of the site.

The National Wetland Inventory (NWI) map (U.S. Department of Agriculture, 1987) for Blaine, Washington USGS Quadrangle indicates that the area is almost entirely dominated by palustrine emergent (PEM) and forested (F) wetlands (Appenidx C). NWI maps indicate that isolated palustrine emergent (PEM) wetlands exist within slightly depressed topographic areas because of glacial movement and a dense clay layer underlying the A-layers of soil. These wetlands are both seasonal and persistent.

Wetlands in the area were assessed using wetland delineation protocols published by the Corps of Engineers and functions and values assessment protocols published by the Washington Department of Ecology (1999b). The wetland systems within the proposed project site occupy approximately 35 percent of the 33-acre project site, and approximately 67 percent of the 36-acre laydown areas. Taken together the Cogeneration Project site and the laydown areas will impact 35.37 acres of wetlands. Of that total, 4.86 acres will be disturbed temporarily, and 30.51 acres will be filled permanently. To minimize impacts, wetland delineations or reconnaissance surveys were conducted on over 200 acres on and in the vicinity of the proposed project site.

The current site layout was chosen to minimize the impact to the wetland systems and maintain the hydrologic character of the site.

As shown in the assessment, the wetlands function at low levels for groundwater recharge, nutrient and toxicant removal, and downstream erosion and peak flow attenuation. This is likely due to the slow permeability of the soils and the relatively undisturbed nature of land use up gradient of the wetlands. Several man-made drainage ditches traverse the property. These ditches were likely used when the land was farmed to remove excess water from the soils in winter and spring by increasing runoff rates from adjacent wetlands. These ditches are not functioning as originally intended because they have not been maintained and are partially vegetated. Vegetation in the ditches inhibits surface water flow and decreases the removal of water from wetlands. The wetlands function as producers and exporters of primary production biomass due to the drainage outflow afforded by the ditches, but this function is likely at a low level because the ditches have not been maintained.

The wetlands function on a very low level for wetland dependent species (e.g., birds, invertebrates, and amphibians). In addition, the wetlands do not provide resident and anadromous fish habitat as there is no open water and the drainage ditches only serve as a hydrologic connection to open fields and overland flow into Terrell Creek in times of high rain flow.

3.3.2 Terrell Creek

Stormwater will not be discharged directly or indirectly into Terrell Creek from the proposed Cogeneration Project. Terrell Creek and its aquatic habitats are beyond the point were effects of discharges from the Cogeneration project could be felt.

A description of the entire creek is provided for assessment of existing conditions. BP (URS Corporation, 2001) evaluated Terrell Creek for the purposes of impact evaluation and mitigation potential on June 20-21, 2001, and June 27-28, 2001.

Terrell Creek is an 8.7-mile-long stream that discharges to Birch Bay. The creek channel dimensions, riparian vegetation, and in-stream conditions change significantly along this length. From the railroad tracks north of Pleasant Road near the existing Refinery (Figure 1) to approximately mid-way between Blaine Road and Jackson Road, the stream has a 0.5 to 2 percent gradient, a cobble and gravel substrate, and deep shading by mature riparian forest. Channel width ranges from 3 to 8 feet. The floodplain is narrow (2 to 10 feet between banks) in most locations, but appeared to contain some wetland areas. Water was flowing at 0.2 to 1.5 feet per second (fps) and was 2 to 7 inches deep at the time of the URS survey. An estimated discharge rate was approximately 1.5 cubic feet per second (cfs). This portion of the stream has excellent water clarity and flows over a coarse substrate suitable for aquatic flora and fauna adapted to lotic conditions. The side-slopes that contain the riparian zone of the upper section range in grade from 10 to 80 percent, but are typically 15 to 50 percent. The banks are 20 to 50 feet higher than the surface of the stream and are typically 90 to 140 feet in length. Some bank undercutting is present, but banks appear stable.

The lower section from mid-way between Blaine Road and Jackson Road to the west edge of the survey area (south of Birch Bay State Park) has a 0 to 0.5 percent gradient, a silt substrate, and little shading from adjacent vegetation. Channel width in this section

ranges between 3 and 15 feet. The floodplain is 120 to over 200 feet wide in most locations and is entirely composed of wetland that is seasonally flooded and saturated during other times (URS Corporation, 2001).

Water was flowing at 0 to 0.1 fps and was approximately 2 to 6 feet deep at the time of the URS survey. Since the water was flowing so slowly, no discharge rate could be estimated. Water clarity was low to moderate; turbidity permitted visibility to only a few inches depth below the water surface. No fish were observed in this portion of the creek. This portion of the stream flows over a fine substrate suitable for aquatic flora and fauna adapted to lentic (slow water) conditions. The riparian side-slopes of the lower section are typically 15 to 50 percent grade and 10 to 15 feet above the water surface. No bank undercutting or indications of bank instability were observed.

Terrell Creek and Birch Bay into which the creek drains are not specifically classified by the State of Washington. Both water bodies should be considered as Class AA surface waters, because the Washington Administrative Code (WAC), Chapter 173-201a states:

> ***WAC 173-201A-120 General classifications.*** *General classifications applying to various surface water bodies not specifically classified under WAC 173-201A-130 or 173-201A-140 are as follows:*
>
> *(6) All unclassified surface waters that are tributaries to Class AA waters are classified Class AA. All other unclassified surface waters within the state are hereby classified Class A.*

> ***WAC 173-201A-140 Specific classifications -- Marine water.*** *Marine surface waters of the state of Washington are classified as follows:*[1]
>
> *(14) Mukilteo and all North Puget Sound west of longitude 122°39' W (Whidbey, Fidalgo, Guemes and Lummi Islands and State Highway 20 Bridge at Deception Pass), except as otherwise noted. Class AA.*

In addition, neither Terrell Creek nor Terrell Lake is included on Ecology's section 303(d) list of impaired waters. There are no total maximum daily load plans or other water quality limitations established for these waters.

However, water quality in the creek and its Birch Bay estuary is poor at times and does not meet State of Washington standards for Class AA, Excellent waters (*dissolved oxygen shall exceed 9.5 mg/L*; WAC 173-201A-030) because of low dissolved oxygen levels and relatively high temperatures (Huddle, 2002; Pizzillo, 2002a and b). Low water quality resulted in a fish kill in June 2002 (Pizillo, 2002a), and has been documented in a study by the Nooksack Salmon Enhancement Association (NSEA) (Pizzillo, 2002b; NSEA, 2002).

Stormwater from the Cogeneration Project site during heavy rainfall events currently enters Terrell Creek through the Blaine Road ditches (east and west sides of the road). The confluence of the ditches and Terrell Creek was recently (July 11, 2002) examined (Mazer 2002). The ditch is riprapped for most of its length along the east side of Blaine Road. It contains enough soil in some spots to support hydrophytic plants. The west side ditch leads to a concrete culvert that is approximately 3 feet in outside diameter that

[1] Internet address: http://www.leg.wa.gov/wac/index.cfm?fuseaction=chapterdigest&chapter=173-201A, last update 11/18/1997.

crosses under Blaine Road south of Terrell Creek and connects with the east side ditch . The culvert and ditch discharge northeast through a narrow thicket of Himalayan blackberry and a mature deciduous, broad-leaved riparian forest on the Terrell Creek floodplain. The culvert is closed for its first 30 to 40 feet (Figure 7). This portion of the culvert is on a 20 to 40 percent slope. The open portion of the culvert extends another 20 to 30 feet down the slope. A 2 to 3 - foot gap in the culvert occurs near the base of the slope where the culvert is broken.

Most runoff appears to flow on the slope of the ditch at the confluence, which is moderately eroded, but apparently stable. Runoff continues along the 20 to 30 - foot stretch of culvert that lies down slope of the gap. The runoff then continues another 10 feet before reaching Terrell Creek. This area is more gently sloped (less than 5 percent) and has a gravel and sand substrate. It also appears stable.

Runoff in the ditch is seasonal. Flow appears to be approximately 1 cfs for most of the winter, but probably increases to more than 2.5 cfs during storm events. Very little or no flow occurs during the summer. No flow was observed during the time of the July visit, but a 10 – foot long stretch of shallow standing water was present in the ditch.

According to WDFW and the NSEA (2002), anadromous and resident fish species occurring in Terrell Creek include coho salmon (*Oncorhynchus kisutch*), searun cutthroat (*Oncorhynchus clarki*), resident cutthroat (*Oncorhynchus clarki*), and winter steelhead (*Oncorhynchus mykiss*). However, WDFW regional habitat biologists (Warinner, 2002; Huddle, 2002) and the NSEA have found only coho and cutthroat juveniles in the stream. Adult spawning activities by either species have not been observed. In addition, numerous spiny ray fish (e.g., large-mouth bass) were found in smolt traps and observed during surveys.

Mr. Robert Warriner of WDFW (January 3, 2002) stated, “Pete Castle of WDFW told me that several years ago there was observed spawning of Chinook.” This statement was in reply to a request for information about salmonid use of Terrell Creek. A date or other details on the “observed spawning” could not be obtained from WDFW. When asked about the use of Terrell Creek by chinook, both Huddle (2002) and NSEA (2002) discounted any consistent use of the creek for spawning or other purpose (e.g., feeding by strays) by chinook. Both sources stated that they had never observed chinook salmon in Terrell Creek. Huddle suggested that the chinook occurrence might have been due to unauthorized planting by private citizens.

Huddle (2002) indicated that “incidental use by native char” such as bull trout (*Salvelinus confluentus*) or Dolly Varden trout (*Salvelinus malma*) is possible due to straying by fish returning to the Nooksack or Fraser rivers. However, this use would be limited to feeding since Terrell Creek does not offer suitable habitat for spawning by these trout. In addition, these fish with other salmonids in Terrell Creek would be at risk from poor water quality (e.g., Pizillo, 2002a; NSEA, 2002).

3.3.3 Marine Waters

The marine waters receiving the treated wastewater from the BP Cherry Point Refinery under its current NPDES permit would also receive the combined treated wastewater from the proposed Cogeneration Project. As discussed previously, combined effluent flows will not be significantly larger than existing discharges. The marine environment

outside the existing NPDES mixing zone is beyond the point were effects of discharges from the Cogeneration project could be felt.

A description of the marine receiving waters is provided for assessment of existing conditions. The receiving marine environment was recently described in an ESA BE (Berger/ABAM, 2000). The following description of marine baseline conditions is taken from that BE.

Where suitable substrate is present (e.g., rocks for macroalgae attachment), submerged marine vegetation extends from the middle intertidal zone down to about 30 feet below mean lower low water (MLLW). Eelgrass (*Zostera marina*) is present on both sides of and under the BP Refinery pier but extends to only approximately 6 feet below MLLW due to chronic natural turbidity and mobile sediments. Thus, the seafloor within the NPDES chronic dilution zone does not support submerged marine vegetation, as this area is approximately 35 to 90 feet below MLLW. However, kelp (*Nereocystis luetkeana*) and other macroalgae have been reported attached to the piling supporting the Refinery pier within the chronic dilution zone.

Nearshore habitats and characteristic species near the wastewater discharge are typical of those found along the Cherry Point shoreline. The seafloor habitat within the industrial wastewater chronic dilution zone is silty gravelly sand sediment with relatively strong tidal currents (1 or more knots during maximum ebbs and floods). This habitat is characterized by a sparse epifauna.

The Cherry Point shoreline and the area around the BP Refinery industrial wastewater discharge support a variety of finfish, the most notable of which is the Pacific herring (*Clupea pallasi*). In addition to Pacific herring, surf smelt (*Hypomesus pretiosus*) use beaches north and south of Cherry Point for spawning from June through August.

A variety of salmonids is known to occur along the Cherry Point shoreline and in the vicinity of the BP Refinery pier. Large numbers of pink (*Onchorhynchus gorbuscha*), chum (*O. keta*), coho (*O. kisutch*), and chinook (*O. tshawytscha*) salmon have been found in the cobble habitats of the Cherry Point shoreline and in the protected eelgrass beds of Birch Bay. Juvenile sockeye salmon (*Onchorhynchus nerka*) were also found in Birch Bay, but were generally less abundant than other species.

Adult chinook, pink, coho, and chum salmon migrating to the Fraser and Nooksack rivers, Terrell Creek (coho only), and natal streams in Drayton Harbor can be expected to transit and feed along the Cherry Point shoreline.

Steelhead were not noted in any samples for the Cherry Point vicinity, nor were sea-run cutthroat (*Onchorhynchus clarki*) or other trout species. However, sea-run cutthroat stocks have been identified in several tributaries to the southeast Strait of Georgia. Because sea-run cutthroat are nearshore residents throughout much of their marine life and do not migrate extensively, they may be present in the Cherry Point vicinity year round.

A variety of flatfish is found in the Cherry Point area. Trawl data and scuba observations from the vicinity of the BP pier indicate that the flatfish populations in the potential indirect effects area consist mostly of juvenile fish.

The Cherry Point shoreline also supports a variety of marine birds and mammals. In addition, bald eagles (*Haliaeetus leucocephalus*) use the marine habitats along the Cherry Point shoreline for feeding.

A variety of marine mammals use the southeast Strait of Georgia. Mammals sometimes found along the Cherry Point shoreline include the following species:

Harbor seal	*Phoca vitulina*
Pacific harbor porpoise	*Phocoena phocoena*
California sea lion	*Zalophus californianus*
Gray whale	*Eschrichtius robustus*

Harbor seals use the rocky beaches for hauling out and pupping near Point Whitehorn. There are no known breeding or haulout sites for sea lions in the Cherry Point vicinity. The Cherry Point shoreline is generally unsuitable for sea lion haulout or use by whales because of the large areas of shallow water near shore.

4. LISTED AND CANDIDATE SPECIES

In June and November 2001 and in August 2002, Golder Associates Inc. requested lists of federally protected species within the project area from USFWS. In addition, Internet pages maintained by the USFWS and NMFS were studied to develop the list of threatened and endangered species. The following federally listed and candidate species that are known to or could occur within or near the project action area was compiled from these sources for the preparation of this BE:

- Chinook salmon (*Onchorhynchus tshawytscha*) – Threatened
- Chinook salmon critical habitat
- Coho salmon (*Onchorhynchus kisutch*) - Candidate
- Bull trout (*Salvelinus confluentus*) – Threatened
- Bald eagle (*Haliaeetus leucocephalous*) – Threatened
- Humpback whale (*Megaptera novaeangliae*) – Endangered
- Leatherback sea turtle (*Dermochelys coriacea*) – Endangered
- Steller sea lion (*Eumetopias jubatus*) – Threatened

In addition to listed species, identified "candidate" species are addressed in this BE. Candidate species are those that are currently under review for listing, but have no legal protection under the ESA.

4.1 Description of Species Status and Habitat

4.1.1 Chinook Salmon — Puget Sound Evolutionarily Significant Unit (ESU) and Critical Habitat: Threatened

Stray chinook salmon may occur in lower Terrell Creek as adults and juveniles. As discussed previously, Terrell Creek is not within the project action area as it will not receive direct or indirect stormwater or other discharges from the proposed plant. The nearest stream used by chinook salmon for spawning is the Nooksack River (Berger/ABAM, 2000, Williams et al., 1975) approximately 21 miles from the project site. Adult chinook salmon use offshore marine waters for feeding or during migration. Adult fish could be found around the mouth of Terrell Creek and Cherry Point from March through October, including both runs (Myers et al., 1998, Williams et al., 1975). Use of Terrell Creek by chinook salmon adults or juveniles has not been observed by WDFW (Huddle, 2002).

4.1.2 Coho Salmon — Puget Sound/Strait of Georgia ESU: Candidate

Coho salmon may use Terrell Creek for spawning (Williams et al., 1975). However, no actual spawning has been observed (Huddle, 2002). If spawning occurred, adult fish would be expected in Terrell Creek in November through January. Juvenile coho salmon would be expected in the nearshore waters off Cherry Point in March through July (Weitkamp et al., 1995).

4.1.3 Bull Trout: Threatened

Bull trout in Puget Sound streams exhibit four life strategies: anadromous, adfluvial (using lakes and streams), fluvial (moving between or among different stream systems), and resident (staying in one drainage for their entire life span). While there are no known populations of bull trout within the project action areas, it is possible that anadromous adult bull trout from the Nooksack River or Fraser River could conceivably use Terrell Creek for feeding (Huddle, 2002). However, Terrell Creek does not offer suitable spawning habitat for bull trout (Huddle, 2002).

4.1.4 Steller Sea Lion: Threatened

Steller sea lions use all of Washington's marine and estuarine waters for feeding and resting. Their typical habitat is rocky or mixed beaches in isolated areas that are used for haulouts and feeding (Everitt et al., 1980, Gardner, 1981). The nearest known haulout area used by Steller sea lions is on Sucia Island, approximately 9 miles southwest of the BP Marine Terminal (Berger/ABAM, 2000). The only other regular haulout site in the inland waters of the Puget Sound region known to be used by Steller sea lions is on Race Rocks in the Strait of Juan de Fuca. It is possible that sea lions may use offshore waters of Cherry Point for occasional feeding. They would be most likely to be present in the early fall to early spring.

4.1.5 Humpback Whale: Endangered

Humpback whale sightings are a common occurrence along the Washington outer coast, with occasional sightings in the Strait of Juan de Fuca (Everitt et al., 1980). There have been only two or three sightings in Washington inland waters in the last 10 years (Berger/ABAM, 2000).

4.1.6 Leatherback Sea Turtle: Endangered

Leatherback sea turtles are globally distributed and are recorded as far north as Alaska along the eastern Pacific coast (Mager, 1985, as cited in Cooke et al., 2000; Berger/ABAM, 2000). Sea turtles nest in tropical regions and only occasionally forage into more northern and colder waters. Sightings in Washington waters have been rare with only one or two unconfirmed sightings off the outer coast of Washington in the last 10 years. It is highly unlikely that this species would occur off Cherry Point because of the rarity of sightings in Washington waters and those sightings have been off the outer coast of Washington.

4.1.7 Bald Eagle: Threatened

Bald eagles primarily eat fish and sometimes feed on waterfowl and carrion (Watson and Pierce, 1998). Approximately 78 percent of an eagle's diet consists of fish, 19 percent of other birds, and 3 percent of mammals. As primarily fish-eaters, the birds usually nest within 1.6 miles of open water. Their home range in Washington averages 2.6 square miles (Watson and Pierce, 1998). Because of their reliance on fish, it is likely that eagles mostly use the Cherry Point shoreline rather than inland areas for foraging.

The WDFW PHS database identified several bald eagle breeding sites within 2 miles of the project site (WDFW PHS, 2002). The closest nest is located approximately 1.2 miles

northwest of the proposed Cogeneration Project site near Meridian Road and Birch Bay (Figure 1). Another nest is located approximately 2 miles southeast of the study area along the shores of Lake Terrell (WDFW PHS, 2002). In addition, eagles use the beaches and bluffs to the south for foraging.

Golder Associates observed no bald eagles on the proposed project site or within the immediate vicinity during approximately 12 days of wetland surveys. The proposed project site is located within an area zoned Heavy Impact Industrial (Whatcom County Code, 2001) and is adjacent to the BP Cherry Point Refinery. There are also no mature trees within the proposed plant site or construction staging areas. There are no snags or perches, no permanent open water, and no fish-bearing streams as the drainage ditches are seasonal and do not support resident fish populations. Thus, bald eagles likely do not use the action area for roosting or foraging.

5. ANALYSIS OF EFFECTS

5.1 Introduction

The analysis indicates there would be "no effect" from direct and indirect impacts on threatened or endangered species because of the construction and operation of the Cogeneration Plant. The types of effects that could result from construction and operation of the facility are described below and the recommended "effects" determinations for ESA species in the action area are provided in Section 7.

The effects analysis describes potential direct and indirect effects of the action on the protected species and critical habitat within the action area. Direct and indirect effects have distinctive meanings under ESA and are not the same definitions as under the National Environmental Policy Act (NEPA). Direct effects under ESA are defined as "effects that may result from the project that would directly affect a species." Indirect effects are defined as "effects that may result from the project that would occur at a later time."

5.2 Potential Direct Effects

The following potential direct effects from the construction and operation of the proposed Cogeneration Project are considered in this report.

- Accidental spills of petroleum products could occur in conjunction with machinery operation during construction.
- The physical process of site clearing and other construction activities would impact wetlands and other habitats on the proposed site.
- Air emissions from the proposed Cogeneration facility could affect habitats, vegetation, and listed species.
- Noise from construction and operation could disrupt the foraging activities of birds and mammals.
- Wastewater discharges could directly affect receiving wetland, stream, and marine habitats.

5.2.1 Accidental Spills

The Clean Water Act, 33 U.S.C. 1251, et seq., together with 40 CFR 112 establishes procedures, methods, spill response plans, equipment, and other requirements for equipment, to prevent the discharge of oil and other petroleum products from non-transportation-related onshore and offshore facilities into or upon the navigable waters of the United States or adjoining shorelines. The Cogeneration Project will be incorporated into the existing Refinery spill plan.

Risk of Spills During Construction

Diesel fuel, gasoline, motor oil, hydraulic fluid, brake fluid, and anti-freeze are used by construction machinery during construction. The contractor's responsibility will include implementation of spill control measures and training of all construction personnel and

subcontractors in spill avoidance. Training will also include appropriate response if spills occur, in containment, clean-up, and reporting procedures consistent with applicable regulations and Refinery practices.

The following storage will be located on-site during and after construction, each with a spill containment structure:

- Lubrication oil stored on-site will be contained in barrels, which will be stored in a secondary containment area to contain any spillage, or they will be stored in temporary warehouses;
- Construction refueling will be closely supervised to avoid leaks or releases. Should a spill occur during refueling, it will be properly cleaned up by the general contractor and reported. If fuel tanks are used during construction, the fuel tank(s) will be located within a secondary containment with an oil-proof liner sized to contain the single largest tank volume plus an adequate freeboard allowance for rainwater.
- Transformer oil will be pumped from a truck within a temporary secondary containment area to contain any spillage.

Risk of Spills During Operation

Petroleum products used on site during operation will follow the same guidelines as for construction. Additional measures planned during operation include:

- The following tanks hold diesel fuel oil for the emergency generator and fire water pump or lube oil for major rotating equipment. These tanks will be provided with secondary containment for spill control with adequate freeboard for rainwater.
    - The fire pump diesel fuel storage tank will be a horizontal tank with a capacity of approximately 460 gallons and dimensions of 4 feet diameter x 5 feet long.
    - The diesel generator diesel fuel storage tank will be a vertical tank with a capacity of approximately 1,500 gallons and with dimensions of 6 feet diameter x 8 feet high.
- The steam turbine lube oil storage tank will be a rectangular tank with a capacity of approximately 7,200 gallons and with dimensions of 24 feet long x 12 feet wide x 7 feet high. Depending on the supplier of the steam turbine, the electro-hydraulic control oil system may be integrated with the lube oil system or it may be a standalone system.
- One combustion turbine lube oil storage tank will be provided for each of the three CGTs. Each tank will have a capacity of approximately 6200 gallons and with approximate dimensions of 28 feet long x 10 feet wide x 4 feet high. These lube oil tanks are located inside the accessory module that is furnished as part of the CGT vendor scope of supply.

- Transformer Oil: Transformers will be installed within secondary containment areas that will hold the transformer's volume plus an adequate freeboard to accommodate rainwater.

- Anhydrous Ammonia Tank: A secondary containment area will be constructed around the ammonia tank that will contain 150% of the working volume. The additional containment is provided to accommodate water from a deluge spray system and rainwater.

- Caustic Tank: The caustic tank will be surrounded by a secondary containment area and sized with sufficient freeboard for rainwater.

- Acid Tanks: The two acid tanks will be located within a secondary containment area lined with an acid-proof coating and sized with sufficient freeboard for rainwater.

- Steam Cycle Chemicals: Oxygen scavenger, neutralizing amine, corrosion inhibitors and phosphate storage tanks are located indoors and will be contained in a curbed area sufficiently sized to contain the single largest storage tank.

- Cooling Tower Chemicals: These chemicals will be stored in vertical cylindrical tanks as described in Table 9.2-1 or in totes provided by the chemical vendor near the cooling tower in a curbed area sufficiently sized to contain the contents of the single largest storage tote.

- Oil-Water Sewer: The BP Cogeneration Facility will be provided with an oil-water sewer (OWS) system that collects selected equipment drains and rainfall and washdown runoff from within curbed areas that could carry trace oil. Collected drainage and runoff will be pumped to the existing Refinery treatment system. Table 9.2-1 lists the underground Oily Water and CGT Wash Water sumps that are included in this system.

5.2.2 Site Clearing and Construction

Construction of the proposed Cogeneration Project and access road will disturb 33-acres, including the permanent fill of which 11.91 acres is palustrine emergent wetlands. An additional 36 acres will be disturbed for the construction laydown areas, including the temporary disturbance of 4.86 acres and the permanent fill of 18.6 acres of emergent herbaceous wetlands. The construction laydown areas will be maintained for future Refinery maintenance activities. A Clean Fuels Project under development at the Refinery will take the space currently used for Refinery maintenance activities. Thus, the Refinery would develop this area for maintenance activity laydown activities anyway.

Impacts to wetlands caused by installation of the transmission line have been previously permitted (COE Permit # 1998-4-02349). An enhancement of 4.1 acres of emergent wetlands has been implemented north of Grandview Road as mitigation for associated impacts.

The proposed plant construction and access road will affect approximately 23 acres of upland vegetation. The construction laydown areas will affect approximately 13 acres of upland vegetation. As described previously in Section 3.3, Baseline Conditions, upland

vegetation is largely composed of non-native species, herbaceous species, and Himalayan blackberry thickets.

5.2.3 Air Emissions

Air emissions from the Cogeneration Project will exit through three individual 150-foot tall, 18-foot diameter HRSG stacks.

A variety of air quality studies were performed using approved air quality analyses methodologies and approved air quality dispersion models. These air quality studies evaluated the projected ground-level pollutant concentrations, the potential effect on the public health and welfare, the effect that the emissions would have on soils and vegetation, and odors. In addition, visibility was analyzed at the National Park Service and U.S. Forest Service designated sensitive areas.

These air quality studies were conducted without the benefit of the proposed emission reductions in the Refinery. Even without taking these reductions into account, the studies indicate that the operation of the proposed Cogeneration Project would comply with all federal and state standards for air quality, and would cause insignificant increases in ambient concentrations of air pollutants. Ambient air concentrations during the facility's operation would be almost indistinguishable from existing air quality levels. In addition, the Refinery's emission reductions would result in the improvement in air quality for some criteria pollutants.

A more complete discussion of the projected emissions and air quality impacts can be found in Part II, section 3.2 and Part III, Appendix E of the Application for Site Certification.

5.2.4 Construction and Operation Noise

Noise associated with construction of the Cogeneration Project is not likely to impact listed species or critical habitat. Construction machinery will generate some noise, but this noise would be temporary and terminate upon the completion of construction. Moreover, noise levels will fluctuate during the construction stage depending upon the construction activities. Construction related noise would be localized to the areas immediately adjacent to the Cogeneration Project.

Impacts from noise generated by the operating Cogeneration Project would not be significantly different than the character of the current background noise levels due to existing operations. Existing background noise is very low and similar to "white noise" produced by a distant cooling fan. Site-specific modeling studies indicate that operational noise will be minimal and below Washington State standards relative to industrial-zoning and residential-zoning criteria. This is especially true as noise levels significantly decrease with distance from the plant.

5.2.5 Wastewater

Wastewater treatment and discharge aspects in the design of the Cogeneration Project were described and discussed in Sections 2.6 Construction and 2.7 Operation.

Three sources of effects from wastewater on surface water are possible. First, the quantity or quality of surface water currently draining from or through the proposed site to Terrell Creek could be altered. However, the proposed Cogeneration Project has been designed to divert surface and stormwater from unaffected areas around the plant in order to prevent alteration of quality or quantity. This surface water would continue to drain into a ditch along Blaine Road leading to Terrell Creek.

Second, stormwater from the Cogeneration project site will be routed through treatment facilities and detention ponds to the wetland mitigation area north of Grandview Road. This treated stormwater will co-mingle with other surface water drainages that may eventually drain into Terrell Creek under high flow conditions. Although the proposed Cogeneration Project will not directly or indirectly affect Terrell Creek, a "Checklist for Documenting Environmental Baseline and Effects of Proposed Action(s)" (NMFS 1996: 13) is included as Table 5. Information for several of the parameters in this table was not collected during the stream survey discussed Section 3.3.2. However, the fact that Terrell Creek is currently used by resident coho salmon indicates that conditions in the stream are likely properly functioning. In addition, sufficient control methods and distance between the proposed project and the stream will result in no effect on the stream. No component of the proposed Cogeneration Project would be built near the stream and no storm or other surface water will be discharged directly to it.

The third source of effects could come from discharge of contaminated stormwater and industrial wastewater from the Cogeneration Project. As discussed in Section 2, stormwater or wastewater, which could carry trace oil or chemicals from secondary containment areas, will be routed to the Refinery and treated with the Refinery's NPDES wastewater stream in the plant's wastewater system treatment facility. Treated water would be discharged through the BP Refinery's NPDES permitted outfall. The Cogeneration wastewater component of the total Refinery's NPDES wastewater stream will be approximately 8 percent. Because the volume of Cogeneration wastewater is small and contains very low levels of contaminants, it would have little to no effect on the quality of water discharged. It will, therefore, have no effect on threatened and endangered species.

5.3 Listed and Candidate Species

5.3.1 Direct Impacts

Direct impacts to listed and candidate species are not anticipated from this project.

Potential direct impacts include:

- Wastewater Discharges: There will be an insignificant increase in wastewater discharged at the BP outfall into the Strait of Georgia. The current NPDES mixing zone is sufficient to protect the marine environment from these increases, which are less than normal variations in current discharges.
- Air Emissions: Air emissions from the proposed project will meet all Federal and State requirements. In addition, as a result of emission reductions at the Refinery there is likely to be a net decrease in total criteria pollutant emissions from the combined operation of the Cogeneration Facility and the Refinery.

- Noise: There will be a perceptible (to the human ear) increase in noise in the immediate vicinity of the project. However, due to the lack of presence of threatened or endangered species or suitable habitat for these species within the "action area" of the project it is anticipated there will be no significant impacts.
- Land Clearing and Loss of Habitat: Approximately 12-acres of wetlands and 21 acres of uplands will be cleared for construction of the project. However, there are no documented threatened or endangered species found within this area and the vegetation to be cleared is not suitable habitat for these species.
- Wetland Impacts: As a result of the project, approximately 35.37 acres of wetlands will be impacted, of which 4.86 acres will be disturbed temporarily and 30.51 acres will be permanently filled. This loss will be offset by the restoration, rehabilitation, and enhancement of approximately 110 acres of wetlands and interspersed upland areas. All of the mitigation area is within the same drainage area as the proposed project.

The primary reasons for no direct impacts is the lack of use of the Cogeneration Project site by listed and candidate species and the design features of the project. All sources of direct effects on listed and candidate species and critical habitats would be avoided through design features of the proposed Cogeneration Project, such as:

- Limiting use of chemicals during water use and wastewater treatment.
- Air pollution control equipment and emission offsets.
- Major equipment, the primary source of the noise impacts will be enclosed.
- Wetland mitigation

5.3.2 Indirect Effects

Indirect effects could include potential impacts from changes in the quantity or quality of surface water draining to Terrell Creek. However, Terrell Creek and the associated salmonid habitat are beyond the point were effects of discharges from the Cogeneration project could be felt. As shown in previous sections, the design of the Cogeneration Project and the methods to control and manage the stormwater and the Refinery's wastewater treatment facility will avoid indirect effects.

- Stormwater will be discharged into detention ponds to regulate flows off the project site and reduce turbidity.
- Stormwater will be discharged from the detention ponds into enhanced, restored and created wetlands and there will be no direct discharges directly into Terrell Creek receiving waters.
- Enhancement, restoration, and creation of wetlands adjacent to the Terrell Creek riparian areas will improve the diversity of wildlife habitat and protect fisheries values in Terrell Creek.

5.3.3 Cumulative Effects

Within the project action area, the Refinery is adjacent to the proposed Cogeneration Project site. In addition, Alcoa Intalco Works (an aluminum smelter), the ConocoPhillips Ferndale Refinery, and a number of other industrial facilities are within a few miles (Section 3.2, Existing Developments). The proposed Cogeneration Project would add additional impervious surfaces to the action area.

Although the Cogeneration Project will result in the filling of some low-value wetlands, BP is preparing a wetland mitigation plan that will result in an overall improvement in wetland function and wildlife habitat for the area. The mitigation wetlands would provide contiguous enhanced habitat with existing wildlife and wetland enhancement areas adjacent to Terrell Creek significantly improving the biodiversity of the Terrell Creek ecosystem. A summary of avoidance of cumulative impacts is provided below:

- Total emissions of criteria pollutants are expected to be offset by reductions in emissions from the Refinery.
- Noise modeling shows insignificant cumulative noise levels over background levels.
- Fresh water withdrawal from the Nooksack River usage is reduced through reuse of industrial once-through cooling water.
- The dedicated wetland mitigation of 100 acres in an area zoned "light industrial" will limit the potential for further industrialization of the area.

5.3.4 Interdependent/Interrelated Activities

Interdependent/interrelated activities include the proposed construction of a transmission line to connect the Cogeneration Project to the Bonneville Power Administration transmission grid. The Corps of Engineers issued a "Nationwide Permit

26" dated December 20, 1999 for the construction of a new transmission line as a separate project to connect the proposed Cogeneration plant to the 230-kV BPA transmission line. The transmission line will be 0.8 mile long when constructed. Construction of the access roads and tower pads will fill a small wetland area and require a small amount of tree removal. A 4.8-acre wetland complex north of Grandview Road was constructed for mitigation for the access roads and tower pads. Additional details of the interrelated project are available from the Washington Department of Ecology, Order number 1998-4-02349.

In addition, the recycling of non-contact once-through cooling water from the Alcoa aluminum smelter to the BP Cogeneration Plant and BP Refinery can be viewed as a positive interdependent/interrelated effect. The recycling will reduce the amount of wastewater discharged from both facilities to the Strait of Georgia. The recycling program will also reduce the amount of fresh water required to be withdrawn by the PUD from the Nooksack River.

A new process unit is being constructed inside the Refinery and is expected to be in operation before the Cogeneration Project begins operations. The new process unit is called an Isomerization (ISOM) Unit and it will enable the Refinery to produce cleaner gasoline, and thus is sometimes referred to as the "Clean Fuels Project." As originally proposed, this unit would have incorporated a gas-fired reboiler to provide heat for a distillation tower. With the possibility of steam being available from the future Cogeneration Project, the decision was made to redesign the ISOM unit to use steam as a heating medium. Until the Cogeneration Project is built and operating, a new utility boiler will provide the steam for ISOM. When the Cogeneration Project begins supplying steam to the Refinery, the new boiler would be shutdown along with the other Refinery utility boilers and would result in a reduction in air emissions. Without this modification, the gas-fired reboiler would have continued to operate.

There are no other interdependent or interrelated activities connected to the proposed construction and operation of the Cogeneration Project.

6. MANAGEMENT ACTIONS RELATED TO THE SPECIES

Effects from the proposed Cogeneration Project will be avoided and minimized through design of the facility. No critical habitat for any listed or candidate species will be directly or indirectly impacted. Thus, specific impact reduction measures or other additional management actions related to listed and candidate species are not necessary.

However, in response to concerns of the Corps of Engineers and the Washington Department of Ecology, the BP Cherry Point Refinery will implement a wetlands mitigation plan. This mitigation will replace the approximately 35 acres of wetlands that will be impacted due to construction of the cogeneration plant with approximately 110 acres of wetlands. These replacement wetlands will be located north of Grandview Road and will receive treated and untreated stormwater from the project as described previously. In addition to preserving and enhancing the functions of wetlands lost on the project site, the enhanced and enlarged wetlands will serve to additionally treat stormwater and further protect Terrell Creek. Details of the wetland mitigation plan are present in Appendix B.

7. RECOMMENDED DETERMINATIONS

As shown in previous discussions of effects, the proposed Cogeneration Project will avoid or minimize all effects to listed and candidate species and critical habitat. Thus, "no effect" determinations are recommended. These recommendations are based on the definition from the Corps of Engineers BE guidelines

> " 'No effect' determinations indicate that listed species will not be affected by the proposed action, typically because their habitat will not be altered or the species is not found in the area at the time of year when the proposed activity will occur, and the project actions would have no long-lasting effects."

7.1 Chinook Salmon: Threatened

A *recommended* determination of **no effect** is made for chinook salmon. Effects on surface water quality and quantity and on marine water quality will be avoided through design features and wetland mitigation. The water quality and quantity of Terrell Creek will not be changed by any action of the proposed project. In addition, chinook salmon do not appear to use Terrell Creek.

Discharges to the marine environment will be controlled by the BP Cherry Point Refinery wastewater treatment system, which is regulated and monitored under the Refinery's NPDES permit. Thus, any effects to the marine habitats will also be avoided.

7.2 Coho Salmon: Candidate

A *recommended* determination of **no jeopardy** is made for coho salmon. If listed, the *recommended* determination would be **no effect** for the same reasons as discussed for chinook salmon, even though coho salmon use Terrell Creek.

7.3 Bull Trout: Threatened

A *recommended* determination of **no effect** is made for bull trout for the same reasons as for chinook and coho salmon. There are no known populations of bull trout that use the project action areas and effects on marine water quality will be avoided through project design features.

7.4 Bald Eagle: Threatened

A *recommended* determination of **no effect** is made for bald eagles. The proposed construction and operation will not affect feeding, resting, or breeding habitat or resources for bald eagles. Because of the substantial distance to the nearest nesting location, temporary effects of noise and additional human presence are insignificant. In addition, eagles apparently do not use the project site or direct effects action area for foraging or roosting.

7.5 Steller Sea Lion: Threatened

A *recommended* determination of **no effect** is made for Steller sea lions. The proposed Cogeneration Project will not affect feeding, resting, or breeding habitat or resources for

Steller sea lions since they have not been shown to occur in the project vicinity or action areas.

7.6 Humpback Whale: Endangered

A *recommended* determination of **no effect** is made for humpback whales. The proposed Cogeneration Project will not affect feeding, resting, or breeding habitat or resources for humpback whales since they have not been shown to occur in the project vicinity or action areas.

7.7 Leatherback Sea Turtle: Endangered

A *recommended* determination of **no effect** is made for leatherback sea turtles. The proposed Cogeneration Project will not affect feeding, resting, or breeding habitat or resources for leatherback sea turtle since they have not been shown to occur in the project vicinity or action areas.

8. ESSENTIAL FISH HABITAT ANALYSIS[2]

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. The MSA requires Federal agencies to consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (MSA §305(b)(2)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct *(e.g.*, contamination or physical disruption), indirect *(e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

The EFH mandate applies to all species managed under a federal Fishery Management Plan (FMP). For the Pacific West Coast (excluding Alaska), there are three FMPs, covering groundfish, coastal pelagic species, and Pacific salmon. Therefore, Federal agencies must consider the impact of a proposed action on EFH for any species managed under those three FMPs. The only FMP that is applicable to the proposed Cogeneration Project is that for Pacific salmon.

EFH for the Pacific coast salmon fishery means those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. To achieve that level of production, EFH includes all those streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California. In the estuarine and marine areas, salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception. Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years).

Essential Fish Habitat (EFH) does not exist within the project action area as described in Section 3.1. However, Terrell Creek is near the project action area and contains EFH for coho salmon. Terrell Creek receives drainage from wetlands to which the Congeneration

[2] Introductory and explanatory material was obtained from the NMFS EFH Internet site at http://www.nwr.noaa.gov/1habcon/habweb/msa.htm and http://www.nwr.noaa.gov/1habcon/habweb/efh_assessment_template.pdf

Project will discharge stormwater. However, no potential is seen for adverse effects on Terrell Creek from the project.

As shown previously by the ESA analysis, the proposed Cogeneration Project would not result in any measurable effects to water or habitat quality. Therefore, the project will have **no effect** on EFH for Pacific salmon.

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TABLES

FIGURES

APPENDIX A

APPENDIX B

APPENDIX C