DOE/EA-1858

FINAL
ENVIRONMENTAL ASSESSMENT

FOR

NIPPON PAPER INDUSTRIES USA COMPANY BIOMASS COGENERATION PROJECT, PORT ANGELES, WASHINGTON

U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Golden Field Office

JUNE 2011

DOE/EA-1858

FINAL
ENVIRONMENTAL ASSESSMENT

FOR THE

NIPPON PAPER INDUSTRIES USA COMPANY BIOMASS COGENERATION PROJECT, PORT ANGELES, WASHINGTON

U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Golden Field Office

JUNE 2011

COVER SHEET

RESPONSIBLE AGENCY: U.S. Department of Energy

TITLE: *Final Environmental Assessment for Nippon Paper Industries USA Company Biomass Cogeneration Project, Port Angeles, Washington* (DOE/EA-1858)

CONTACT: For more information about this Environmental Assessment (EA), please contact

Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy
1000 Independence Avenue, SW, EE-4A
Washington, D.C. 20585
ATTN: Dr. Jane Summerson
Telephone: (202) 340-9629
Fax: (202) 586-8177

ABSTRACT: The U.S. Department of Energy (DOE) has provided Federal funding to the Washington Department of Commerce under the State Energy Program (SEP). Washington selected a Nippon Paper Industries USA Company (Nippon) project for a $600,000 grant and $1.4 million loan under the SEP. Nippon's proposed project is to construct and operate a new biomass-fueled cogeneration facility that would produce both heat and power at its existing paper mill in Port Angeles, Clallam County, Washington. DOE has prepared this Environmental Assessment to help it decide whether to authorize Washington's proposed use of the SEP Federal funding for Nippon's proposal. The new facility would include a new boiler that would replace an existing oil and biomass-fired boiler. The new boiler would be larger, requiring about twice as much biomass fuel as the current boiler, and would produce sufficient steam to supply paper mill demands and to operate a 20-megawatt steam turbine generator. Electricity from the turbine generator would be sold to an electrical utility. The new facility would be constructed on mill property that is currently paved or covered with buildings. Under the proposed project, two existing buildings would be demolished and new construction would include a boiler building, an adjacent turbine generator building, and a building for the storage of biomass fuel. The new boiler would include air pollution control equipment with best available control technology.

This EA analyzes the potential environmental impacts of the proposed construction, operation, and decommissioning of the biomass cogeneration project and the alternative of not implementing this project (the No-Action Alternative), under the assumption that the project would not go forward without the SEP funding. The EA also analyzes, as a subcategory under the No-Action Alternative, a project alternative that would involve replacing the existing biomass boiler with a new, similar-sized, more efficient biomass boiler sized to meet the mill's steam needs, but that would not include cogeneration of electricity.

AVAILABILITY: This EA is available for review on the DOE Golden Field Office Reading Room Website at http://www.eere.energy.gov/golden/Reading_Room.aspx and the DOE NEPA Website at http://nepa.energy.gov/DOE_NEPA_documents.html.

ACRONYMS AND ABBREVIATIONS

ARRA	*American Recovery and Reinvestment Act of 2009*
ARMP	Archaeological Resources Management Plan
BACT	best available control technology
Btu	British thermal unit
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
DAHP	Washington Department of Archaeology and Historic Preservation
dBA	decibel on an A-weighted scale, used to approximate the human ear's response to sound
DNR	Washington Department of Natural Resources
DOE	U.S. Department of Energy (also called the Department)
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
GWP	global warming potential
JARPA	Joint Aquatic Resource Permit Application
MOA	Memorandum of Agreement
NEPA	*National Environmental Policy Act*
NHPA	*National Historic Preservation Act*
NOA	Notice of Availability
NOC	Notice of Construction
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
ORCAA	Olympic Region Clean Air Agency
PM_{10}	particulate matter with an aerodynamic diameter of 10 micrometers or less
$PM_{2.5}$	particulate matter with an aerodynamic diameter of 2.5 micrometers or less
RCW	Revised Code of Washington
SEP	State Energy Program
SEPA	*State Environmental Policy Act*
SHPO	State Historic Preservation Officer
SR	State Route
U.S.C.	United States Code
WAC	Washington Administrative Code

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1. INTRODUCTION

1.1 National Environmental Policy Act

The *National Environmental Policy Act* [42 United States Code (U.S.C.) 4321 *et seq.*; NEPA], the Council on Environmental Quality (CEQ) NEPA regulations [40 *Code of Federal Regulations* (CFR) Parts 1500 to 1508], and the U.S. Department of Energy's (DOE's) NEPA implementing regulations (10 CFR Part 1021) require that DOE prepare a detailed Environmental Impact Statement (EIS) for all "major Federal actions significantly affecting the quality of the human environment" 42 U.S.C. 4332(2)(C) (1994). Federal regulations permit the DOE to conduct a less detailed Environmental Assessment (EA) to determine whether the proposed action will "significantly affect" the environment and thus whether an EIS is required [40 CFR 1501.4(b), 1508.9 (2001)]. NEPA usually applies when, as here, a Federal agency provides Federal financial assistance for an activity or project to be carried out by a State or other non-Federal entity.

This EA provides information that will assist DOE in making an informed decision about allowing financial support for the construction and operation of the proposed biomass cogeneration facility (proposed project or Nippon Biomass Cogeneration Project). The EA evaluates the potential individual, cumulative, direct, and indirect impacts of the proposed project. For purposes of comparison, this EA also evaluates the impacts that could occur if DOE did not provide funding (the No-Action Alternatives), under which DOE assumes the proposed project would not proceed. No other action alternatives are analyzed.

This EA also presents the results of DOE's compliance with other Federal statutory requirements should it decide to allow the requested funding. For example, elements of the Nippon Biomass Cogeneration Project would be located in flood zones or floodplains. Specifically, most of the existing Nippon paper mill, as well as most of the sand spit on which the mill is located, are within a zone subject to coastal flooding. Pursuant to Executive Order 11988, *Floodplain Management*, each Federal agency is required, when conducting activities in a floodplain, to take actions to reduce the risk of flood damage; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. Regulations issued by DOE that implement this Executive Order are contained in 10 CFR Part 1022, "Compliance with Floodplain and Wetland Environmental Review Requirements." These regulations require DOE to prepare a floodplain assessment for any proposed action in the base floodplain, which is a 100-year floodplain (that is, a floodplain with a 1.0 percent chance of flooding in any given year). The regulations also state that whenever possible, DOE shall accommodate requirements of the Executive Order through the applicable NEPA procedures [10 CFR 1022.2(b)]. Accordingly, Section 3.1.2.3 of this EA provides a floodplain assessment.

In addition, this EA is intended to fulfill DOE's obligations under Section 106 of the *National Historic Preservation Act* (NHPA; 16 U.S.C. 470 *et seq.*) and the *Endangered Species Act*, as amended (16 U.S.C. 1531 *et seq.*), and to document DOE's fulfillment of requirements under the *Coastal Zone Management Act of 1972* (16 U.S.C. 1451 *et seq.*). These statutory requirements are addressed in subsequent sections of this document.

This EA considers two environmental review actions that have already taken place. First, the project proposed by Nippon has already been evaluated in accordance with the Washington *State Environmental Policy Act* (SEPA). The City of Port Angeles was the lead agency for issuing the *Nippon Paper Industries USA Co., Ltd. Biomass Cogeneration Facility Project Final SEPA Environmental Impact Statement* (SEPA EIS), September 3, 2010. The environmental review process presented in the SEPA EIS identified the potential for the proposed project to affect cultural resources and, correspondingly, the need for DOE to engage in a consultation process with the affected parties under Section 106 of the NHPA. This EA is being prepared in part because a Memorandum of Agreement (MOA) under Section 106 is required to mitigate potential adverse impacts to cultural resources as described in more detail in Section 3.1.2.2. To avoid duplication to the extent practicable, this EA often summarizes and incorporates by reference information from the SEPA EIS (http://www.cityofpa.us/CommEconDev.htm#nIP).

The second environmental review is a proposal by the National Park Service (NPS) to remove two existing dams on the nearby Elwha River and restore the river's ecosystem and native fisheries (Elwha River Restoration Project). This action, directed by the *Elwha River Ecosystem and Fisheries Restoration Act* (the Elwha Act, Public Law 102-495), was preceded by a series of NEPA documents issued by the NPS, the most recent of which is the *Elwha River Ecosystem Restoration Implementation, Final Supplement to the Final Environmental Impact Statement* (NPS 2005). The Elwha River and the shallow alluvial aquifer that underlies the River near its mouth are the sources of water for the city of Port Angeles and the Nippon paper mill, and the proposed restoration of the river could impact these water sources. This and other issues that could potentially cause cumulative impacts from the NPS' and DOE's proposed actions are addressed in Chapter 4 of this EA.

1.2 Background

Nippon proposes to construct and operate a new biomass-fueled cogeneration (combined heat and power) facility at its existing paper mill in Port Angeles, Clallam County, Washington (Figure 1-1). The new facility would replace an existing oil and biomass-fired boiler within a paper mill that has been in continuous operation since 1920. The current estimated project cost is $71 million. The State of Washington selected this project for a $600,000 grant and a $1.4 million loan from the Washington Department of Commerce, Energy Policy Division based on the project's goal of improving the paper mill's energy efficiency and use of renewable energy.

A Washington Department of Commerce grant and loan to this project would come from money that the State of Washington received from DOE pursuant to DOE's State Energy Program (SEP). The purpose of the SEP is to promote the conservation of energy and reduce dependence on foreign oil by helping States develop comprehensive energy programs and by providing them with technical and financial assistance. SEP is authorized under the *Energy Policy and Conservation Act*, as amended (42 U.S.C. 6321 *et seq*.). States can use SEP funds for a wide variety of activities related to energy efficiency and renewable energy (42 U.S.C. 6321 *et seq*. and 10 CFR Part 420). In the *American Recovery and Reinvestment Act of 2009* (Pub. L.111-5, 123 Stat. 115; ARRA or Recovery Act), Congress appropriated $3.1 billion to DOE's SEP, and the State of Washington received $60.9 million pursuant to a Federal statutory formula for distributing these funds.

Figure 1-1. Region of the Proposed Project and the Location of the Nippon Paper Mill on Ediz Hook

The State of Washington informed DOE that it proposes to use a total of $2 million of its SEP funds for a grant and loan to the Nippon Biomass Cogeneration Project. The potential use of Federal SEP funds to assist in the financing of this project constitutes a Federal action subject to review under NEPA.

In compliance with NEPA regulations, this EA examines the potential environmental impacts of DOE's Proposed Action (providing funding for the proposed project) and the No-Action Alternatives. This EA also describes options that Nippon (sub-recipient) considered during development of its application to the State of Washington, which is the recipient of Federal funding under the DOE's SEP. This Final EA provides DOE with the information needed to make an informed decision about whether allowing the State of Washington to provide some of its Federal funds for the proposed project could result in significant environmental impacts.

1.3 Purpose and Need

1.3.1 DOE'S PURPOSE AND NEED

DOE's purpose and need is to ensure that Federal SEP funds are used for activities that meet congressional statutory aims to improve energy efficiency, reduce dependence on imported oil, decrease energy consumption, create and retain jobs, and promote renewable energy. Providing funding as part of Washington's SEP grant to Nippon would partially satisfy the need of this program to assist U.S. cities, counties, states, territories, and American Indian tribes to develop, promote, implement, and manage energy efficiency and conservation projects and programs designed to:

- Reduce fossil fuel emissions;
- Reduce the total energy use of the eligible entities;
- Improve energy efficiency in the transportation, building, and other appropriate sectors; and
- Create and retain jobs.

Congress enacted ARRA to create jobs and restore economic growth through measures that, among other things, modernize the nation's infrastructure and improve energy efficiency. Provision of SEP funds for the proposed project would partially meet these goals.

1.3.2 STATE OF WASHINGTON'S PURPOSE AND NEED

Washington's purpose and need is to take action in pursuit of the State's energy strategy, which includes reducing dependence on fossil fuel energy sources through improved efficiency and development of cleaner energy sources [Revised Code of Washington (RCW), Title 43, Section 43.21F.088]. Applications were evaluated using criteria including the degree to which applicants could match funds, create or retain jobs, reduce energy consumption, produce renewable energy, and reduce greenhouse gas emissions (Washington 2009).

1.4 Public and Agency Involvement

This section addresses efforts made to inform the public of the Nippon Biomass Cogeneration Project and to make contact with Federal, State, and local agencies that could have involvement with permitting requirements or other concerns associated with the proposed project. Subsection 1.4.1 addresses efforts already taken by the City of Port Angeles (in accordance with State of Washington requirements) and Nippon; Subsection 1.4.2 addresses efforts implemented, or being implemented by DOE. Appendix A is the distribution list of the persons who received the Notice of Availability (NOA).

1.4.1 CITY OF PORT ANGELES AND NIPPON PAPER INDUSTRIES PUBLIC INVOLVEMENT

Local and State agencies, as well as interested members of the public, have had significant opportunity for involvement in the proposed project from the SEPA and permitting actions that have already occurred. Under the Washington SEPA Rules [Washington Administrative Code (WAC) Chapter 197-11], the lead agency provides public notice when it makes a Determination of Significance and when it issues a draft EIS. The Determination of Significance indicates the proposed action may have a probable significant adverse environmental impact and that an EIS is required. Accordingly, the notice of a Determination of Significance typically requests comments on the scope of the action and sets a date to close the comment period. The State SEPA Rules require lead agencies to use "reasonable methods to inform the public and other agencies" whenever public notices are required and provides examples of such reasonable methods; however, the Rules allow the lead agency to use its own existing notice procedures. In the case of the City of Port Angeles, applicable notice procedures are set in the City's Municipal Code, Title 15 Environment, and require that public notices, such as those required for a Determination of Significance and draft EIS, include (1) "posting the property, for site-specific proposals" and (2) "publishing notice in a newspaper of general circulation in the County, City, or general area where the proposal is located."

The Joint Aquatic Resource Permit Application (JARPA) is a combined permitting process for multiple local, State, and Federal permits, and, depending on which permits are applicable, includes additional opportunity for public involvement. For example, the Shoreline Substantial Development Permit, which is part of the JARPA process and a requirement for the proposed project, is issued by local government and requires the local government to publish a public notice. A public hearing is also applicable if deemed necessary by the local government.

A timeline of the SEPA and JARPA activities associated with the proposed project and the public notifications that were involved in these activities is summarized below.

- March 11, 2010 – Nippon filed the combined SEPA and JARPA application with the City of Port Angeles.

- March 16, 2010 – The City of Port Angeles issued a Determination of Significance and Request for Comments on Scope of the EIS for the proposed project. A closing date of April 9, 2010 was established for the receipt of scoping comments. Substantive scoping

comments received by the City during the comment period are included in the final SEPA EIS.

- March 18, 2010 – The City of Port Angeles mailed a public notice to 99 surrounding property owners within and exceeding 300 feet from the location of the proposed project.

- March 19, 2010 – The City of Port Angeles published a public notice in the *Peninsula Daily News* of the receipt of a complete Shoreline Substantial Development Permit application.

- July 6, 2010 – The City of Port Angeles issued the Draft EIS for public and agency comment, with a closing date of August 5, 2010 for comments. Substantive comments received by the City during the comment period and responses are included in the final SEPA EIS.

- August 12, 2010 – The City of Port Angeles posted the location of the proposed project for a land use action.

- August 13, 2010 – The City of Port Angeles mailed a notice to property owners within 300 feet of the project site.

- August 15, 2010 – The City of Port Angeles published a notice of the Shoreline Substantial Development Permit application in the *Peninsula Daily News* and comments were solicited through September 6, 2010.

- September 3, 2010 – The City of Port Angeles issued the Final SEPA EIS.

- September 22, 2010 – After issuing notice in conformance with City Code, the Port Angeles Planning Commission held an open record hearing on the Shoreline Substantial Development Permit application for the proposed project. Approximately 60 people attended the meeting, and, after hearing comments, the Planning Commission approved the Conditional Use and Shoreline Substantial Development Permits (Peninsula Daily News 2010a).

- October 6, 2010 – A coalition of seven environmental groups filed an appeal with the City of Port Angeles against Nippon's proposed project. The appeal challenged the validity of the SEPA EIS and contended that the Shoreline Substantial Development Permit should have listed Nippon's proposal as new use as an electric utility (Peninsula Daily News 2010b).

- December 6, 2010 – In a meeting of the Port Angeles City Council, the Council upheld the earlier Planning Commission decision to approve permits for the Nippon project. The Council's findings included that the steam turbine would be considered an accessory to the mill and not a utility (Peninsula Daily News 2010c).

- January 14, 2011 – Six of the seven environmental groups that appealed the Port Angeles permits took their appeal to the State Shoreline Hearings Board. The environmental

groups in opposition to the Nippon project also indicated their intent to file an appeal in the spring with the State Pollution Control Hearings Board on the adequacy of the SEPA EIS (Peninsula Daily News 2011).

- April 26, 2011 – The State Shoreline Hearings Board issued an Order Granting Summary Judgment (SHB No. 11-004) in favor of the City of Port Angeles and Nippon. In the Order, the Board concluded that the cogeneration facility was an accessory use to the Nippon mill's primary use for paper production, properly allowed under a shoreline substantial development permit. The order further dismissed the appeal in this case (SHB 2011).

As noted above, written comments on the scope of the SEPA EIS and on the Draft SEPA EIS, itself, were included in appendixes to the final SEPA EIS. As an indication of public, agency, and organization involvement, Table 1-1 lists the sources of written comments the City received for both actions.

Table 1-1. Sources of Written Comments on EIS Scoping and on the Draft SEPA EIS

Source of Written Comments	Written Comments On	
	EIS Scoping	Draft EIS
Lower Elwha Klallam Tribe	yes	yes
Jamestown S'Klallam Tribe	yes	
State of Washington Department of Archaeology and Historic Preservation	yes	
State of Washington Department of Ecology, Southwest Regional Office	yes	yes
Olympic Region Clean Air Agency (ORCAA)	yes	yes
Olympic Environmental Council	yes	yes
Center for Environmental Law and Policy		yes
No Biomass Burn		yes
PT AirWatchers		yes
Sierra Club, North Olympic Conservation Committee		yes
Members (number) of the public with no identified affiliation	yes (1)	yes (5)

Source: Port Angeles 2010a.

Nippon also conducted more than 15 informative presentations to various community groups upon request (Smith 2011a). Presentations have been given to the City of Port Angeles, Chamber of Commerce, Clallam Public Utilities District Board, Clallam County Economic Development Commission, Port Angeles Business Association, various banks, Soroptomist Club, Kiwanis Club, Port Angeles Realtor Association, Todd Ortloff Show (radio station KONP), and Lower Elwha Klallam Tribe.

1.4.2 DOE ACTIONS

DOE's involvement in the Nippon Biomass Cogeneration Project began after the State of Washington's decision to select the project for SEP funding. DOE initiated formal consultations with the State of Washington's Department of Archaeology and Historic Preservation (DAHP) and with potentially interested American Indian tribes because the existing mill site was home for many years to American Indians and DOE understands that this project has a potential to adversely affect historic properties of traditional religious or cultural importance. DOE initiated consultation to comply with the requirements of Section 106 of the NHPA. Appendix B of this EA contains copies of the consultation letters that DOE sent to the State Historic Preservation

Officer (SHPO) and to applicable tribal governments. These letters and associated DOE actions are further addressed below. DOE also sent a letter (Appendix B) to the City of Port Angeles Department of Community and Economic Development to invite its participation in the consultations. This agency was the City's lead for the SEPA EIS.

1.4.2.1 State Historic Preservation Officer

DOE met with Washington DAHP's SHPO and the State Archaeologist, as well as the SEP representative from the State Department of Commerce, on December 8, 2010, to discuss the proposed project. The primary topic of discussion was the Monitoring and Discovery Plan that Nippon has developed in conjunction with the Shoreline Substantial Development Permit. If the project goes forward, the intent of the Monitoring and Discovery Plan would have been to control how construction actions under the proposed project would occur to ensure proper precautions were taken to identify and protect archaeological artifacts and human remains during excavation activities. At the meeting, State representatives agreed with DOE's intent to develop an MOA to formalize the terms and conditions contained in the Monitoring and Discovery Plan (which became the Archaeological Resources Management Plan discussed below) in order to directly involve tribes in decisions related to actions that might impact tribal interests.

On January 5, 2011, DOE sent a letter to the Washington SHPO at DAHP to formally initiate consultation under Section 106 of the NHPA. The letter described the existing buildings that would be removed from the paper mill site and the new facilities that would be constructed at the site. The letter included a map of where the work would be performed. The letter also recognized the potential for the proposed project to affect historic properties of traditional religious or cultural importance, identified the tribes with which DOE would be initiating Section 106 consultations, and identified DOE's expectation that an MOA would be needed under Section 106 to govern excavation activities at the project site. The letter also requested any comments or concerns with regard to the potential for the proposed project to affect important properties.

DOE received a response letter dated January 11, 2011, from DAHP on behalf of the SHPO and in compliance with Section 106 requirements. In its response, the State concurred with the following: (1) the definition of the area of potential effect, (2) that the two buildings proposed for demolition are not eligible for listing in the National Register, and (3) an MOA is needed to address concerns identified with regard to American Indian archaeology and culture on Ediz Hook. The State's agreement with the need for an MOA also represented concurrence with DOE's finding of adverse effect with regard to the analysis of potential impacts to archaeological and cultural resources.

On May 9, 2011, representatives from DOE, DAHP, the Lower Elwha Klallam Tribe, and Nippon met in Port Angeles (or called in by phone, if unavailable to travel) to discuss the MOA and its associated Archaeological Resources Management Plan (ARMP). This meeting represented the culmination of discussions about proposed archaeological monitoring and mitigation that have taken place since the initial meeting in January and since release of the Draft EA in March. By the meeting's conclusion, the representatives agreed that, based on the progress made to date and assuming resolution of final issues, the signatories, namely, DOE, SHPO, the Lower Elwha Klallam Tribe, and Nippon, likely would sign the MOA by the end of

May. The MOA, described further in Section 3.1.2.2 of this EA, addresses the archaeological and cultural resources that could be affected by the proposed project.

1.4.2.2 Tribal Governments

DOE met with the Tribal Chairwoman, three members of the Tribal Council, the Tribal Environmental Coordinator, and the Tribal Archaeologist of the Lower Elwha Klallam Tribe on December 7, 2010 in Port Angeles, Washington. DOE's purpose for the meeting was to learn about the Tribe's concerns with regard to the proposed project and to answer the Tribe's questions about the proposed project. The Tribal representatives expressed their belief that archaeological materials and perhaps remains of their ancestors are under the proposed project area. They also indicated their concerns about increased water use by the facility as well as pollutants that might be released into the water or the air from the facility.

On January 5, 2011, DOE sent letters to potentially interested tribes to formally initiate Section 106 consultation. Similar to the letter to the SHPO, these letters recognized the potential for the proposed project to affect historic properties of traditional religious or cultural importance, identified DOE's expectation that an MOA will be prepared to govern excavation activities at the project site, and requested any comments or concerns with regard to the potential for the proposed project to affect important properties. Letters were sent to the following seven Federally recognized tribes:

- Hoh Tribe
- Jamestown S'Klallam Tribe
- Lower Elwha Klallam Tribe
- Makah Tribe
- Port Gamble S'Klallam Tribe
- Quileute Tribe; and
- Confederated Tribes and Bands of the Yakama Nation.

DOE received a response letter dated February 14, 2011, from the Makah Tribal Historic Preservation Officer. The letter indicated the Tribe's wish to defer comment on the proposed project to the Lower Elwha Klallam Tribe and/or the Jamestown S'Klallam Tribe.

With letters dated March 18, 2011, DOE mailed copies of the Draft EA to each of the tribes identified above. The Tribal Archaeologist of the Lower Elwha Klallam Tribe provided a response letter dated March 30, 2011, which acknowledged receipt and review of the Draft EA. The Tribal Archaeologist's letter also provided cultural resources information with regard to the Nippon mill site, recognized the importance of the MOA, and recommended that the Lower Elwha Klallam's monitoring and inadvertent discovery plan be incorporated into the MOA. Section 3.1.2.2 of this EA details the additional cultural resources information that the Tribal Archaeologist provided in this letter.

Since the Draft EA, the Lower Elwha Klallam Tribe has been actively involved in development of the MOA and ARMP and is a signatory to the final MOA. None of the other tribes contacted by DOE chose to participate in the consultation process leading to this MOA. Section 3.1.2.2 of this EA also provides additional information on the MOA.

1.4.3 DRAFT ENVIRONMENTAL ASSESSMENT

The Draft EA was published on March 18, 2011, and was originally open for public comment for 15 days. An NOA and public comment procedures for the Draft EA were prepared and sent to Federal, State, tribal, and local agencies, as well as members of the general public. The NOA for the Draft EA stated that the public would have an opportunity to comment on the project's potential environmental impacts and impacts to historic resources in compliance with the NEPA and NHPA processes. The NOA was published in the *Peninsula Daily News*.

DOE posted the Draft EA and the NOA on its NEPA Website (http://nepa.energy.gov) and the Golden Field Office Public Reading Room Website (http://www.eere.energy.gov/golden/Reading_Room.aspx). The public was invited to comment via email or written correspondence mailed to the postal or email address provided in the Cover Sheet. As a result of several requests, DOE extended the public comment period to April 18, 2011. To communicate the extension, DOE posted a notice on the same DOE websites used for posting of the Draft EA and mailed a postcard to interested parties. Comments received on the Draft EA are discussed in Section 1.5.

1.5 Draft EA Comments and Responses

DOE received 2 formal requests for extensions, 12 comment documents, 1 expression of interest, and 1 request for additional information during the 30-day public comment period. Comment documents included one from a State agency, two from an American Indian tribe, three from members of the public, and six from individuals representing interest groups. One comment letter received from the American Indian tribe is considered part of a formal consultation process and, as a result, is also described in Section 1.4.2.2. This section addresses comments in two groups: those comments that resulted in revisions to the EA and those that did not generate specific changes to the EA, but that warranted discussion.

1.5.1 COMMENTS RESULTING IN REVISIONS TO THE EA

Comments that resulted in changes to the EA are summarized below by general topic along with short descriptions of the changes and where in the document those changes were made.

Project Alternatives

Comment Summary – Numerous comments questioned the selection of this project, stating it did not meet DOE, SEP, or State goals and objectives; asked why the funding could not go to more deserving alternative projects, ones that were truly green energy projects; and asked why DOE did not consider other alternatives as required by NEPA.

Response/Revisions – DOE addressed these comments by adding text to Section 2.3.2 and evaluating a specific project alternative that was identified in one of the comments. This alternative involves replacing Boiler 8 with a new, similar-sized, more efficient boiler to produce steam for the mill but not generate electricity. DOE included the discussion of this alternative as a subcategory of the No-Action Alternative because if DOE did not authorize Federal funding for the proposed project, Nippon would be free to implement any number of alternative projects, including replacement of the current boiler with a similar-sized, more efficient boiler, using non-

Federal funding. A qualitative evaluation of the potential impacts associated with the project alternative has been added to Chapter 3. Because this qualitative discussion is often presented in terms of comparisons to the proposed project, the format of Chapter 3 has been modified so that the No-Action Alternative discussion (including evaluation of the subcategory of the project alternative) is presented after the discussion on the proposed project.

Geology and Soils

Comment Summary – One commenter expressed concern over the potential for tsunami and soil/sediment liquefaction issues at the site of the proposed project.

Response/Revisions – DOE added text to Section 3.1.1.2 of the EA to identify the potential for tsunami and liquefaction associated with earthquakes at the project site.

Air Quality

Comment Summary – DOE received several comments related to air quality; those that warranted text changes involved air regulations, fossil fuel use, and carbon neutrality. Specifically, several commenters believe the proposed project would not meet new air regulations and the new boiler would not involve reduced emissions if compared to lowest baseline Boiler 8 emissions rather than the highest. Others disagreed with the amount of fossil fuel DOE specified would be used to produce 20 megawatts of electricity elsewhere, as well as the premise of carbon neutrality and the accounting method DOE used in the Draft EA to estimate the emission of greenhouse gases. Other comments requested clarification about the air emission estimates from the increased number of delivery trucks and to double-check the completeness of Tables 3-1 and 3-2 (in Section 3), which appeared to have missing entries.

Response/Revisions – In response to these comments, DOE made extensive changes to Section 3.1.2.1. With regard to air regulations, text was revised to address the latest information from the ORCAA on the air permitting process for the proposed project, including the fact that the new standards under 40 CFR Part 63 would be made part of the permit requirements; that is, Nippon would have to meet the latest applicable standards in order to operate. Tables 3-1 and 3-2 were reformatted to better define the data presented and to include low values of past Boiler 8 emissions as well as the high values shown in the Draft EA. However, as described in the text, comparisons of emissions from the proposed project are still made to the Boiler 8 high values because the air emission estimates for the proposed project were developed as maximum values, so past high values represent the most appropriate comparisons as well as being the approach required for permitting evaluations. Text was revised to modify the manner in which greenhouse gases are discussed and calculated, including the amount of fossil fuel that would be used to produce 20 megawatts of electricity elsewhere. Revised text recognizes the debate with regard to the carbon neutrality premise and provides new estimates of greenhouse gases without use of that premise. Minor text changes were made to clarify points where there was apparent confusion.

Cultural Resources

Comment Summary – One commenter described archaeological findings associated with Nippon mill site investigations and construction activities occurring in 1991 and 1992.

Response/Revisions – DOE added text to Section 3.1.2.2 of the EA to describe the findings.

Water Resources – Surface Water

Comment Summary – Several comments suggested that the EA did not adequately evaluate the effects of the proposed project's added water demand on Elwha River fisheries habitat during low flow. These same comments generally identified the need to implement water conservation measures for this reason. In regard to the added water demand, one comment stated the EA needed to address the impact to the marine environment from the discharge of additional warm water that would be produced from cooling the steam turbine.

Response/Revisions – DOE added new text to Section 3.1.2.3 to better characterize low flows in the Elwha River, to describe existing plans to deal with that issue, and to discuss how the plans relate to the dam removal activities. New text was also added to the same section to address how the proposed project might affect or be affected by the plans for dealing with low flows. New, related text was added to the Section 4.1 discussion of impacts of the proposed project that would be cumulative with those of the ongoing Elwha River Restoration (dam removal) project.

Section 3.1.2.3 was also modified to clarify the expected effects on the marine environment as a result of the added cooling water that would be discharged under the proposed project.

Hazardous Materials and Waste – Waste Management

Comment Summary – One commenter asked for more detail about how Nippon would ensure proper management of waste during construction and operations and, if Nippon sold the mill to another company, how the guarantee of proper waste management would be transferred.

Response/Revisions – DOE added text to Section 3.1.2.11 to clarify that Nippon is fully subject to the existing framework of rules and regulations, both at Federal and State levels, that define appropriate waste management activities. Also, there is no guarantee that Nippon or any future mill operator (were there to be a transfer) would manage waste properly, but there can be significant penalties levied by regulatory agencies if Nippon or a successor does not.

1.5.2 COMMENTS NOT GENERATING EA CHANGES BUT WARRANTING DISCUSSION

Comments warranting a response but which did not otherwise result in changes to the EA are summarized and addressed below by general topic.

Project Description/NEPA Process

Comment Summary – Several comments reflected on the general process DOE used to meet NEPA requirements. These included questioning why the EA would evaluate decommissioning of the proposed project elements but assume the rest of the mill would remain operational and how people can review the project when its description and building layout keep changing (comparing information in the EA with that in the SEPA EIS).

Response – It is standard for DOE NEPA documents to evaluate potential impacts from the entire life cycle of a project (for example, construction, operations, and decommissioning). In this case, DOE's involvement in the Nippon paper mill is limited to the new boiler and turbine facilities. Future decommissioning of these project elements could be associated with their replacement, changing to a new technology for production of steam, or even changes in the mill

processes. DOE believes it would be overly speculative to link eventual decommissioning of the project elements with shutdown of the entire mill.

With respect to the project elements changing between the SEPA EIS and this EA, NEPA evaluations are intended to be performed early in the planning process of new projects so that the Federal agency can make appropriate decisions on whether to proceed as stated or whether project modifications are needed to minimize environmental impacts. By necessity, project planning must be mature enough to allow or support environment evaluations, but not so mature that "more-than-necessary" planning and design efforts are wasted if project directions are changed. As a bottom line, it is expected that a project will evolve to some extent during and after NEPA reviews are completed as the project moves into more detailed planning and design. Building layouts would certainly be an example of such changes. Following the initial NEPA review process, DOE must stay sufficiently involved in projects receiving Federal funding such that the agency will be aware of project changes that could be outside of its NEPA evaluation. If there are significant changes, the NEPA reviews may have to be repeated or supplemented.

Intentional Destructive Acts

Comment Summary – A commenter disagreed with DOE's conclusion that hazardous substances and supplemental fuels would not offer any particularly attractive targets for terrorists or saboteurs.

Response – Compared to other facilities in the county or even in the region of western Washington, DOE believes the mill, with or without the proposed project, would not represent an attractive target. This is not to say that a terrorist or saboteur act could not cause real damage, but rather that such an act at other locations could cause more damage or, as important or even more important, could have a more symbolically significant impact.

Air Quality – Emission Estimates

Comment Summary – Several commenters questioned the accuracy of Nippon's air emission estimates and described alleged issues with past estimates as the basis for their contention.

Response – In response to these comments, Nippon has indicated that the emissions were as reported and accepted by ORCAA and followed standard calculation and reporting procedures. From DOE's perspective, any past issues that may have been of concern to the commenters are not relevant to the current action. The air permit process that Nippon is undergoing with ORCAA is the ultimate measure of the accuracy of the air emission estimates and, as described in Section 3.1.2.1 of this EA, ORCAA has announced its recommendation that the permit be approved, pending public review and comment on the recommendation.

Air Quality – Impact of Very Fine Particulates

Comment Summary – With regard to air emissions from the mill, several comments expressed a concern about very fine particles that are not regulated and may be damaging to health. As support for this concern, commenters often identified the reference "Health Effects and Economic Impacts of Fine Particle Pollution in Washington," Washington State Department of Ecology Air Quality Program publication number 09-02-021 (Ecology 2009).

Response – As identified in the comment, the cited reference describes health hazards associated with fine particle air pollution, but the reference specifically identifies the fine particulate of concern as "particles smaller than 2.5 microns in size;" that is, $PM_{2.5}$. The reference reports on a study done to quantify the health and monetary impacts of fine particulate pollution in Washington so that the consequences to citizens and communities in Washington might be better understood (Ecology 2009). As described in Section 3.1.2.1 of the EA, $PM_{2.5}$ is a regulated air pollutant, and the Nippon boiler would have emission limits in its permit to ensure that ambient air quality standards were maintained for this parameter. The ORCAA Staff Recommendation (ORCAA 2011e) described in Section 3.1.2.1 includes two limits applicable to $PM_{2.5}$, both are in terms of the amount of fuel (in Btu) going into the boiler. The proposed limits, which are based on best available control technology (BACT), are 0.020 pound per million Btu for combined filterable and condensable particulate and 0.0011 pound per million Btu (30-day rolling average) for filterable particulate only. The combined filterable and condensable value was used in the ambient air modeling described in Section 3.1.2.1 and the results (Table 3-2) predict the ambient level of $PM_{2.5}$ with the proposed project in place would be only a small fraction of the applicable ambient air quality standard.

Air Quality – Greenhouse Gases (GHG) and Impacts on Climate Change

Comment Summary – With regard to the EA's discussion of cumulative impacts, one comment noted that DOE does not evaluate the project's cumulative impact on climate change as required by NEPA.

Response – In February 2010, the CEQ issued "Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions" to heads of Federal departments and agencies (CEQ 2010a). In its discussion of when and how to evaluate GHG emissions, CEQ indicates that when projects involve emissions above some level of note (25,000 metric tons per year is the value proposed in the draft guidance), estimates of such emissions should be quantified and presented in NEPA documentation for consideration by decision makers and the public. The document then goes on to state, "However, it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand. The estimated level of GHG emissions can serve as a reasonable proxy for assessing potential climate change impacts, and provide decision makers and the public with useful information for a reasoned choice among alternatives."

Surface Water Resources – New Federal Emergency Management Agency (FEMA) Maps

Comment Summary – One commenter stated that FEMA will be issuing new flood maps for the project site in 2012 and Nippon's mitigation measures should be based on criteria from the new maps.

Response – As described in Section 3.1.2.3 of the EA, much of the Nippon mill and the proposed project site are within flood prone areas based on a 1990 FEMA Flood Insurance Rate Map. If new flood maps are issued in 2012, they could change specific boundaries to the 100-year flood zones along with estimates of flood elevations within those zones. However, it is unlikely that such changes would be of sufficient magnitude to alter the basic finding from the EA that the

proposed project site is within an area prone to flooding. Until new flood maps are available, the 1990 version is the FEMA map of record.

Biological Resources – Availability of Forest Biomass

Comment Summary – Several comments expressed concern over whether there are sufficient forest residues to support the proposed project and other users, and also alleged that over-collecting would be harmful to the forests and plant and animal habitat and eventually lead to trees being cut for fuel.

Response – Section 3.1.2.4 of the EA addresses this concern; however, because there were several comments related to this topic, DOE felt a point of emphasis would be appropriate. The Washington Department of Natural Resources (DNR) manages State Forest Lands and is actively engaged in dealing with each of the issues identified in the comment summary. As noted in Section 3.1.2.4, DNR is currently undertaking a statewide study to assess forest biomass availability and sustainability, which will include an evaluation of the types and amount of forest residues that need to remain in place to protect the ecosystem. In addition, DNR has undertaken rulemaking actions that would make a Forest Practice Permit a requirement for the collection of forest biomass, which would control actions such as commercial cutting of trees for fuel. By selecting the Nippon project to be a pilot project under its Forest Biomass Initiative, DNR is clearly stating its position that there is sufficient forest biomass to meet the project's need. DOE understands the concerns the commenters have expressed and considers the DNR as the appropriate entity to deal with such concerns in its ongoing management strategies for the State Forest Lands.

Transportation – Wear and Damage to City Roads

Comment Summary – A few commenters stated that the EA should address wear and damage to pavements of the City's roads from the increased truck traffic.

Response – The license and permits required for commercial transporters in the State of Washington contribute to the State's road maintenance funds. Therefore, any impacts related to roads would be resolved outside the scope of the EA.

Socioeconomics – Verification that the Proposed Project Would Retain Jobs

Comment Summary – Several commenters stated the EA needs to provide documentation to verify that the proposed project will retain jobs at the mill. A concern was also expressed that there would be nothing to prevent Nippon from shutting down the mill and continuing to operate the power plant.

Response – Nippon's application for SEP funding characterized the proposed project as one that would improve the mill's viability and ability to retain jobs. DOE has no reason to dispute that claim; any action taken by a business to expand or diversify its operations is logically a means to improve its business base and viability. If the Nippon project receives the proposed Federal funds, DOE and the State Department of Commerce involvement would ensure that the funds were used for the identified purpose; however, such Federal and State agency involvement would not extend further nor would it affect how Nippon managed the mill in the future.

2. PROPOSED ACTION AND ALTERNATIVES

This chapter describes DOE's Proposed Action (Section 2.1), the proposed project (Section 2.2), DOE alternatives (including No Action), and alternatives considered by Nippon (Section 2.3).

2.1 DOE's Proposed Action

DOE is proposing to authorize the State of Washington to use its SEP funds for a grant and loan to assist in financing the design, permitting, and construction of the Nippon Biomass Cogeneration Project to facilitate Washington's achievement of the objectives of the SEP. DOE's funding, through the SEP, would be from the ARRA.

BIOMASS FUEL

Material referenced in this document is forest biomass, generally consisting of byproduct from forest management or forest health treatment activities and does not include lumber products, wood treated with preservatives, or municipal solid waste. Typically, forest biomass includes residual branches, needles, and tree tops ("slash") from logging operations; saplings from thinning actions; tree stems and tops from forest health treatment; and unused materials from lumber mills (DNR 2010a). It may also be referred to as hogged or hog fuel as a result of going through a hog chipper or disintegrator to produce a more easily handled, uniform-sized material.

Other fuel that would be used in the new boiler consists of sludge from the mill's wastewater treatment plant and ultra-low-sulfur diesel fuel as a secondary fuel; the diesel would be used only during boiler start-ups or wood fuel delivery malfunctions.

2.2 Proposed Project

The Washington Department of Commerce selected the Nippon Biomass Cogeneration Project for a $600,000 grant and $1.4 million loan based on the project's goal of improving the Nippon paper mill's energy efficiency and use of renewable energy. The proposed project would be built within the existing 65.3-acre Nippon mill site in Port Angeles, Clallam County, Washington. As shown in Figure 2-1, the mill is located at the base of Ediz Hook on the Strait of Juan de Fuca. As stated in Section 1.1 of this EA, much of the project description that follows is taken from the SEPA EIS (Port Angeles 2010a).

The Nippon paper mill currently uses process steam generated from four different boilers: one large biomass boiler (designated Boiler 8), two smaller oil-fired boilers, and a quick-start electric boiler. The two smaller oil-fired boilers and the electric boiler are used sparingly, primarily as backups to Boiler 8. Under the proposed project, a new biomass boiler with improved air pollution control equipment would be added to the system to take the place of Boiler 8 as the primary source of process steam for the paper mill. The new boiler, however, would be designed to produce high-pressure steam (at 900 pounds per square inch, gauge pressure, compared with the 225 pounds per square inch, gauge pressure, steam currently produced from Boiler 8) that would be directed to a new 20-megawatt steam turbine generator. Steam for mill processes

Source: Port Angeles 2010a

Figure 2-1. The Nippon Paper Industries Mill Site in Port Angeles, Washington

would then be extracted, as needed, from the turbine as depicted by the simplified line drawing (Figure 2-2). The new boiler would also have a higher-rated steam generating capacity, at 225,000 pounds per hour, than Boiler 8, which has a rated capacity of 150,000 pounds per hour. Electric power from the turbine would be sold to a utility. The power would be transmitted through the mill's existing transmission lines, which connect to the Bonneville Power Administration's Port Angeles substation.

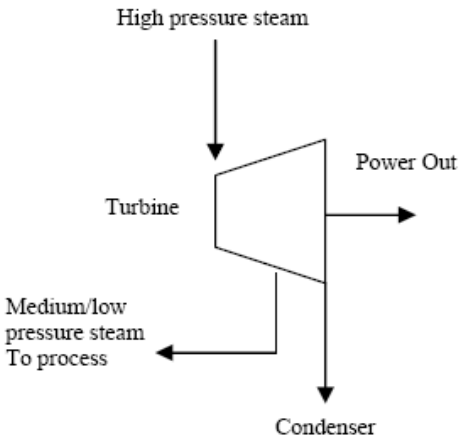


Figure 2-2. Line Drawing of Extraction Steam Turbine (Source: EPA 2008).

Nippon would retain the ability to operate Boiler 8 for up to 15 days per year once the new system was operational. Boiler 8 would be maintained in an operational condition so that it could still be fired with oil or biomass and provide a backup for times when the new system would be out of service, such as for routine maintenance. In such instances, Boiler 8 would be fired with ultra-low-sulfur diesel or biomass in compliance with its air permit requirements (see Section 3.1.2.1). Use of the two smaller oil-fired boilers

and the quick-start electric boiler would not change under the proposed project. In the case of the two smaller oil-fired boilers, the existing limits on their air emissions would not change; the electric boiler does not involve air emissions.

The portion of the paper mill where the new facilities would be constructed is roughly 1 acre in size and is currently paved or occupied by existing structures. Under the proposed project, a portion of the pavement would be removed and several existing facilities would be demolished, including a ratchet ladder (biomass fuel delivery) building and the main office building. The proposed project would include the following new structures:

- New boiler building – about 5,100 square feet and 110 feet tall
- Turbine generator building – about 6,800 square feet and 60 feet tall
- Electrostatic precipitator and scrubber (air pollution control equipment) – about 3,700 square feet and 70 feet tall, with an associated 125-foot-tall stack
- Water treatment building (next to the electrostatic precipitator) – about 500 square feet
- Biomass fuel storage building consisting of either
  - A rectangular building of about 14,000 square feet and 60 feet tall, or
  - A silo about 97 feet in diameter (7,300 square feet) at its base and 115 feet tall, with associated conveyor and entry housing
- Ash silo of about 400 square feet and 35 feet tall
- Condensing cooling water equipment (cooling tower) – maximum of four towers placed on existing chemical tank foundations
- Truck dumper foundation – about 2,100 square feet
- Biomass screening/conveyor support – about 400 square foot foundation

The tentative layout for the new facilities is shown in Figure 2-3. This layout represents the most recent information from the evolving design process and is slightly different than that shown in the SEPA EIS. The changes include a new location for the cooling towers, a small water treatment building, and three chemical tanks adjacent to the boiler building. These chemical tanks would contain aqueous ammonia, caustic, and a polymer solution, and each would have appropriate secondary containment (Smith 2011c). (The polymer tank is an existing tank that would be moved to the location shown in Figure 2-3 due to the construction.) Further, the biomass fuels storage facility is now shown as a round building rather than rectangular to reflect the current design direction of a silo configuration for this facility. Approximately 6 to 8 new utility poles (not shown in the figure) would also be placed to re-route electric transmission lines on the site. All of these poles would be placed within the general project area and on the mill site.

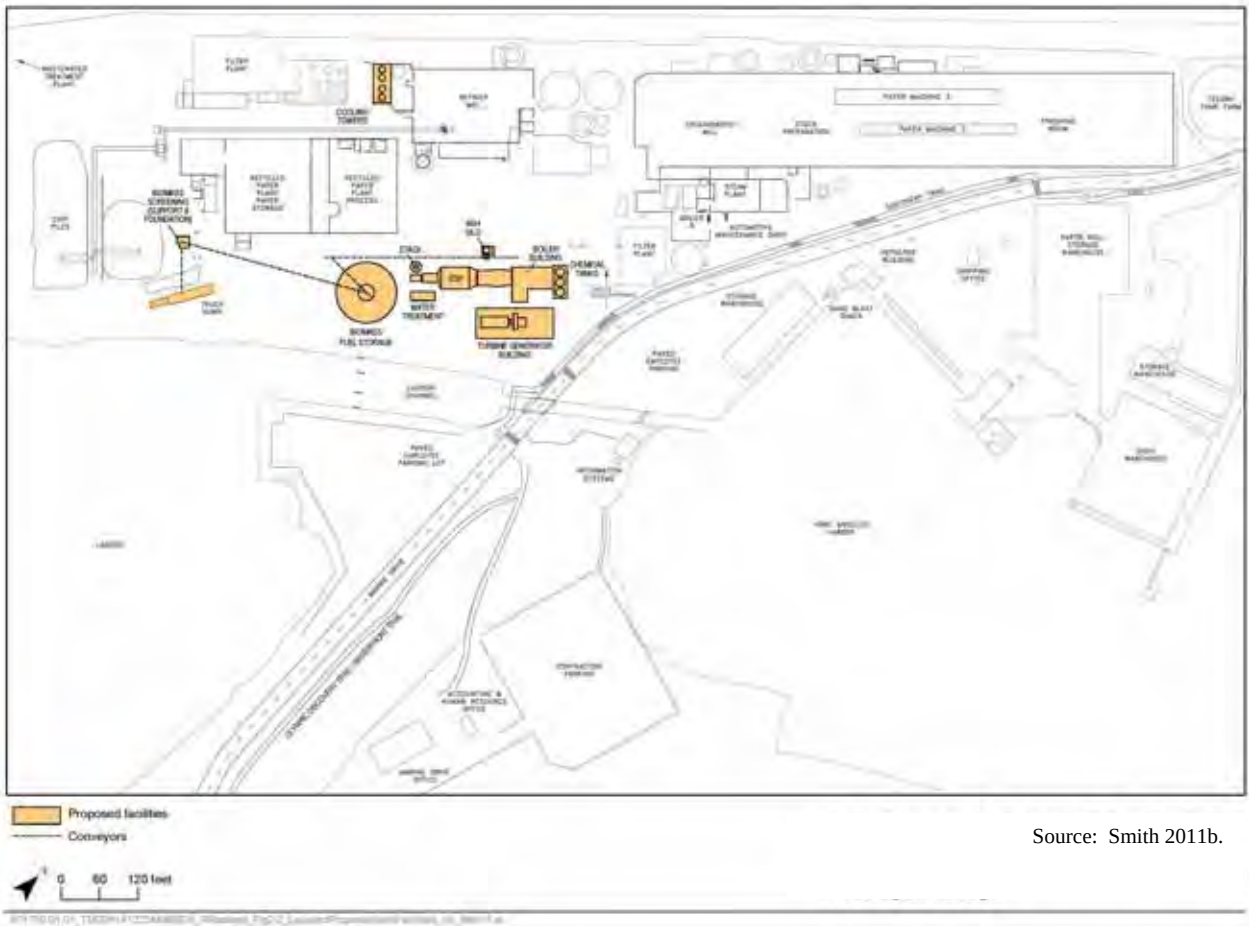


Figure 2-3. Layout of Proposed New Facilities Within the Existing Nippon Mill Site

2.2.1 CONSTRUCTION

The proposed project's construction would take 14 to 18 months and during most of that time, the construction workforce would be about 40 people, but could be as high as 90 people during a 2-month peak period. Standard construction methods and equipment (for example, trucks, excavators, and cranes) would be used, but pile-driving or auger equipment would be used to reach the roughly 70-foot depths expected for the foundation footings of the new buildings. In the locations where the new buildings would be constructed, existing fill would be removed to a depth of about 8 feet and new soils would be brought in as necessary to provide the soil characteristics and compaction criteria established in the project design.

Staging areas for construction materials and equipment would likely extend beyond the construction footprint. Specific locations for staging areas have not yet been determined, but could include several areas such as the employee parking lot along the lagoon ditch drive east of the project site and possibly property leased from the Port of Port Angeles that is east of the paper mill.

2.2.2 OPERATIONS

Operation of the proposed biomass cogeneration project, in many regards, would be similar to the current operation of Boiler 8; that is, under the proposed project, many elements of boiler and turbine operations would be similar to operations under the No-Action Alternative. The following paragraphs describe conditions or activities where there would be expected changes from current operations; such changes would be relevant to potential environmental impact discussions in Chapter 3. The following paragraphs also describe those instances where current operations would not be expected to change as a result of the proposed project.

The new biomass cogeneration project would involve additional water demands for cooling needs of the condenser at the outlet of the steam turbine (Figure 2-2). In the SEPA EIS, the additional water demand was estimated to be as much as 3.2 million gallons per day over current needs that average 8 to 9 million gallons per day. Since that earlier document, Nippon has performed additional evaluations and developed design changes that would reduce water demand for the proposed project. Specifically, several cooling tower structures would be included in the process to reduce the temperature of the condensates discharged from the steam turbine generator. This would allow the condensate to be reused in the mill or in the boiler, effectively reducing the water demand. Nippon estimates that water demand would be as much as 1.2 million gallons per day over current needs (Perlwitz 2011a). Further, Nippon's evaluations indicate the added water demand would only be as high as 1.2 million gallons per day during summer months (July, August, and perhaps early September) when the temperature of the incoming water would go up, the efficiency of cooling the condensate would go down, and the mill's demand for steam would be at its lowest. During these periods, more water would be discharged as wastewater because its heat load would be more than the mill could absorb. Water needs, however, would continue to be met with the existing water rights held by the City of Port Angeles and within the terms of the current Water Supply Contract between the City and Nippon. No modifications to the existing water supply facilities and equipment are anticipated under the proposed project. Similarly, wastewater discharges would remain within existing water quality permit limits set by the mill's NPDES permit for Outlet 001 (Section 3.1.2.3).

Under the proposed project, the bulk of the biomass handling would occur within the new biomass storage building or silo rather than outside using heavy equipment as is done currently. (As noted previously, the silo configuration is included in the proposed design.)

Air pollution control equipment for the new boiler/cogeneration system would meet the regulations imposed under the *Clean Air Act* (42 U.S.C. 7401 *et seq*.) and the *Washington Clean Air Act* (Chapter 70.94 Revised Code of Washington), including Regulations of the Olympic Region Clean Air Agency. The regional regulations require new and modified sources of air emissions in attainment areas to employ BACT. The equipment would include an oversized electrostatic precipitator for control of particulate and multiple levels of air and combustion controls for various emissions. The new boiler would use ammonia or urea injection in the boiler flue gas to reduce emissions of nitrogen oxides. The system would also incorporate a two-stage condensing economizer into the off-gas after the precipitator to recover heat and to condense acid gases and additional hydrocarbons for removal (Nippon 2011). As identified in

the SEPA EIS, Nippon considered both trona[1] injection and wet scrubbing to remove acid gases. The air pollution control equipment that would be used on the proposed project, as BACT, represents an advance in technology and removal efficiency in comparison to that currently operating on the older generation boiler (see Section 3.1.2.1).

With the new biomass cogeneration system, the mill would need to purchase a larger quantity of biomass than under current conditions. In the SEPA EIS, the need was identified as about 160,000 bone-dry tons of biomass per year, compared with a current use of about half that quantity (that is, 80,000 bone-dry tons per year). The most recent Nippon Notice of Construction (NOC), developed as part of air permitting requirements (Section 3.1.2.1), includes an estimated biomass fuel need in the range of 170,000 to 201,000 bone-dry tons per year (excluding the water treatment sludge generated onsite). However, Nippon characterizes this as a conservatively high estimate to support a conservative estimate of air emissions and puts its current best estimate at the low end of that range (that is, about 170,000 bone-dry tons per year) (Smith 2011c). In the SEPA EIS, the number of trucks delivering biomass to the mill would increase from the current 20 to 25 per day to roughly 40 to 45 per day. It is assumed the higher estimate of needed biomass could add up to five daily deliveries to these numbers and, as appropriate, this EA evaluates the higher number of deliveries (that is, this EA evaluates 45 to 50 deliveries per day compared to the current 20 to 25 per day). These truck deliveries would occur 24 hours per day, but most would be expected between 7 a.m. and 7 p.m. All would be expected to use U.S. Highway 101 for access to the mill site; about 70 percent from the west and 30 percent from the east. Due to the improved combustion efficiency expected with the new boiler, the amount of ash that would be generated would not be expected to change from current levels and would continue to be disposed of in the mill's privately owned landfill. This landfill, permitted as a limited purpose facility, is south of the City of Port Angeles limits at 250 Weiler Road (off Monroe Road).

2.2.3 DECOMMISSIONING

At some time in the future, the cogeneration facilities constructed under the proposed project would be decommissioned and removed. For purposes of this EA, it is assumed that this might occur after 20 years of operation, but it is recognized that the equipment could be operational for a longer period of time, or that the facility could shut down earlier under some unforeseen circumstance. DOE also assumed that decommissioning would involve only the cogeneration facilities and that the surrounding areas would continue as a paper mill. That is, it is assumed that after decommissioning, the site of the cogeneration facilities would continue to be used for paper mill activities and would not be restored to "pre-paper mill" condition.

2.3 Alternatives

2.3.1 DOE ACTION ALTERNATIVE

The State of Washington's SEP funds are from a formula grant in which the amount of the grant to the State is determined pursuant to a formula established in DOE grant procedures at 10 CFR

1. Trona is a naturally occurring mineral, typically mined as a source of sodium carbonate and, if used, would be injected as a dry sorbent into the boiler's off-gas before it reached the precipitator.

420.11. Allocation of funds among the states is based on population and other factors. Recipients of these formula grants have broad discretion in how they use their funds.

This EA examines the potential environmental impacts of DOE's Proposed Action (providing funding for the proposed project) and the No-Action Alternative. This EA also summarizes alternatives that Nippon (sub-recipient) considered during development of its application to the State of Washington, which is the recipient of Federal funding under the SEP. Washington has informed DOE that it is not considering any project-specific alternatives for the Nippon Biomass Cogeneration Project beyond the grant and loan described in Section 2.2. This EA will provide DOE with the information needed to make an informed decision about whether allowing the State of Washington to provide some of its Federal funds for the proposed project might result in significant environmental impacts. Based on this EA, DOE either will issue a FONSI, which could include mitigation measures, or determine that additional study is needed in the form of a more-detailed environmental impact statement.

2.3.2 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, DOE would not allow the State of Washington to use its SEP funds for this project. DOE assumes for purposes of this EA that the project would not proceed without SEP funding. This assumption allows a comparison between the potential impacts of the project as proposed and the impacts of not proceeding with the project. Without the proposed project, Nippon operations would continue as otherwise planned, but without the proposed cogeneration system. Nippon would continue to use biomass in Boiler 8, but there would be no efficiency increase in the use of that energy source and there would be no co-generation of electricity. Boiler 8 would continue to emit air pollutants that, in most cases, are higher than under the proposed project, and the 20 megawatts of electricity not produced would continue to be produced at some other location using fossil fuel, so there would be no reduction in greenhouse gas emissions. Also, there would be no infusion of construction dollars and jobs into the area.

No-Action Alternative Subcategory – Boiler Replacement of Similar Size

DOE received comments criticizing the Draft EA for evaluating only two alternatives: the proposed project and the No-Action Alternative. The comments suggested that DOE evaluate another alternative, namely, replacement of Boiler 8 with a new, more efficient, similar-sized boiler, which would only supply the mill's steam needs and would not generate electricity for the grid (no cogeneration). As described in Section 2.3.3 of the EA, Nippon considered this option early in its project planning, but concluded that such a project would not have met the objectives of improving mill efficiency, retaining jobs through business diversification, and providing renewable power to the regional grid.

DOE's decision here will be limited to whether to authorize the State of Washington to use its SEP funds for the proposed project, which Washington identified as meeting the State's criteria and objectives for use of the funds and therefore selected for proposal to DOE for funding. DOE will use the analysis in this EA when making that decision. DOE could decide not to authorize this use of SEP funding. If DOE decided not to authorize the funding, Nippon could choose not to build the proposed project at all, as described above, or could pursue a variety of project alternatives, including, as one option, replacement of the existing boiler with a new, more

efficient replacement boiler of similar size to Boiler 8, but that would not include cogeneration of electricity. DOE considers the latter option as a subcategory of the No-Action Alternative because it could occur only if DOE did not fund the proposed project.

As another point of comparison and in order to respond to the comments, DOE presents an evaluation of the potential environmental impacts of a new, more efficient, similar-sized boiler in Section 3.2.2. Given the available information about the proposed project, DOE makes the following assumptions about this project alternative:

- As a replacement unit, the alternative boiler would go through the full air permitting process. It would be required to have air emissions control equipment similar to that described for the proposed project, including an electrostatic precipitator for control of particulate matter, an ammonia or urea injection system to reduce emissions of nitrogen oxides, and a wet scrubbing system to reduce volatile organic compounds, sulfur dioxide, and acid gases.

- The improved efficiency of the new boiler would result primarily in a reduced quantity of fuel oil being used in its operation while biomass quantities would remain about the same as at present.

- Since the mill would be processing about the same quantity of biomass as it does currently, the project alternative would not include an improved biomass handling system.

- Because there would be no turbine involved, the space needed would be less and the office building closest to the road would not be demolished.

- The proposed project's need for additional water was primarily due to the added cooling needs of the turbine. Without the turbine, the project alternative would not require additional water and there would be no new cooling tower units.

- Without the production of electricity from a renewable energy source, this alternative would likely not have qualified for consideration of SEP funding had it been proposed. Section 3.2 of this EA provides discussion of potential environmental impacts of the project alternative as a subcategory of the No-Action Alternative.

2.3.3 ALTERNATIVES CONSIDERED BY THE PROJECT PROPONENT

The Final SEPA EIS discusses project alternatives Nippon considered during its planning process for the proposed project (Port Angeles 2010a, p 15). In summary, Nippon considered alternative sites within the mill for the project, alternative sizes for the boiler and cogeneration facility, and alternative fuels for powering the boiler. Nippon believes the selected project site provides the best combination of accessibility to existing plant utilities and infrastructure, continued operation of the mill during construction, and minimization of potential impacts from construction. Nippon considered a smaller boiler that could have provided adequate steam for the mill, but Nippon believes that it would not have met project objectives of improving mill efficiency, retaining jobs through business diversification, and providing renewable power to the

regional grid, nor would it have optimized the use of biofuel from the Olympic Peninsula. The alternative fuels considered for a new boiler included natural gas, coal, electricity, and 100-percent oil, but were determined to be cost-prohibitive, involve potential adverse environmental impacts, or a combination of both.

As noted in Section 2.2, Nippon also evaluated a few alternatives to the specific manner in which the proposed project would be implemented; for example, in the type of facility that would be constructed for biomass storage (building or silo) and the type of air pollution control (wet versus dry scrubbers). Chapter 3 of this EA discusses these open decisions to the extent that they could affect environmental impacts from the proposed project.

2.4 Permits, Approvals, and Notifications

Prior to construction, Nippon would obtain all required Federal, State, and local permits and approvals. Because the proposed project represents a change within an existing facility already operating under multiple permits and approvals, permitting requirements are not as extensive as if it were an entirely new facility. The SEPA EIS identifies the following permits and approvals as being required:

- State Permits
  - Air Quality NOC Order of Approval
  - Air Operating Permit Modification
  - National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit Modification
  - Construction Stormwater General Permit

- Local Permits
  - City of Port Angeles Shoreline Substantial Development Permit
  - City of Port Angeles Conditional Use Permit
  - City of Port Angeles Building Permits
  - City of Port Angeles Noise Variance (if necessary)

On January 2, 2011, EPA rules went into effect requiring permits for GHG emissions under the Prevention of Significant Deterioration and Title V Operating Permit programs for new and existing emissions sources. Under the GHG Tailoring Rule issued earlier (May 13, 2010), EPA established a phased approach for implementing these permitting requirements to allow industry and State governments more time to prepare for the permitting process. Under the GHG Tailoring Rule, initial permitting requirements, including one step beginning in January 2011 and the second in July 2011, are limited to the largest sources of GHG emissions (EPA 2010a). Whether the proposed project would have triggered requirements under either of these initial steps would have been determined during the NOC process. However, on January 12, 2011, EPA announced its plan to defer GHG permitting requirements for emissions from biomass-fired and other biogenic sources for three years (EPA 2011a). The additional time will allow EPA to determine whether permitting under the *Clean Air Act* is required for these emissions.

DOE's involvement resulted in the need for another approval because the proposed project is located in the coastal zone of the State of Washington and has the potential to affect coastal uses

or resources. As a prerequisite to DOE authorizing Federal funding for the project, 15 CFR Part 930 (an implementing regulation of the *Coastal Zone Management Act*) requires that the project be verified as consistent with the State's approved coastal management program. In accordance with Washington's guidelines for its Coastal Zone Management Program, Federal actions that affect any land use, water use, or natural resource of the coastal zone must comply with the enforceable policies within the following six laws:

- The Shoreline Management Act;
- The State Environmental Policy Act;
- The Clean Water Act;
- The Clean Air Act;
- The Energy Facility Site Evaluation Council; and
- The Ocean Resource Management Act.

The process for evaluating such actions is termed "Federal consistency." In cases where the Federal action is to provide or authorize funding, the State guidelines require that the applicant for the funding prepare a Federal consistency certification, which includes a description of whether the project impacts coastal resources and, if so, a statement that the project is consistent with the six laws. In a letter dated April 22, 2011, the Environmental Review and Transportation Section of the Washington State Department of Ecology responded to Nippon with its concurrence that the proposed project is consistent with Washington's Coastal Zone Management Program (Ecology 2011).

2.5 Project Proponent-Committed Mitigation Measures

Nippon has committed to the following measures and procedures to minimize or avoid environmental impacts if the proposed project is implemented. The mitigation measures identified in the SEPA EIS or elsewhere are summarized below.

2.5.1 AIR QUALITY

The new boiler would have improved emissions control technologies and Nippon would use standard construction practices for dust suppression (for example, wetting unpaved areas and street sweeping of paved areas) to minimize fugitive dust impacts during construction (Port Angeles 2010a, pp 35 and 43).

2.5.2 WATER RESOURCES

Flood-proofing measures would be incorporated in buildings located in a flood zone. These would include elevation of the lowest floor above the flood elevation, making walls substantially impermeable to water, or creating structures that could resist hydrostatic and hydrodynamic loads (Port Angeles 2010a, p 46).

2.5.3 NOISE

Specific noise mitigation measures would not be determined until project construction criteria were developed; however, the following measures likely would be considered (Port Angeles 2010a, p 49):

- Require that all engine-powered equipment have mufflers;
- Unless authorized by a variance, prohibit operating construction equipment within 1,000 feet of occupied residences during nighttime, Sundays, or holidays;
- Require that all equipment comply with pertinent equipment noise standards;
- Limit jackhammers, concrete breakers, saws, and other demolition equipment to daytime hours;
- Perform regular inspections of equipment mufflers;
- Install temporary or portable acoustic barriers where feasible;
- Locate stationary construction equipment as far from noise-sensitive properties as possible;
- Shut off idling equipment;
- Notify nearby residents of upcoming extremely noisy work;
- Restrict use of back-up beepers during evenings and nighttimes; and
- Consider using auger cast piles instead of pile driving.

2.5.4 CULTURAL RESOURCES

Construction activities would be conducted in accordance with an MOA among Nippon, the State, DOE, and the Lower Elwha Klallam Tribe. The MOA would direct agreed-upon measures to minimize the potential for adverse impacts to cultural resources. The MOA, signed by each of the participating parties, describes the specific archaeological work that would be done before and during construction. The MOA, with its associated ARMP, is described further in Section 3.1.2.2 of this EA.

Prior to DOE's pursuit of an MOA under Section 106, Nippon recognized the cultural and historic resources potentially associated with the proposed project site. Nippon anticipated the implementation of mitigation measures, including development of an Inadvertent Discovery and Archaeology Monitoring Plan, which would be intended to ensure proper treatment of any archaeological materials or human remains that might be encountered and which would require professional archaeological monitoring of ground disturbances (Port Angeles 2010a, pp 51-52).

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

This chapter examines the potential environmental impacts of the proposed project and the No-Action Alternative on the affected environmental resource areas.

3.1 Proposed Project

Consistent with NEPA implementing regulations and guidance, DOE focuses the analysis in an EA on topics with the greatest potential for significant environmental impact. For the reasons discussed below, the proposed project is not expected to have any measurable effects on certain resources; therefore, these resources are not carried forward for further analysis.

3.1.1 CONSIDERATIONS NOT CARRIED FORWARD FOR FURTHER ANALYSIS

3.1.1.1 Land Use

The proposed project would take place within the existing Nippon paper mill site and would involve supplementing existing facilities and equipment with similar facilities and equipment. The actions would take place on land already disturbed and already used for industrial purposes. The actions would not represent a change of land use. The steam turbine generator and associated production of electricity would be a new function to the paper mill, but no new transmission lines outside of the mill would be needed, and locating a 20-megawatt turbine in a facility within the mill site would not be considered a significant change to the mill's operation or appearance.

The SEPA EIS addresses effects of the proposed project on recreational features in the area of the paper mill; specifically it addresses effects on the Waterfront Trail, a feature owned and maintained by the City of Port Angeles and which passes through the mill site alongside Marine Drive (Figure 2-3). Since the paper mill was already in place when this trail was designated and the mill is a recognized feature of the trail, there would be no change in land use regarding the trail. Therefore, any impacts to the trail are addressed in this EA in the discussion of aesthetics and visual resources (Section 3.1.2.5).

3.1.1.2 Geology and Soils

Construction would occur on previously disturbed areas with surface materials (under the pavement) consisting of fill brought in for earlier construction. Preliminary project plans have identified the potential need to replace the existing fill material with soil or fill with improved bearing and compaction characteristics, depending on the final geophysical design for the new buildings. The new facilities would also require installation of deep piles extending below the ground about 70 feet, well into the underlying glacial till, to provide the necessary foundation. Actions would be taken during construction to minimize soil erosion. Storm water runoff would be controlled and monitored during construction in accordance with the Washington State Construction Stormwater General Permit (see Section 2.4 of this EA) and the mill's existing NPDES permit. The combination of these storm water control measures and the relatively flat topography of the area would minimize any potential for soil erosion problems.

Like most of the West Coast, the Olympic Peninsula is considered one of the most seismically active regions in the United States. In the old Uniform Building Code, the area was listed in Zone 3, where Zone 0 indicates little if any risk from earthquakes and Zone 4 poses the highest risk. In the area of the proposed project, an earthquake could also trigger a tsunami event or, as a result of the shaking, cause liquefaction of the sands and sediments that form the upper portion of Ediz Hook. These are recognized conditions of the project site and the new facilities would be required to incorporate the necessary seismic design to minimize the potential for facility damage from earthquakes and related events. The project would neither affect nor be adversely affected by site geology, other than the regional potential for earthquakes and being required to adhere to appropriate facility design standards. DOE notes that the mill has been operating at this location for over 90 years.

3.1.1.3 Water Resources – Groundwater

The City of Port Angeles obtains its drinking water from groundwater, and there would be additional demands on the City's water system during construction, but operation of the proposed cogeneration equipment and facilities would not involve additional drinking water demand from the mill. The need for additional drinking water during construction, because it would be short-term, would not be expected to have any lasting impact on groundwater resources. As a result, this water demand is discussed in Section 3.1.2.12 in terms of how it would affect the City's water utility system. There would be no other use of groundwater in the proposed project and no other project actions that would present new potential sources of groundwater contamination or that could otherwise adversely affect groundwater.

3.1.1.4 Intentional Destructive Acts

DOE considers intentional destructive acts (i.e., acts of sabotage or terrorism) in all its EAs and EISs (DOE 2006). Construction and operation of the proposed project would not involve the transportation, storage, or use of radioactive, explosive, or toxic materials. The proposed project would not offer any particularly attractive targets of opportunity for terrorists or saboteurs to inflict adverse impacts on human life, health, or safety.

3.1.2 CONSIDERATIONS CARRIED FORWARD FOR FURTHER ANALYSIS

This section of the EA examines in detail the potential environmental impacts of the proposed project on the following resource areas:

- Air quality
- Cultural resources
- Water resources – surface water
- Biological resources
- Aesthetics and visual resources
- Noise
- Human health and safety
- Transportation
- Socioeconomics
- Environmental Justice

- Waste and Hazardous Materials
- Utilities and energy

As mentioned in Section 1.1 of this EA, the SEPA EIS evaluated many of these resource areas. Throughout the remainder of this chapter, this EA summarizes and incorporates by reference the appropriate sections of the SEPA EIS.

3.1.2.1 Air Quality

This section presents a description of the existing air quality in the region by comparing ambient conditions with National Ambient Air Quality Standards and by describing the amount of air pollutants emitted per year, both within all of Clallam County and from current operations of Boiler 8 within the Nippon paper mill. Direct and indirect impacts are then evaluated by presenting annual emissions projected for the new cogeneration equipment for comparison with the existing annual emissions. The evaluation also presents results from air modeling performed on the emissions from the new cogeneration equipment to project their effect on the local area's ambient air quality. The air modeling effort represents a key element for determining compliance with National Ambient Air Quality Standards and for determining permitting requirements applicable to the proposed project. DOE presents and references information from the latest NOC, including modeling results, Nippon submitted to the Olympic Region Clean Air Agency (ORCAA). DOE reviewed the information submitted by the applicant to the ORCAA, but did not perform independent modeling. The permitting process and associated ORCAA review will provide the ultimate test of the emissions estimates and the modeling results.

This section's discussion of direct and indirect impacts also addresses air quality conformity requirements under the *Clean Air Act* and the potential cumulative effects the proposed project could have on climate change in terms of GHG emissions.

Existing Ambient Air Quality

The ambient air quality in an area can be characterized in terms of whether it complies with the primary and secondary National Ambient Air Quality Standards. The *Clean Air Act* requires the EPA to set national standards for pollutants considered harmful to public health and the environment. National Ambient Air Quality Standards have been established for six criteria pollutants: carbon monoxide; lead; nitrogen dioxide; ozone; particulate matter (including particulate matter with both an aerodynamic size less than or equal to 10 microns and less than or equal to 2.5 microns); and sulfur dioxide. Primary standards define levels of air quality the EPA has determined necessary to provide an adequate margin of safety to protect public health, including the health of "sensitive" populations such as children and the elderly. Secondary standards define levels of air quality deemed necessary to protect the public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Table 3-1 lists the primary standards for each criteria pollutant from the National Ambient Air Quality Standards. Regions that are not in compliance with the standards are designated "nonattainment" areas. Also shown in Table 3-1 are the most recent records available in EPA's AirData database for ambient air quality levels in Clallam County, Washington, which includes the City of Port Angeles. Clallam County is currently classified as an attainment area for all criteria pollutants (EPA 2010b), which is consistent with the latest ambient air quality data

Table 3-1. Summary of Air Quality Standards, plus Baseline Air Quality Levels and Air Emissions in Clallam County

	Ambient Air Quality Levels			Annual Air Emissions (in tons)			
	National Ambient Air Quality Standards[a]		2008 Ambient Air Quality Levels in Clallam County[b]	All Clallam County in 2002[c]		Nippon Paper Mill Boiler 8[d]	
Pollutant	Averaging Period	Primary Standard		Point Sources	Non-Point Sources	2-Year Min.	2-Year Max.
Carbon monoxide	8 hours	9 ppm	0.3 ppm	918	31,903	53.3	728
	1 hour	35 ppm	0.3 ppm				
Lead	Rolling 3-month	0.15 µg/m^3	NA	0.001	0.38	NA	NA
Nitrogen dioxide	Annual	0.053 ppm	NA	326	17,448	138.9	177.7
	1 hour	0.100 ppm	NA				
Ozone	8 hours	0.075 ppm	0.058 ppm	41[e]	6,645[e]	0[e]	0[e]
	1 hour	0.12 ppm	0.064 ppm				
PM_{10}	24 hours	150 µg/m^3	NA	119	2,932	41.7[f]	115
$PM_{2.5}$	Annual	15.0 µg/m^3	NA	108	2,062	50.0[f]	115
	24 hour	35 µg/m^3	NA				
Sulfur dioxide	Annual	0.030 ppm	0.000 ppm	758	7,568	112.1	284.7
	24 hours	0.14 ppm	0.000 ppm				
	1 hour	0.075 ppm	NA				

a. Source: 40 CFR 50.4 through 50.13.
b. Source: EPA 2009a.
c. Source: EPA 2009b, 2009c.
d. Source: Nippon 2011, these values are minimum and maximum 2-year averages over the years 2001 through 2009.
e. The values shown here are for emissions of volatile organic compounds, an ozone precursor.
f. The low, 2-year average for PM_{10} occurred over 2001 to 2002, but $PM_{2.5}$ was not reported prior to 2003. Had $PM_{2.5}$ been reported in 2001 and 2002, it could not have been higher than the PM_{10} value for that period as might be inferred from the data in the table.

ppm = parts per million.
µg/m^3 = micrograms per cubic meter.
PM_{10} = particulate matter with an aerodynamic diameter of 10 micrometers or less.
$PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 micrometers or less.
NA = not available.

shown in the table, although no ambient air concentrations were available for nitrogen dioxide, particulate matter, or lead. Historical data from EPA's Green Book database indicate no record of nonattainment issues for Clallam County from 1992 through 2010 (EPA 2010b). Also shown in Table 3-1 are the total emissions of criteria pollutants from point sources and non-point sources (which include mobile sources) within the county during the year of 2002 (the most recent year of record in EPA's AirData database for annual emissions). Finally, the last column of the table shows representative annual emissions from Boiler 8 of the Nippon paper mill during the period from 2000 through 2009. The Boiler 8 emissions cannot be compared directly with the overall County emissions because they are from different years. For example, the NOC identifies Boiler 8 emissions of PM_{10} as 41.4 tons in 2002, the year of the County emission data, compared with the 115 tons shown in the table. However, it appears clear that the Nippon paper mill represents a significant portion of the County's point source emissions.

Direct and Indirect Impacts

Air emissions during construction of the proposed project would consist largely of vehicle and equipment exhaust. Fugitive dust would also be generated by earth movement, vehicle traffic over dirt or dirty surfaces, and by demolition of existing structures. Standard construction

practices for dust suppression would be used as necessary in order to minimize the potential for adverse impacts to air quality from particulate matter. Compliance with State standards would require work practices to include efforts such as water application to unpaved areas to keep dust production down. Nippon has also indicated it would use street sweeping to keep paved areas clean and that a fugitive dust control plan complying with State requirements would be developed for implementation during project construction. If any hazardous materials, such as asbestos, were encountered during facility demolition, Nippon would implement appropriate guidelines and regulatory requirements to ensure worker safety and control emissions. The vehicle and equipment exhaust and fugitive dust emissions associated with construction would occur for 14 to 18 months and would be expected to represent only a minor increase over existing mill emissions. Mill operations, which involve large amounts of vehicle and equipment usage, would continue during the localized construction action. The added emissions would not be expected to have an effect on ambient air quality of the area and do not warrant further analysis.

Once the proposed project was in operation, air emissions of the paper mill would change as a result of the new boiler. The new turbine generator would be driven by steam from the boiler and would not involve emission of additional air pollutants. As described in Section 2.2, the new boiler would be larger than the existing Boiler 8, but would incorporate BACT for controlling air pollutants. At this time, the primary air emission control elements planned for the boiler and its off-gas system are as follows:

- An electrostatic precipitator for controlling particulate emissions,
- Multiple levels of air and combustion controls for various emissions,
- Selective non-catalytic reduction involving the injection of ammonia or urea to control emissions of nitrogen oxides, and
- A two-stage condensing economizer to control acid gases and volatile organic compounds.

At the time the Draft EA was prepared, the air permitting process with the ORCAA was still ongoing. As of March 4, 2011, Nippon's application was considered complete (ORCAA 2011), but ORCAA's evaluation was still underway. Results of ORCAA's evaluation and its recommendations with regard to the permit are addressed later in this section.

ORCAA is a special-purpose regional government agency charged with administering Washington State and Federal Government air regulations, and its jurisdiction includes Clallam County as well as several other counties in western Washington. The initial step in the process of obtaining an air permit is filing an NOC application with ORCAA. Nippon started this process for the proposed project in July 2010. The NOC, which has been revised several times as part of the permitting process, characterizes the air emissions from the proposed project, identifies the applicable regulatory requirements that must be met, proposes the emission control equipment that will meet requirements, and demonstrates by air modeling that the proposed emissions would not result in violations of air quality standards or be a human health threat. Table 3-2, which is laid out in similar fashion to Table 3-1, summarizes key information from the

Table 3-2. Summary of Air Quality Standards, plus Air Quality Levels and Air Emissions in Clallam County

Pollutant	Ambient Air Quality Levels			Annual Air Emissions (in tons)			
	National Ambient Air Quality Standards[a]		Modeled Levels - Proposed Project plus Baseline ($\mu g/m^3$)[b,c]	Proposed project (new) boiler[b]	Baseline Boiler 8[b]		Change with new system[d]
	Averaging Period	Primary Standard			2-Year Min.	2-Year Max.	
Carbon monoxide	8 hours	10,300 $\mu g/m^3$	148	643.9	53.3	728	-84.1
	1 hour	40,100 $\mu g/m^3$	512				
Lead	Rolling 3-month	0.15 $\mu g/m^3$	0.065	0.09	NA	NA	+0.09[f]
Nitrogen dioxide	Annual	100 $\mu g/m^3$	5.1	184[e]	138.9	177.7	+6.3
	1 hour	188 $\mu g/m^3$	176.5				
PM_{10}	24 hours	150 $\mu g/m^3$	2.0	36.8	41.7g	115	-78.2
$PM_{2.5}$	Annual	15.0 $\mu g/m^3$	0.3	36.8	50.0g	115	-78.2
	24 hour	35 $\mu g/m^3$	2.0				
Sulfur dioxide	Annual	80 $\mu g/m^3$	3.2	152	112.1	284.7	-132.7
	24 hours	365 $\mu g/m^3$	40.25				
	1 hour	197 $\mu g/m^3$	195				
VOCs				35.8	0	0	+35.8[f]
Sulfuric acid mist				7.6	NA	15.9	-8.3
Fluorides				0.4	NA	NA	+0.4[f]

a. Source: 40 CFR 50.4 through 50.13 - The parts per million values shown in Table 3-1 were converted to $\mu g/m^3$ values (at 1 atmosphere and 25 degrees Celsius) and rounded to 2 or 3 significant figures.
b. Source: Nippon 2011. Proposed numbers come from Table 2-5 of the source document. Baseline values for carbon monoxide, nitrogen dioxides, sulfur dioxide, PM_{10}, and $PM_{2.5}$ are minimum and maximum 2-year averages over the years 2001 through 2009.
c. Emission estimates for the proposed new boiler are based on the installation of BACT.
d. As described further in the text, the change values represent the difference between the proposed project and the maximum 2-year average values from the baseline, and are based on the assumption that Boiler 8 does not operate. However, Nippon is proposing in the NOC that Boiler 8 be allowed to operate up to 15 days per year as a backup to the new boiler.
e. This value is the maximum nitrogen dioxide emissions proposed in the NOC.
f. The text of this section includes significant caveats regarding the "change" values for lead, VOCs, and fluorides.
g. The low, 2-year average for PM_{10} occurred over 2001 to 2002, but $PM_{2.5}$ was not reported prior to 2003. Had $PM_{2.5}$ been reported in 2001 and 2002, it could not have been higher than the PM_{10} value for that period.

$\mu g/m^3$ = micrograms per cubic meter.
PM_{10} = particulate matter with an aerodynamic diameter of 10 micrometers or less.
$PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 micrometers or less.
NA = not available.
VOCs = volatile organic compounds (an ozone precursor).

Nippon NOC with regard to the proposed project and criteria pollutants. The annual air emissions for the proposed project were developed using conservative assumptions and should be considered maximum values. Also, as addressed in more detail later in the discussion, the table includes a simplification with regard to the annual emissions because the "proposed project" and "change" values are based on the scenario of Boiler 8 not operating for the entire year.

The second, third, and fourth columns of Table 3-2 show the results of Nippon's air modeling efforts in comparison with ambient air quality standards. As can be seen in the table, the predicted ambient air quality, with emissions from the proposed project included, would be within standards. That is, with the proposed project in place, Clallam County would be expected to maintain its attainment status for all criteria pollutants. For most of the pollutants, the

predicted (modeled) concentrations are only a small portion of the applicable standard, particularly in the case of the longer averaging periods, such as the standards for the annual averages. The predicted levels closest to the pollutants' standards would be the 1-hour concentrations for nitrogen dioxide and sulfur dioxide. For nitrogen dioxide, the predicted level of 176.5 micrograms per cubic meter is 94 percent of its standard and for sulfur dioxide, the modeled result of 195 micrograms per cubic meter is 99 percent of its standard.

The predicted 1-hour concentration for sulfur dioxide is the closest to its standard, but in this case the sulfur dioxide emission rate included in the model was adjusted per discussions with ORCAA to establish a maximum value that would still allow the 1-hour standard to be met. The emission rate of 56 pounds per hour that was included in the model is about 60 percent greater than the 34.7 pounds per hour derived from the conservatively high annual emission rate shown in Table 3-2. Had the lower value been used in the model, the predicted ambient air concentrations would have been similarly reduced.

The predicted 1-hour concentration for nitrogen dioxide was also the result of a modified evaluation based on discussions with ORCAA. The NOC reports that in the case of nitrogen dioxide, emissions from Peninsula Plywood Group's (or "PenPly" as identified in the NOC) existing boiler were included with those from the proposed new boiler. PenPly is a plywood manufacturing facility located on Marine Drive just over a mile to the southeast from the Nippon mill. The modeled 1-hour concentration of nitrogen dioxide from these two sources was 120.5 micrograms per cubic meter. A nitrogen dioxide concentration of 56 micrograms per cubic meter was then taken from a Washington Department of Ecology background map and added to the modeled value. The result of this conservative approach, at 176.5 micrograms per cubic meter (Table 3-2), still indicated compliance with the standard.

The last four columns of Table 3-2 provide a summary of annual emissions from the proposed project compared with existing emissions (from Boiler 8). The last column of the table presents the difference in annual air emissions from the proposed project and the maximum 2-year averages of the baseline emissions. The estimated emissions for the proposed project are maximum values, based on a reasonable maximum level of operations; comparing those estimates with maximum baseline values is not only the approach applicable to the permitting process, it is the most appropriate comparison because it considers "like" levels of before and after operations (that is, it compares maximums to maximums). As can be seen in the table, the improved and additional air emission controls would result in reduced emissions of many of the criteria pollutants in spite of the new boiler burning about twice as much biomass fuel. Emissions of carbon monoxide, particulate matter, and sulfur dioxide would each be expected to decrease. The increase in volatile organic compounds shown in the table warrants additional discussion as noted in the NOC. The proposed project's volatile organic compound emissions are based on emission factors without the condensing economizer. Past monitoring results from Boiler 8, which has a similar device, indicated volatile organic compound emissions were below detection levels that would put emissions at less than 1 ton per year (Nippon 2011). Accordingly, actual emissions from the proposed project, with the condensing economizer in place, would be expected to be well below the 35.8 tons per year shown in the table. Further, the small amount of lead included in the proposed project emissions would come from the biomass and oil fuels that would be used in the new boiler (Nippon 2011). There would be no reason to suspect that fuels used in Boiler 8 were any different in this regard, but there are no data

available on past lead emissions, so the difference shown in the table may be misleading with regard to lead. The same argument can be made with regard to anticipated minor emissions of fluorides; that is, the source of the fluorides should be applicable to current operations, but no emission information is available. That leaves nitrogen dioxide as the only pollutant shown in the table for which real increases in emissions would be expected.

As noted previously, the "change with new system" values presented in the last column of Table 3-2 are based on the premise that the Boiler 8 emissions would be totally eliminated. As described in Section 2.2, Nippon would maintain Boiler 8 in an operating condition for backup during times the new boiler was down, so the "change" values are a simplification compared with scenarios in which Boiler 8 would be used for limited amounts of time. Under the terms presented in the NOC, operation of Boiler 8 would be limited to 15 days per year and it would not be run at the same time as the new boiler except during startup and shutdown of the new boiler. In order to address the maximum possible future emissions, the NOC included an evaluation in which Boiler 8 was operated for 15 days and the new boiler was down for 15 days and estimated emissions were modified accordingly. Under this evaluation, carbon monoxide and particulate matter would be slightly higher than operating the new boiler full time. Changes in other pollutants would be negligible or slightly lower than operating the new boiler full time. As proposed in the NOC, Boiler 8 would still be required to meet its permit limits and in the case of nitrogen oxides, the combined emissions from both Boiler 8 and the cogeneration plant would be required to be within the emissions limits set under the new permit.

One additional item should be noted with regard to the information in Table 3-2. Although there are separate numbers shown for emissions of particulate matter in the form of PM_{10} and $PM_{2.5}$, they represent the same quantity of material. Air emission estimates include the prediction that all particulate matter from the new boiler's off-gas system would be $PM_{2.5}$, which by definition also qualifies as PM_{10}.

Other conclusions presented in the NOC for ORCAA review and concurrence include the following:

- Fugitive emissions consisting of particles generated during the handling of biomass fuel and transporting the fuel and ash around the mill would be minor under the proposed project. These emissions are estimated at about 0.14 ton per year and because of improved fuel handling capabilities and shorter travel distances, this quantity is slightly less than the corresponding estimated emissions for current, baseline conditions.

- With Nippon proposing an enforceable permit limit or cap on emissions of nitrogen oxides at 184 tons per year, the increases in specific pollutant emissions would not be large enough to trigger permit requirements under the Prevention of Significant Deterioration regulations (40 CFR 52.21 and WAC 173-400-700). To be a "significant" net emissions increase triggering Prevention of Significant Deterioration permitting requirements, the nitrogen oxides emissions increase would have to be 40 tons or more per year. As shown in Table 3-2, the proposed permit cap of 184 tons per year would result in an increase of 6.3 tons per year over current operations.

- The technology proposed for the control of nitrogen oxides (that is, selective non-catalytic reduction) involves injection of urea or ammonia into the boiler's hot flue gas and has the potential to result in the release of ammonia. If not enough ammonia (or urea) was added, nitrogen oxides emissions would be too high; if too much was added, some would slip through the system and be released to the atmosphere. This situation would be addressed by including a limitation for ammonia releases in the permit. (Ammonia, a colorless gas with a pungent odor, can be poisonous if inhaled in large quantities and is irritating to eye, noise, and throat in lesser amounts.)

- New Source Performance Standards for Industrial-Commercial-Institutional Steam Generating units (40 CFR Part 60, Subpart Db) are applicable to the proposed project. The corresponding emission limits for sulfur dioxide would be met through Nippon's commitment to use only ultra-low-sulfur oil in the new boiler and its proposal to have an enforceable limit of firing the new boiler with oil for less than 10 percent of capacity. Nippon further commits to the new boiler's ability to meet the particulate and opacity requirements for burning wood with some oil.

- Expected emissions of hazardous air pollutants from the new boiler, as detailed in the NOC, would be below levels to qualify as a major source of such pollutants. Criteria for a major source are the potential to emit more than 10 tons per year of any single hazardous air pollutant or more than 25 tons per year of any combination of hazardous air pollutants. Per the evaluation presented in the NOC, the single such pollutant with the highest expected emission would be hydrogen chloride at about 9 tons per year and the combined total of all expected hazardous air pollutants emissions would be about 18.1 tons per year.

- State air regulations (Chapter 173-460 WAC) require a demonstration that emissions of toxic air pollutants would not result in a threat to human health. The evaluation of potential toxic air pollutants presented in the NOC indicates that emission rates would either be below a small quantity emission rate or, from modeling results, levels at receptors would be below the acceptable source impact level. Per the WAC, establishing that either of these criteria is met provides verification that the emissions of the pollutant would not cause a human health problem and no further analysis is required.

The above discussion reflects the information contained in Nippon's permit application. At the time the Draft EA was released for public comment, the ORCAA was still evaluating Nippon's permit application. On April 15, 2011, the ORCAA issued its "Staff Recommendation for Notice of Construction 10NOC763" with a preliminary determination to conditionally approve the NOC for the Nippon project (ORCAA 2011e). This Staff Recommendation is subject to a public comment period, which ended May 17, 2011, and the ORCAA scheduled a public meeting in Port Angeles for that same date. In addition to identifying the intent to approve the NOC, the Staff Recommendation presents several significant evaluation findings and newly established requirements, including the following:

Boiler 8 can be maintained to provide backup to the proposed boiler, but its use would be limited to 360 hours (15 days) per year and it would be converted to burn only ultra-low sulfur diesel

fuel. (Continued combustion of biomass in Boiler 8 as proposed in the NOC would not be allowed as part of its backup role.)

The ORCAA accepted the NOC's evaluation of BACT and achievable emission limits with the exception of those for sulfur dioxide. The permit would reduce the proposed limit for sulfur dioxide by 50 percent, which would, in turn, also reduce the proposed limit for sulfuric acid by 50 percent. (Sulfur dioxide and sulfuric acid emissions would be limited to 76 and 3.8 tons per year, respectively, which represent half of the proposed project's annual emission values shown in Table 3-2 for these parameters.)

The ORCAA's evaluations found the NOC's air modeling and its conclusions (that is, the expected ambient air concentrations) to be acceptable and agreed with the NOC's conclusion that toxic air pollutants would be sufficiently low to protect human health and safety.

New emission limits set by 40 CFR Part 63 Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants at Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters, would be incorporated into the permit and be in effect at the time of startup.

The reduction in allowable sulfur dioxide emissions would require Nippon to add additional pollution control capabilities to the boiler's off-gas system. ORCAA identified pH conditioning of the condensing economizer water as a likely means to achieve the reduced limits, but also identified trona injection, or reducing the amount of wastewater treatment sludge combusted as possible options. Ending the use of biomass in Boiler 8's standby role would eliminate any concern of higher particulate emissions during such times that Boiler 8 was in use.

The ORCAA will continue to take the necessary actions with respect to the Nippon air permit and will determine the propriety of allowing Nippon to proceed. Operation of the proposed project's facilities would be subject to emissions limitations and monitoring and other requirements set in the final Order of Approval issued by the ORCAA.

As noted above, the NOC included an evaluation of fugitive dust emissions with the mill from mobile sources that included material (biomass) handling and traveling on paved roads. The evaluation concluded that future emissions of particulate matter from these sources, at 0.14 ton per year, would be very similar to, and even slightly less than, current conditions, which were estimated at 0.15 ton per year (Nippon 2011). The detailed calculations in the NOC show that the increased vehicle traffic associated with delivering more biomass fuel to the mill would be more than offset by the decrease in the use of mill equipment (such as front loaders) that would be attributed to use of the new biomass storage facility. Although the NOC only presented these emissions estimates for particulate matter, similar results would be expected, were an evaluation of vehicle exhaust emissions performed. That is, exhaust emissions from delivery trucks would increase, but exhaust emissions from mill equipment would decrease. Based on the evidence presented in the NOC, DOE believes a detailed evaluation of changes in vehicle exhaust emissions would show only minor differences and is therefore not warranted. (Note: In several locations in this chapter, DOE describes changes in evaluations as a result of an increase in the amount of biomass that would be required by the proposed project. These changes are with regard to evaluations described in the SEPA EIS. Evaluations in the NOC are up to date and are based on the increased biomass quantities.)

Workforce additions and the associated commute to the work site could also result in changes to exhaust emissions from personal vehicles. Since Nippon expects there would be only one additional mill worker under the proposed project, increases from personal vehicle emissions would be minor and, like those from mill equipment, do not warrant a detailed evaluation.

The SEPA EIS describes reduction of slash burning as an air quality benefit that would be associated with the proposed project. The basis for this conclusion is that the increased demand for biomass with the proposed project would reduce the amount of slash burning in Clallam County. The SEPA EIS also describes the potential for the proposed project to affect air quality within the nearby Olympic National Park, which at its closest is only 6 to 7 miles to the south and which has been designated as a particularly sensitive, Class I area under the *Clean Air Act*. The conclusion of the evaluation is that the air quality of the park would not be adversely impacted and would continue to meet Class I air quality standards. These additional evaluations are noted here, but further detail is left to the discussion in the SEPA EIS.

Air emissions during eventual decommissioning of the cogeneration facilities would be very similar to those generated during construction. That is, they likely would be limited to vehicle and equipment emissions and fugitive dust. Nippon would implement standard practices for dust suppression, as described for construction.

Air Quality Conformity

Section 176(c)(1) of the *Clean Air Act* requires Federal agencies to ensure that their actions conform with applicable implementation plans for the achievement and maintenance of the National Ambient Air Quality Standards for criteria pollutants (DOE 2000). To achieve conformity, a Federal action must not contribute to new violations of standards for ambient air quality, increase the frequency or severity of existing violations, or delay timely attainment of standards in the area of concern. The EPA general conformity regulations (40 CFR 93, Subpart B) contain guidance for determining whether a proposed Federal action would cause emissions to be above specified levels in nonattainment or maintenance areas.

The project would not involve emissions of criteria air pollutants in a nonattainment or maintenance area. Therefore, conformity review requirements do not apply to the project. Similarly, the No-Action Alternative would involve continuation of air emissions, but again the conformity determination requirements would not apply.

Greenhouse Gas Emissions

While the scientific understanding of climate change continues to evolve, the Intergovernmental Panel on Climate Change Fourth Assessment Report has stated that warming of the earth's climate is unequivocal, and that warming is very likely attributable to increases in atmospheric greenhouse gases caused by human activities (anthropogenic) (IPCC 2007). The Panel's Fourth Assessment Report indicates that changes in many physical and biological systems, such as increases in global temperatures, more frequent heat waves, rising sea levels, coastal flooding, loss of wildlife habitat, spread of infectious disease, and other potential environmental impacts are linked to changes in the climate system, and that some changes may be irreversible (IPCC 2007).

CARBON DIOXIDE EQUIVALENT EMISSIONS

Carbon dioxide equivalent is a measure used to compare greenhouse gases based on their global warming potential (GWP), using the functionally equivalent amount or concentration of carbon dioxide as the reference. The carbon dioxide equivalent for a gas is derived by multiplying the amount of the gas by its GWP; this potential is a function of the gas' ability to absorb infrared radiation and its persistence in the atmosphere after it is released. The Intergovernmental Panel on Climate Change utilizes the 100-year GWPs to determine carbon dioxide equivalents. GWPs for common GHGs can be found at http://unfccc.int/ghg_data/items/3825.php.

In the Draft EA, much of the discussion of greenhouse gases associated with the proposed project was based on the presentation in the SEPA EIS (Port Angeles 2010a, pp 39-43), which was done using the premise that biomass combustion should be considered carbon neutral. Very simply, the basis for this premise is that as long as biomass resources are managed sustainably (that is, the resource's rate of carbon absorption is maintained or increased), the combustion of harvested materials presents no net increase of carbon to the ongoing carbon cycle and, therefore, should not be considered an increase to greenhouse gases. This is contrasted to the combustion of fossil fuels which emits carbon that has been sequestered, out of the current carbon cycle, for millennia (CEQ 2010b).

Responsible Opposing Views. Several commenters on the Draft EA argued against the premise of carbon neutrality. These commenters contended that the combustion of biomass represents a very rapid emission of greenhouse gases into the atmosphere when compared with the much slower rates of emissions from natural decay or of carbon absorption by living biomass, causing an immediate carbon debt that cannot be paid back for tens to hundreds of years, resulting in associated adverse impacts to climate change in the interim. Some commenters stated that, in some ways, combustion of biomass would result in greater GHG emissions than combustion of fossil fuels because greater quantities of biomass must be burned to retrieve a set amount of energy. Commenters also expressed a concern that considering biomass combustion as carbon neutral will greatly increase demand for forest materials solely for energy recovery, putting too much pressure on the country's forested lands, eventually leading to over-harvesting.

DOE recognizes that the premise of carbon neutrality is currently the subject of debate; this issue is more complicated than the simple description above. The U.S. Environmental Protection Agency (EPA) has recently concluded that the manner in which GHGs from biogenic sources are regulated needs to be rethought. As described in Section 2.4 of this EA, EPA has deferred GHG permitting requirements for emissions from biogenic sources for three years. Prior to reaching this decision, EPA issued a "Call for Information: Information on Greenhouse Gas Emissions Associated with Bioenergy and Other Biogenic Sources" (75 FR 41173, July 15, 2010). In the Call for Information, EPA stated that "...both a default assumption of carbon neutrality and a default assumption that the greenhouse gas impact of bioenergy is equivalent to that of fossil fuels may be insufficient because they may oversimplify a complex issue." Thus, EPA identified the possible need for alternative methods of calculating GHG emissions associated with bioenergy. EPA's goal during the three-year deferral period is to develop an approach to account for biogenic emissions in ways that are scientifically sound and manageable in practice (EPA 2011b).

DOE Evaluation. In the absence of scientific consensus on *default* assumptions (i.e., assumptions that may be presumed to apply in all or most circumstances) regarding carbon neutrality, analysis of *specific* projects is nevertheless possible. Accordingly, DOE has analyzed the climate change implications of the proposed project based on the specific facts and circumstances of the proposal. DOE concludes that the proposed project most likely would result in a net decrease in GHG emissions.

In reaching this conclusion, DOE considered the key technical issues in the debate regarding the assessment of GHG emissions from bioenergy development as applied to this specific project. The primary issue regards whether an action would result in indirect land use changes that would increase GHG emissions (e.g., clear-cutting of forests). In this particular case, the proposed project would not result in indirect land use change because Nippon would obtain forest slash from existing logging operations, which are being managed to be a sustainable use of forest products. DOE also considered the issue of how to account for a potential "carbon debt" resulting from differences in the rate of release of GHGs under the proposed project in comparison with natural decay. Although there are differing technical views on this general issue, under the proposed project, GHG reductions attributable to electricity production that would be eliminated from elsewhere on the grid would most likely more than offset any "carbon debt" over the long-term when natural decay is considered (see Tables 3-3 and 3-4). Further discussion of DOE's analysis and consideration of opposing viewpoints follows.

DOE received comments stating that the EA should present a complete estimate of GHG emissions associated with the proposed project without consideration of whether biomass combustion is carbon neutral. In response to these comments, and in view of EPA's ongoing efforts to develop methodologies for regulatory purposes to assess the atmospheric impact of biogenic emissions, DOE revised the EA to present all GHG emissions from operations without regard to assumptions regarding carbon neutrality. The presentation enables consideration of the differing technical views. The EA now presents an estimate of all GHG emissions from operations under the proposed project (Table 3-3). For comparison, the discussion also presents an estimate of comparable GHG emissions without the project (the No-Action Alternative) (Table 3-4). Recognizing that there are different approaches and emission factors available that could lead to different results, whenever possible, the evaluation uses the same criteria or data source for comparable emissions for the "with and without" calculations. Information in the two tables is presented in enough detail that the reader should be able to follow and, as appropriate, duplicate the calculations. This approach also responds to commenters that stated they could not verify calculations in the Draft EA. In considering the information in the two tables, the following factors and assumptions are applicable:

- Current and future biomass usage at Nippon consists of roughly 50 percent forest biomass and 50 percent wood mill waste biomass (Nippon 2011); that is, under the proposed project, the additional 90,000 bone dry tons per year of biomass would consist of 45,000 tons of forest biomass and 45,000 tons of mill waste.

- Over the 10-year span from fiscal year 1999 through 2008 plus fiscal year 2010 (similar data were not reported for 2009), DNR reports that of the average 18,770 acres of annual timber-harvest in the west side of the state, an average of 812 acres involved pile and burn actions (DNR 2008, 2010d). It is assumed this 4.3 percent average is applicable to

the forested areas from which Nippon would obtain forest biomass. Therefore, of the 45,000 tons of added forested biomass targeted for the proposed project, it is assumed that 1,935 tons would be burned and 43,065 tons would be left in place to decompose if the project was not implemented.

- A heat or energy content of 8,000 Btu per pound (dry basis) is used for the woody biomass (Nippon 2011).

- Wastewater treatment sludge produced at the Nippon mill is estimated to equal about 5 percent of the woody biomass processed at the plant. Because it is basically cellulose in nature, it is assumed to have a similar energy content to the woody biomass, with similar GHG emission factors.

- The GHG emissions presented in the SEPA EIS were based on the proposed new boiler using 3,700 barrels (at 42 gallons per barrel) of #2 (low-sulfur) fuel oil per year compared with the current Boiler 8 usage of 15,295 barrels of #6 fuel oil per year. These same values were used in the evaluation in this EA.

Table 3-3. Estimate of GHG Emissions from the Proposed Project (for comparison with baseline GHG emissions, without the proposed project, in Table 3-4)

Action and Amount of Material Involved per Year	Gas	Emission Factor	Emission (tons)	GWP	Emissions in CO_2e (ton)	
					By Species	Subtotal
Combustion in New Boiler – Woody Materials						
170,000 bdt @ 8,000 Btu/lb =2,720,000 MMBtu	CO_2	195 lb/MMBtu[a]	265,200	1	265,200	
	CH_4	0.021 lb/MMBtu[a]	28.56	21	600	
	N_2O	0.013 lb/MMBtu[a]	17.68	310	5,481	271,281
Combustion in New Boiler – Wastewater Treatment Sludge						
9,000 bdt @8,000 Btu/lb =144,000 MMBtu	CO_2	195 lb/MMBtu[a]	14,040	1	14,040	
	CH_4	0.021 lb/MMBtu[a]	1.51	21	32	
	N_2O	0.013 lb/MMBtu[a]	0.94	310	291	14,363
Combustion in New Boiler - #2 Fuel Oil						
3,700 barrels or 155,400 gal @138,500 Btu/gal =21,523 MMBtu	CO_2	10.15 kg/gal[b] or 22.38 lb/gal	1,739	1	1,739	
	CH_4	3 g/MMBtu[b] or 0.00661 lb/MMBtu	0.071	21	1	
	N_2O	0.6 g/MMBtu[b] or 0.00132 lb/MMBtu	0.014	310	4	1,744
Biomass Processing – Gathering, Chipping, Transporting						
170,000 bdt (conservatively includes mill waste)	CO_2	0.03 m-ton/bdt[c] or 0.033 ton/bdt	5,610	1	5,610	
	CH_4	0	0	21	0	
	N_2O	0	0	310	0	5,610
Total						292,998

bdt = bone dry tons.
Btu = British thermal unit.
CH_4 = methane.
CO_2 = carbon dioxide.
CO_2e = carbon dioxide equivalent, equal to the gas emission multiplied by the GWP value.
g = gram.
gal = gallon
GWP = global warming potential.
lb = pound.
MMBtu = thousand, thousand (or million) British thermal units.
m-ton = metric ton (that is, 1,000 kilograms or 2,204.6 pounds).
N_2O = nitrous oxide.
a. Source: EPA 2003.
b. Source: DOE 2011a.
c. Source: SEI 2010.

Table 3-4. Estimate of Comparable GHG Emissions Without the Proposed Project

Action and Amount of Material Involved per Year	Gas	Emission Factor	Emission (tons)	GWP	Emissions in CO_2e (ton) By Species	Emissions in CO_2e (ton) Subtotal
Combustion in Existing Boiler 8 – Woody Materials						
80,000 bdt @ 8,000 Btu/lb =1,280,000 MMBtu	CO_2	195 lb/MMBtu[a]	124,800	1	124,800	
	CH_4	0.021 lb/MMBtu[a]	13.44	21	282	
	N_2O	0.013 lb/MMBtu[a]	8.32	310	2,579	127,661
Combustion in Existing Boiler 8 – Wastewater Treatment Sludge						
4,000 bdt @8,000 Btu/lb =64,000 MMBtu	CO_2	195 lb/MMBtu[a]	6,240	1	6,240	
	CH_4	0.021 lb/MMBtu[a]	0.67	21	14	
	N_2O	0.013 lb/MMBtu[a]	0.416	310	129	6,383
Combustion in Existing Boiler 8 – #6 Fuel Oil						
15,295 barrels or 642,390 gal @152,000 Btu/gal =97,643 MMBtu	CO_2	11.80 kg/gal[b] or 26.01 lb/gal	8,354	1	8,354	
	CH_4	3 g/MMBtu[b] or 0.00661 lb/MMBtu	0.323	21	7	
	N_2O	0.6 g/MMBtu[b] or 0.00132 lb/MMBtu	0.064	310	20	8,381
Biomass Processing – Gathering, Chipping, Transporting						
80,000 bdt (conservatively includes mill waste)	CO_2	0.03 metric ton/bdt[c] or 0.033 ton/bdt	2,640	1	2,640	
	CH_4	0	0	21	0	
	N_2O	0	0	310	0	2,640
Electricity Produced Elsewhere						
Average of 18.5 MW over 355 operating days per year = 157,620 MW-hr	CO_2	1,279.58 lb/MW-hr[d]	100,843	1	100,843	
	CH_4	0.04331 lb/MW-hr[d]	3.41	21	72	
	N_2O	0.01575 lb/MW-hr[d]	1.24	310	384	101,299
Forest Biomass Not Utilized and Burned in Place						
1,935 bdt (estimated at 4.3 percent of the forest residues)	CO_2	1.75 m-ton CO_2e/bdt[c] or 1.93 ton CO_2e/bdt			3,735	
	CH_4	0.03 m-ton CO_2e/bdt[c] or 0.033 ton CO_2e/bdt			64	
	N_2O	0.06 m-ton CO_2e/bdt[c] or 0.066 ton CO_2e/bdt			128	3,927
Forest Biomass Not Utilized and Allowed to Decompose in Place (occurring over 100 years)						
43,065 bdt (45,000 bdt less that burned in place)	CO_2	1.58 m-ton CO_2e/bdt[c] or 1.74 ton CO_2e/bdt			76,734	
	CH_4	0			0	
	N_2O	0			0	74,933
Mill Waste Biomass Not Utilized and Allowed to Decompose in Place or in a Landfill (occurring over 100 years)						
45,000 bdt	CO_2	1.58 m-ton CO_2e/bdt[c] or 1.74 ton CO_2e/bdt			78,300	
	CH_4	0			0	
	N_2O	0			0	78,300
Total						403,524

bdt = bone dry tons.
Btu = British thermal unit.
CH_4 = methane.
CO_2 = carbon dioxide.
CO_2e = carbon dioxide equivalent, equal to the gas emission multiplied by the GWP value.
g = gram.
gal = gallon.
GWP = global warming potential.
lb = pound.
MMBtu = thousand, thousand (or million) British thermal units.
m-ton = metric ton (that is, 1,000 kilograms or 2,204.6 pounds).
MW = megawatts.
MW-hr = megawatt-hours.
N_2O = nitrous oxide.
a. Source: EPA 2003.
b. Source: DOE 2011a.
c. Source: SEI 2010.
d. Source: EPA 2010c.

As can be seen in Tables 3-3 and 3-4, it estimated that the proposed project would potentially reduce GHG emissions by about 110,000 tons per year compared with existing operations with Boiler 8. The difference between the two totals can be attributed almost entirely to the electricity production that would be eliminated from elsewhere on the grid. In both scenarios, the woody biomass is either combusted or allowed to decay so there are no great differences in the GHG that would be emitted from the biomass. This analysis highlights why proponents of energy recovery from biomass favor the initiative and believe combustion of biomass to be carbon neutral.

However, the last two highlighted subtotals near the bottom of Table 3-4 may be interpreted as supporting the opposing viewpoint regarding carbon neutrality. The source of information for the emission factors for decaying wood mass recognizes that the emissions at the indicated levels would take about 100 years to occur. So it can be argued that including those numbers is misleading since the other values in the table would occur on an annual basis. Those two subtotals account for about 153,000 tons of GHG. If they were removed from the table, the proposed project would be shown as representing, at least in the short-term, an increase of about 43,000 tons of GHG per year.

Another factor in Table 3-4 worthy of discussion is the GHG value attributed to the electricity production. The emission factors used in the table are those recommended by EPA in its eGrid program for evaluating reduction of electricity usage in the subregion designated the Northwest Power Pool, which, excluding California, basically covers the continental United States west of Colorado and north of Arizona. It can be argued that values more representative of the project site would be more appropriate. For example, the Bonneville Power Administration provides electricity to the Port Angeles area, as well as being a primary provider in Washington and adjacent states, and reports that only 9.6 percent of its firm annual average electricity output comes from sources other than hydroelectric and nuclear (BPA 2010). If electricity that would be produced elsewhere uses only an average of 9.6 percent fossil fuel, then the associated GHG would be about 31,000 tons per year [(2.0562 pounds of carbon dioxide per kilowatt-hour) × (157,620 kilowatt-hour per year) × (0.096)], rather than the 101,299 tons shown in Table 3-4. Alternatively, if all electrical power generators were working together to reduce use of fossil fuel, it would be reasonable to assume that the proposed project would be totally offset by reductions in fossil fuel usage, which would represent about 324,000 tons of GHG per year. Considering these two extremes, the value in Table 3-4 could be reduced by about 70,000 tons per year or increased by more than 220,000 tons per year. In view of the wide range of these results, which add complexity to the ongoing debate with regard to GHG calculation methods, DOE used an EPA-recommended approach for the value shown in Table 3-4.

Note that the preceding discussion of GHG emissions associated with the proposed project does not include GHG emissions from construction, including vehicles and equipment that would be used. Construction emissions would occur only during a short period of time before operations and would be small in absolute terms and in comparison with emissions from producing 20 megawatts of electricity with biomass instead of fossil fuel or from producing the 50 megawatts of electricity for normal mill operations.

The release of anthropogenic GHGs and their potential contribution to global warming are inherently cumulative phenomena. Under the premise that the longer-term decay of biomass

should not be included in the evaluation, the proposed project would result in a worse-case net increase in GHG emissions of about 43,000 tons per year. For perspective, this increase would be relatively small compared with the 8,026 million tons of carbon dioxide equivalent GHGs emitted in the United States in 2007 (EIA 2007) and the 54 billion tons of carbon dioxide equivalent anthropogenic GHGs emitted globally in 2004 (IPCC 2007). However, emissions from the proposed project, in combination with past and future emissions from all other sources, would contribute incrementally to the climate change impacts described above. At present there is no methodology that would allow DOE to estimate the specific impacts (if any) this increment of climate change would produce in the vicinity of the facility or elsewhere.

3.1.2.2 Cultural Resources

The SEPA EIS (Port Angeles 2010a, pp 27-32) provides an extensive description of the cultural resources associated with the proposed project site and is incorporated by reference and summarized below. Much of the background information presented below comes from the SEPA EIS.

The proposed project site, at the base of Ediz Hook (Figure 2-1), is part of a paper mill that has been in continuous operation since 1920. The location on the north edge of the Olympic Peninsula, on the Strait of Juan de Fuca, and adjacent to a natural harbor made the site attractive for development by industries relying on water transport of raw materials and products. The forests of the Peninsula provided a vast resource of raw material for a paper mill. These characteristics and the native wildlife associated with the forests, streams, and ocean also made the site an attractive location for aboriginal people in the region. Archaeological sites dating back several thousand years may be present on Ediz Hook.

There is evidence that native residents along the Strait of Juan de Fuca were included in social and economic networks that extended to the areas of Vancouver Island, the Gulf of Georgia, and the lower Fraser River. The area of the proposed project is the historical territory of the Klallam Central Coast Salish people. There were a number of Klallam villages on the south shore of the Strait of Juan de Fuca, including Tse-whit-zen and Y'innis along Port Angeles harbor. Tse-whit-zen is located within a couple of hundred yards of the project site, and Y'innis is located at the east end of the harbor. The villages were typically inhabited through the winter months and provided access to salmon, sea mammals, and other marine resources.

Klallam people first encountered Europeans as explorers in the late 18th century and, in the early 19th century, at fur trading posts of the Hudson Bay Company. By the time Washington became a United States territory in 1853, Euro-American settlers had begun arriving on the Olympic Peninsula with an accompanying demand to open more traditional native territory to non-native settlement.

In 1855, Governor Isaac Stevens of the Washington Territory negotiated the Treaty of Point No Point with the Klallam and Skokomish Indians, under which the Tribes ceded title to the United States of their aboriginal territories, including all the lands along the south shore of the Strait of Juan de Fuca from roughly the Hoko River eastward, an area that includes all of Port Angeles Harbor. Klallam Indians were expected to move to the Skokomish Reservation at the south of Hood Canal, but generally believing they had been promised a reservation in their homeland,

most Klallams refused to relocate and remained in their traditional territories. Some obtained title to parcels of land through purchase or homesteading, and others remained in the area without obtaining any title under the law of the non-Indian settlers.

Over time, the Klallam Indians formed themselves into three distinct groups that became three distinct, Federally recognized tribes that exist today: the Lower Elwha Klallam Tribe, the Jamestown S'Klallam Tribe, and the Port Gamble S'Klallam Tribe. Jamestown began to form in 1874 when its members, consisting of Klallam Indians associated with the Dungeness and Discovery Bay area, to the east of Port Angeles, pooled their resources and acquired lands in the vicinity of the present-day Jamestown Reservation at Blyn, Washington. Lower Elwha consists of Klallam Indians from Port Angeles Harbor and the villages farther west. The Lower Elwha Reservation is located at the mouth of the Elwha River, where it enters the Strait of Juan du Fuca, several miles west of Port Angeles. The Lower Elwha Klallam Tribe includes members who are descended from those Klallams who continued to live on Ediz Hook on into the 1930s, and some Lower Elwha members were actually born on Ediz Hook (Mapes 2009).

By 1856, founders of an early fishing and trading company had staked claims in Port Angeles. These were joined by investors who claimed shorefront property and soon established a town site and started selling lots. Timber operations with small logging railroads were established throughout the Olympic Peninsula during the late 1800s and early 1900s, including a railroad that extended onto Ediz Hook. A major railroad was completed in 1912, which connected Port Angeles with other communities in western Washington and beyond. Construction of the Washington Pulp and Paper Company Mill began at the base of Ediz Hook in 1917. Historical photos of Port Angeles in the early 20th century show American Indian people still using the beach, which is crowded with their carved canoes and tents (Mapes 2009). Others, called "spit Indians," continued to live on Ediz Hook. A November 5, 1940, article in the *Crown-Z News* that documented the twentieth anniversary of the mill, reported that: "Fifteen squatter families were shooed away and hundreds of Indian bones disturbed just twenty years ago last spring when ground was broken and excavations made for foundations for the Washington Pulp & Paper Corporation's newsprint mill on the base of Ediz Hook Spit" (Mapes 2009).

In a series of articles covering the story of Tse-whit-zen, discussed below, the *Seattle Times* described information reported in 1920 when the Washington Pulp and Paper Corporation excavated footings for the nearby paper mill. The article indicated that a local paper of the time reported "hundreds of Indian bones were disturbed when the ground was broken" (Seattle Times 2005).

The mill was subsequently purchased by Crown-Zellerbach; it later became the Daishowa America Port Angeles Mill and is now owned by Nippon.

The shoreline and the lagoon immediately to the southwest of the mill site have been altered over time as the mill expanded. Material dredged from the lagoon was used to fill lagoon margins. Additional dredging and construction was done to accommodate the railroad and road bridges access to Ediz Hook.

Tse-whit-zen

Tse-whit-zen is an aboriginal Klallam village and cemetery that was unearthed in 2003–2004 on land just to the southeast of the Nippon paper mill. Village and human burial remains were encountered when the Washington Department of Transportation began constructing a dry dock on Port Angeles Harbor. Tse-whit-zen represents the largest aboriginal village ever unearthed in Washington, and evidence indicates the site dates back at least 2,700 years (Seattle Times 2005). When excavation for the dry dock began turning up artifacts and human remains, the project transitioned to an archaeological dig and eventually a cultural recovery and re-interment project involving the Lower Elwha Klallam Tribe. Over the course of about 16 months, thousands of artifacts were found along with approximately 335 intact human skeletons (as well as numerous isolated bones), indicating that this was a cemetery as well as a village. By November 2004, the tribal government of the Lower Elwha Klallam Tribe, after consulting with knowledgeable elders and spiritual advisors, called for an end to excavation activities and for abandonment of the dry dock project. The Tribe filed litigation against a variety of State and local parties. The State agreed to stop the project and the litigation was settled in a pair of August 2006 Settlement Agreements. Among other provisions, the Lower Elwha Klallam Tribe acquired title to a parcel of land at the Tse-whit-zen site where all human remains were re-interred in 2008. The Settlement also provides that the Lower Elwha Klallam Tribe is the owner of all the artifacts recovered from the site.

Added Information from Comments on the Draft EA

The Tribal Archaeologist for the Lower Elwha Klallam Tribe provided additional cultural resources information after review of the Draft EA (letter of March 30, 2011, see Appendix B). Archaeological investigations of the mill site in 1991 and 1992, in addition to ground-disturbing construction activities in 1992, confirmed the existence of a prehistoric occupation on Ediz Hook. These activities found a charcoal lens in the sidewalls of a construction area, a shell midden under a foundation slab, and several animal bones, including a whale vertebra, that suggested evidence of archaeological material.

Recent Investigations of the Project Site

The SEPA EIS provides discussion of additional archaeological, historical, and ethnographic studies performed in recent years in the area of the paper mill. The discussion includes results from a 2010 action taken by Nippon to conduct a geoarchaeological study and cultural resource assessment in support of the proposed project. The study identified the lagoon, tidal channel, intertidal zone, and beach as landforms within the project vicinity that may have been used by American Indians in the past. Nineteen geoprobes were placed around the project area, concentrating in the eastern section where most of the excavation would occur. The geoprobes were driven (and cores collected) to depths of 30 feet below the surface or to refusal. Analysis of the cores indicated an average depth of 6.5 feet of fill material over the site with native soil or earth underneath. Evaluation of the cores also indicated the potential for redeposited archaeological resources, including disturbed midden (waste pile materials), in portions of the study area. Four additional geotechnical borings, completed later in 2010 to depths of between 30 and 100 feet, provided similar findings.

Direct and Indirect Impacts

The proposed project would involve excavation, demolition of existing buildings, and construction of new facilities in an area that has already been disturbed and covered by pavement

and buildings. In most instances, this type of activity would involve little potential for adverse impacts to cultural resources, unless the buildings proposed for demolition were of historic significance. In this case, however, there is a reasonable potential that excavation into the materials under the pavement and existing buildings could encounter artifacts and possibly even remains of aboriginal people that lived in the area. Nippon's own evaluation of the underlying material indicates the fill brought in from other locations could include archaeological resources from those other locations. In addition, proximity to the culturally and archaeologically significant Tse-whit-zen site, along with historical reports of items encountered during the paper mill's initial construction, indicate the possibility of resources being encountered in the native soil that underlies the fill. Thus construction of the proposed project could involve encountering items that not only could be archaeologically significant, but which could be of traditional religious or cultural importance to the Klallam people.

As a result of the potential for adverse effects to cultural resources, DOE entered into formal consultations under Section 106 of the NHPA. Parties to this consultation include the Lower Elwha Klallam Tribe and the SHPO. DOE sent letters to six other tribes in the region (Section 1.4.2.2) to initiate formal consultation under Section 106 as well. Only the Makah Tribe responded, and the Makah Tribal Historic Preservation Office deferred participation to the Lower Elwha Klallam Tribe and the Jamestown S'Klallam Tribe, should the latter choose to participate. None of the five remaining tribes responded to indicate whether they had an interest in participating. DOE mailed copies of the Draft EA to all of the tribes at the beginning of the public comment period; the Lower Elwha Klallam Tribe remains the only tribe participating in the consultation.

In order to mitigate potential adverse effects, an MOA under Section 106 was developed among the SHPO, DOE, Nippon, and the Lower Elwha Klallam Tribe. In a letter of January 11, 2011, the DAHP, on behalf of the SHPO, concurred with DOE's analysis regarding the potential for the proposed project to have adverse effects on cultural resources and the need for an MOA under Section 106 (see Appendix B of this EA).

The MOA is the legal document, signed by each of the participating parties, that would provide the framework for undertaking the proposed project in a manner that is protective of archaeological and cultural resources should DOE authorize the use of Federal funding. The detail of how the action would be undertaken is then presented in the ARMP, which is an attachment to the MOA. The ARMP describes the elements of the proposed project that would require sub-surface construction excavation and summarizes the kinds of archaeological resources that may be present in the proposed belowground construction areas. It describes responsibilities, chain of command, and a stepped approach to identify, evaluate, and recover any significant archaeological deposits that may be in the project area. The ARMP includes procedures for pre-construction archaeological investigations, for archaeological construction monitoring, and for actions to be taken upon discovery of archaeological resources, including those actions to be taken should human remains be encountered.

As noted previously, the MOA was developed pursuant to requirements under Section 106 of the NHPA and its implementing regulations at 36 CFR Part 800, but in its development DOE also considered applicable requirements of Washington's Indian Graves and Records Act [Rev. Code Wash. (ARCW) 27.44 (2011)] and Archaeological Resource and Sites Act [Rev. Code Wash.

(ARCW) 27.53 (2011)]. The ARMP was developed to be consistent with the U.S. Secretary of the Interior's *Standards for Archaeological Documentation* (48 FR 44716, 44734-44737), the Advisory Council on Historic Preservation's Treatment of Archaeological Properties (Advisory Council on Historic Preservation, draft 1980), and applicable Washington State and Clallam County regulations.

With respect to other potential impacts associated with the proposed project, the two buildings that would be removed include one, the main office building, that was constructed in the 1930s and which has been associated with early mill operations. Nippon submitted the required historical and remodeling information and DAHP has provided its determination in a January 11, 2011 letter that neither building proposed for removal is eligible for the National Register. Accordingly, DOE believes construction of the proposed project would involve no potential for adverse impacts to cultural resources other than that identified for archaeological resources, including the potential for human remains, in the materials underlying the mill site. Similarly, once the proposed project has been constructed in accordance with terms of the MOA, operation of the new facilities would involve no adverse effects to cultural resources of the area beyond those that might be a result of current mill operations.

When the cogeneration facilities are eventually decommissioned, there would likely be limited excavation to remove foundations. However, such excavation would occur in areas that were subject to the MOA during initial disturbance under the proposed project and therefore any culturally significant items would have already been removed. Also, excavation that might be required during decommissioning would likely be to shallower depths. As a result, it is expected that decommissioning actions could be done with no further adverse effects to archaeological or cultural resources that might underlie the paper mill.

3.1.2.3 Water Resources – Surface Water

The City of Port Angeles is within the Elwha-Dungeness Watershed, which is designated Water Resource Inventory Area 18 by the State of Washington. This watershed is basically defined by the drainages of two large rivers: the Elwha River along the western boundary of the watershed and the Dungeness River along the eastern boundary. The Elwha River and its proximity to Port Angeles and Ediz Hook can be seen in Figure 2-1. The Dungeness River is not shown on the figure because it is located further east, approximately 15 miles from paper mill, where it drains into Dungeness Bay. Also shown in Figure 2-1 are several smaller streams that drain into the Strait of Juan de Fuca. Because the site of the proposed project is on a sand spit (Ediz Hook) that juts out into the Strait, it is not directly affected by, nor would it affect any of these rivers or streams. Rather the surface waters of primary significance to the project site are the lagoon and harbor on the south side of Ediz Hook and the Strait to the north.

Nippon has two discharge points or outfalls that are permitted under NPDES. Both outfalls discharge into the Strait of Juan de Fuca. Outfall 001 extends about 1,000 feet into the Strait and carries effluent from the mill's industrial wastewater treatment plant; no sanitary wastewater is involved, only waste process water from the mill's operations go to the onsite treatment plant. The permit for Outfall 001 requires Nippon to routinely monitor and meet permit limits for numerous parameters including flow, biological oxygen demand, total suspended solids, pH, oil and grease, and other typical wastewater pollutants. Outfall 002 is at the shoreline of the Strait

and has permit limits only for flow because it is nothing more than fresh water used to backwash a sediment filter. The filter plant involved receives water diverted from the Elwha River and provides filtration to remove any sediment before the water is used in mill processes. The filter must be backwashed periodically to maintain its efficiency and that backwash goes to Outfall 002 (Smith 2011d).

The paper mill's use of water diverted from the Elwha River provides an indirect link to that surface water, which is described in some detail in the SEPA EIS (Port Angeles 2010a, pp 17-20). Much of the same information can be found in the NPS EIS (described in Section 1.1 of this EA) on the Elwha River Ecosystem Restoration Project (NPS 2005). The applicable information in the SEPA EIS and the NPS EIS is incorporated by reference here and some of the more significant information is summarized in the following statements.

- There are two manmade lakes on the Elwha River: the lower, Lake Aldwell (impounded by Elwha Dam) and the upper, Lake Mills (impounded by the Glines Canyon Dam). The dams were originally installed as hydroelectric generation facilities and, with some exceptions in the upper dam (Lake Mills), are now operated as "run-of-the-river" generators, allowing peak and low flows to directly pass the dam. Both dams and the lakes are to be eliminated under the National Park Service's dam removal project now underway.

- The U.S. Geological Survey has collected flow data at its McDonald Bridge monitoring station on the Elwha River from 1897 to the present. [This monitoring station is located between Lake Aldwell and Lake Mills, about 1 mile above the head (inflow) of Lake Aldwell.] The river is characterized as having a current mean annual flow of 1,508 cubic feet per second, or 973 million gallons per day with historical average monthly flows ranging from 600 to 2,200 cubic feet per second (387 to 1,422 million gallons per day). Lowest flows typically occur in the August-September timeframe and the double peaks of maximum flow typically occur in the months of June and December. [Annual average flow at the mouth of the Elwha River is approximately 1,650 cubic feet per second, about 10 percent higher than the annual average at the McDonald Bridge monitoring station (NPS 2005).]

- The City of Port Angeles has had a long-term permit for the use of 150 cubic feet per second (97 million gallons per day) as a continuous diversion from the Elwha River. In addition to historically supplying pulp and paper mills with this water, 50 cubic feet per second of the allotment has been designated for fish rearing, first going to the State's Department of Fish and Wildlife's Elwha Rearing Channel and more recently with a portion of the 50 cubic feet per second (32 million gallons per day) going to the Lower Elwha Klallam Tribe's fish hatchery.

- The City's diversion point is about 3.5 miles (as the river flows) from the mouth of the Elwha River. A new diversion intake was recently constructed in anticipation of the dam removal project and has a design capacity of about 180 cubic feet per second (116 million gallons per day). In addition to the users already receiving industrial water from this source, the City intends it to be a back-up source to the municipal water supply.

- In 1990, Nippon (or Daishowa America as it was previously known) entered into a 30-year Water Supply Contract with the City of Port Angeles for untreated water from the Elwha River not to exceed 20 million gallons per day. The water is to be delivered via the Elwha River Water Extension Project pipeline owned by the City. The current contract puts responsibility for maintenance of the industrial waterline on the City, but Nippon is to reimburse costs for maintenance on the portion of the waterline from the Nippon mill upstream to the Elwha River diversion.

- Nippon has informed the City that its average water use under the Water Supply Contract is 8 to 9 million gallons per day, but that short-term peaks sometimes exceed 12 million gallons per day.

As part of the Federal action to remove the two Elwha River dams, the National Marine Fisheries Service, along with several cooperating agencies and groups, developed a scientific framework for restoring the River's ecosystem and fisheries, which is documented in the Elwha River Fish Restoration Plan (Ward et al. 2008). This Plan provides additional detail on River flow and its significance in restoring and maintaining habitat for the re-establishment of fisheries. The National Marine Fisheries Service reports that although the average flow of the River may be 1,500 cubic feet per second, base flows during summer may be as low as 200 cubic feet per second. The Service further reports that water rights issued by the State on this flow total 212 cubic feet per second (with the largest belonging to Port Angeles) and pose a risk to the River's fisheries resources. The Water Resources Inventory Area 18 Watershed Plan (for the Elwha-Dungeness Planning Unit) (Clallam County 2005) recommends that no additional water rights be issued for the Elwha watershed until the dam removal is complete and the River channel stabilizes, at which time evaluations can be performed to establish minimum instream flow under the River's restored condition. The Service estimates it will take up to 10 years for the River to stabilize after the dams are removed (Ward et al. 2008). The Watershed Plan recommends that, once the River is stabilized, the City of Port Angeles (as the largest water user in the watershed) complete a water conservation strategy for low flow periods that incorporates the needs of fish as the primary trigger. This Watershed Plan has been endorsed by all of the initiating governments that were party to the Plan: Clallam County, City of Port Angeles, Lower Elwha Klallam Tribe, Jamestown Klallam Tribe, Agnew Irrigation District, and the Washington Department of Ecology.

In addition, the Lower Elwha Klallam Tribe has an unadjudicated claim under the Treaty of Point No Point to Federal reserved water rights in the Elwha River sufficient to support restoration of the anadromous fishery and related habitat, including a quantity of water sufficient to meet the needs of the Tribe's fish hatchery. The Lower Elwha Reservation is located at the mouth of the Elwha River where it enters the Strait of Juan de Fuca. The Tribe has operated a hatchery on its Reservation for a number of years, which will be rendered unusable by the higher water table that will result from removal of the Elwha River dams beginning in September 2011. Pursuant to the *Elwha River Ecosystem and Fisheries Restoration Act* (Pub.L. 102-495) and in collaboration with NPS, the Tribe in May 2011 completed construction of a new hatchery, also within the Reservation. Under a 2004 Memorandum of Understanding among the Tribe, NPS, and the City of Port Angeles, the City will deliver 30 cubic feet per second of River water to the Tribe's new hatchery through the City's new diversion intake.

Drinking water and sanitary sewer service for the paper mill are provided by the City of Port Angeles and are, therefore, considered utilities, which are addressed in Section 3.1.2.12.

Wetlands

Figure 3-1 provides a map of wetlands within the general project area. The map was generated by a "Wetlands Online Mapper" tool available on the U.S. Fish and Wildlife's National Wetlands Inventory Website (http://www.fws.gov/wetlands/Data/Mapper.html). Figure 3-1 shows four distinct wetlands areas of four different types, three of which are in proximity to the Nippon paper mill.

The codes shown in the figure (for example, PUBKHx) provide information, in addition to the legend, on the types of wetlands represented by the different shadings. For purposes of this analysis, these codes can be simplified as follows:

1. Freshwater Pond – PUBKHx – Palustrine (inland without flowing water) wetlands with an unconsolidated bottom; that is artificially, though permanently flooded; and formed by excavation.

2. Estuarine and Marine – E1UBLx – Estuarine (in the transition zone between river and ocean environment) wetlands; in a subtidal (always below water), saltwater regime; with an unconsolidated bottom; and formed by excavation.

3. Estuarine and Marine – M1UBL – Marine wetlands, in a subtidal, saltwater regime; and an unconsolidated bottom.

4. Freshwater Pond – PFO1A – Palustrine wetlands pond; in a broad-leaved, deciduous forested area; and that is temporarily flooded.

Per the wetlands characterization information, both the pond and the lagoon immediately to the southwest of the primary mill facilities are man-made (excavated) features.

Floodplains

Due to its location within Washington's coastal zone and adjacent to a harbor on one side and the Strait of Juan de Fuca on the other, much of the Nippon paper mill and the proposed project site are within zones of potential flooding. FEMA produces Flood Insurance Rate Maps that cover most of the United States and identify areas that might be prone to flooding. Specifically, FEMA's maps generally show the extent of flood waters for a 100-year flood, which is identified as base flood; a flood that has a 1 percent chance of being equaled or exceeded in any given year. A flood of this magnitude, or greater, would be expected to occur once (on average) within any 100-year period.

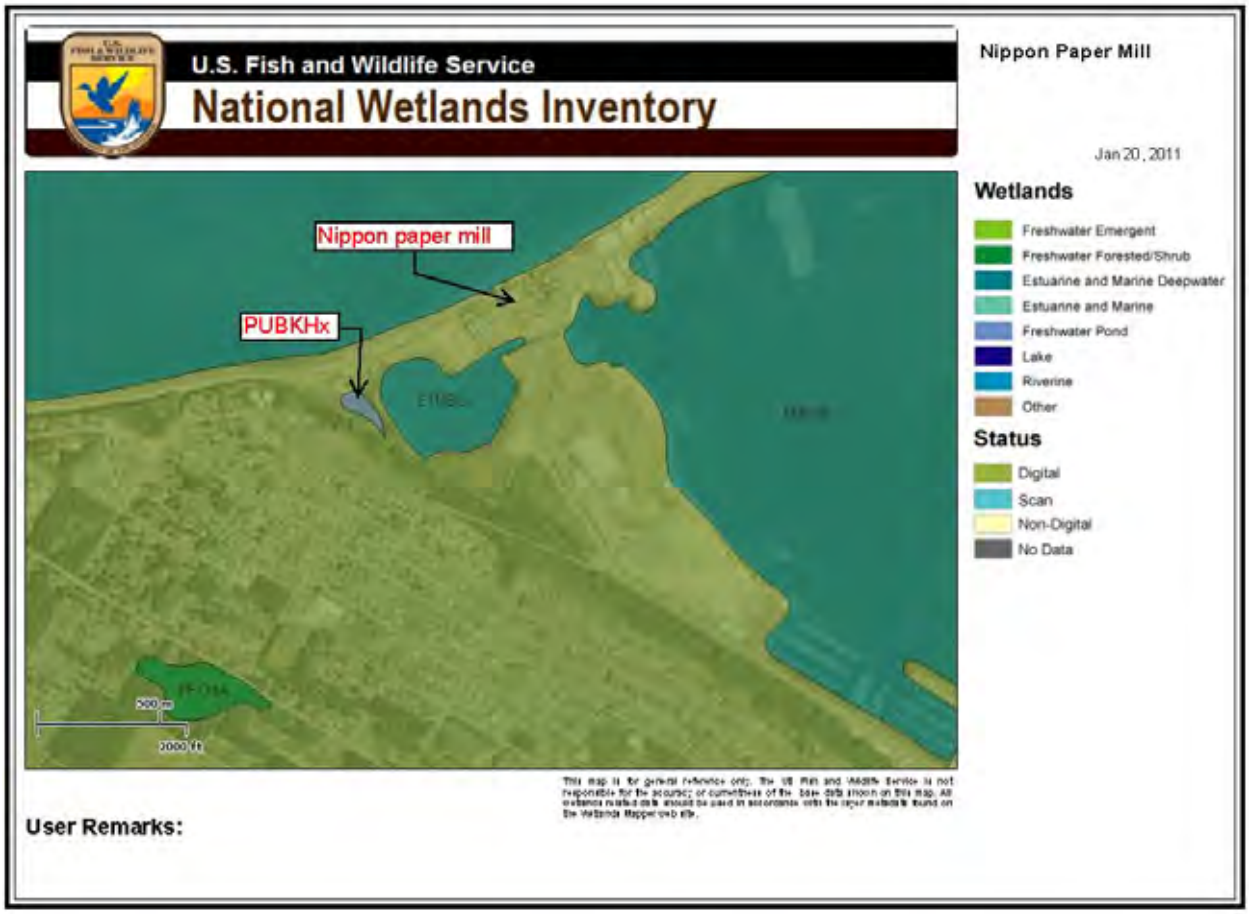
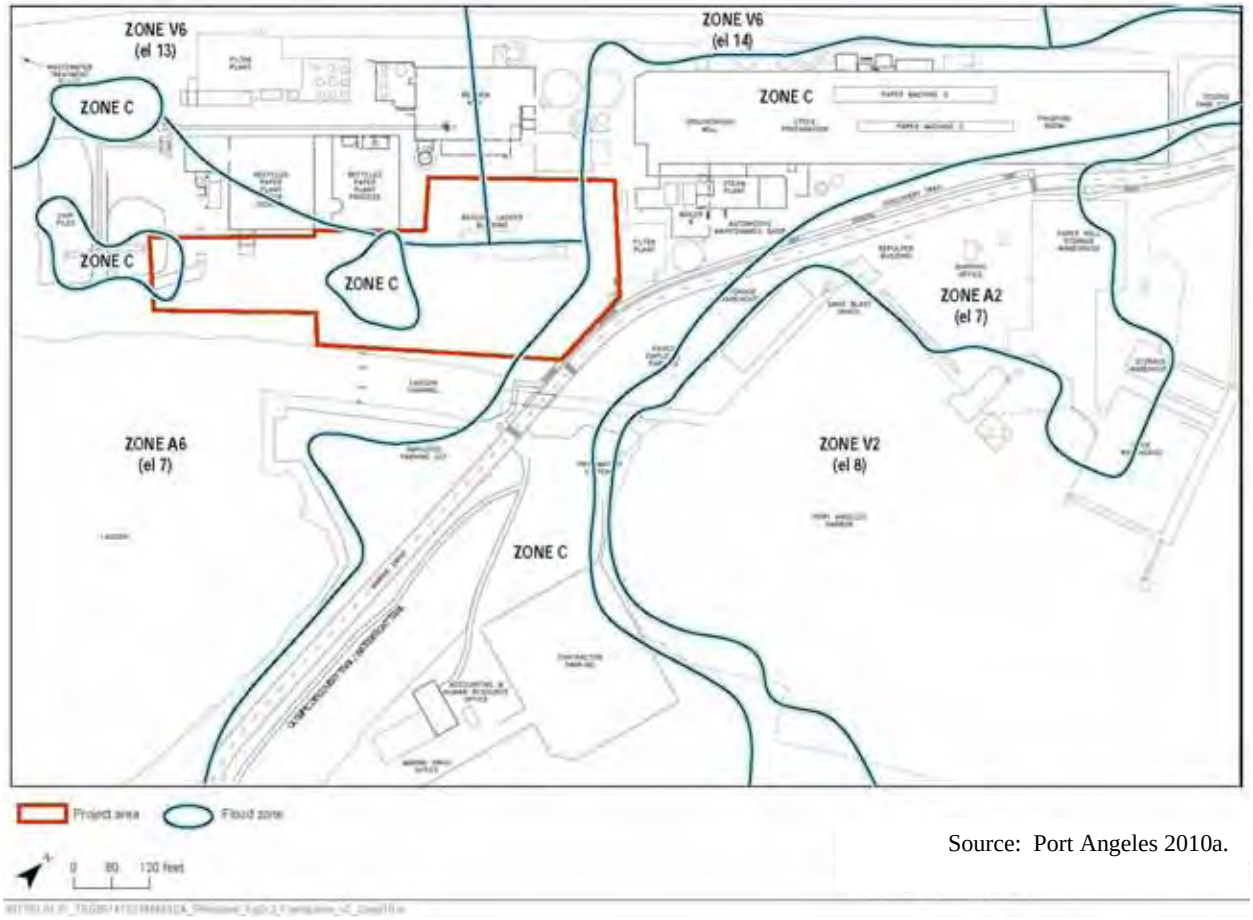


Figure 3-1. Wetlands (from the National Wetlands Inventory) Within the General Project Area

Figure 3-2 is a map of the flood zones in the area of the proposed project site. This figure was taken from the SEPA EIS, but it was derived from a 1990 Flood Insurance Rate Map (FEMA 1990) published by FEMA, which can be found online at (http://www.fema.gov/hazard/map/index.shtm). In the figure, those areas designated Zone C are outside of the 100-year flood zone. Those areas designated with either a Zone A or Zone V are within the 100-year flood zone; the Zone V areas have the hazard of being subject to wave action velocity in addition to inundation. In both cases, the elevation (el) numbers included in parentheses with the zone designations are the calculated elevations of the 100-year flood. Additional information on the zone designations is provided in the SEPA EIS (Port Angeles 2010a, pp 20-22) and is incorporated here by reference.

In Figure 3-2, the Zone C area about in the middle of the red outlined project area is about where the biomass piles are currently located. It can be seen that much of the area where new facilities would be located are with 100-year flood zones and a small portion of the northern project area could also be subject to wave action.



Source: Port Angeles 2010a.

Figure 3-2. Flood Zones or Floodplains in the Area of the Proposed Project

Direct and Indirect Impacts

As described in the SEPA EIS, storm water runoff during construction would be controlled and monitored to meet terms of the Washington State Construction Stormwater Permit (if required) and the mill's NPDES permit, which includes storm water collection and treatment. Water needs for construction activities such as fill compaction and dust suppression would be met with Nippon's industrial water supply and the quantities needed would be well within the projected increased demand during operations.

During operations, Nippon estimates that the new facilities could require up to 1.2 million gallons per day over current industrial water demand. With this highest estimated amount attributed to the proposed project, it would put the mill's normal use of industrial water at 9.2 to 10.2 million gallons per day, with short-term peaks of about 13.2 million gallons per day. This additional water demand would be solely for cooling purposes, and so is dependent on the final specifications of the equipment that would be obtained. As described in Section 2.2.2, the added demand, as supported by recent refinements in the project design, is about one-third of what was evaluated in the SEPA EIS. This water would come from the Water Supply Contract with the City of Port Angeles. As identified previously, this existing contract provides Nippon the use of up to 20 million gallons per day and the mill's current usage is in the 8 to 9 million-gallon-per-day range with short-term peaks up to 12 million gallons per day. Because the additional water

would be within the existing contract amount and represents no change in the place where the water would be used, the point of diversion, or the nature of the water use, no additional permit or approval would be required.

The additional water would be well within the carrying capacity of industrial pipeline since the City originally contracted the pipeline to supply 65 million gallons per day to two industrial users (including the 20 million gallons per day contracted to Nippon) and the second user is no longer in business. Similarly, the additional water would have a very minor effect on the amount diverted from the Elwha River. The 1.2 million gallons per day (or 1.8 cubic feet per second) represents 0.12 percent of the average flow in the Elwha River at a location some 3 miles upstream from the diversion point, so river flow at the diversion point would be expected to be greater as a result of side streams and other sources entering the river between the two points. The additional water demand also represents 0.9 percent of the River's lowest instantaneous flow, 0.3 percent of the River's average low flow and 0.08 percent of the average peak flow. The additional water demand of 1.2 million gallons per day is also only a small part of the 150 cubic feet per second, or 97 million gallons per day, that the City of Port Angeles is permitted to divert from the river.

In the short-term, the small additional demand from the Elwha River would not be expected to have any adverse effect on fisheries habitat beyond what would be caused by the dam removal. It will take up to 10 years after dam removal for River conditions to stabilize and during much of that time sediment loadings will be high enough that direct mortality of fish is expected to occur (Ward et al. 2008), and habitat will be in a state of flux as the heavy sediment loads (now behind the dams) move through the system. Riverbed aggradation of 1 to 4 feet is estimated for the lower portion of the river. The City of Port Angeles has concurred with a plan of action that, once the River has stabilized, would require it to evaluate water conservation measures in order to be protective of fish habitat during times of low flow in the Elwha River. To what extent such measures might affect the Nippon operations is unknown, but it is suspected that the added 1.2 million gallons per day associated with the proposed project would not be a controlling factor.

The demand for additional process water will result in a corresponding increase to the amount of water processed through Nippon's onsite industrial wastewater treatment plant and the Outfall 001 to which the treatment plant discharges. Nippon has indicated that the additional wastewater will have no adverse effect on the wastewater treatment plant's capacity. Also, since the additional water is expected to be no more than cooling water, it would not be expected to hinder the plant's treatment capability or the plant's ability to meet the discharge limits set in the NPDES permit that covers Outfall 001. This includes the temperature and flow requirements set in the permit, which should be the only parameters that would potentially be affected by the increased discharge. Since the permit limits for Outfall 001 were established by the Washington Department of Ecology to be protective of the marine environment, discharge changes associated with the proposed project, still within the permit limits, would not be expected to have an adverse effect. Alternatively, the cooling water could be discharged through the deep water diffuser currently under construction for Outfall 002. This discharge alternative would not be used without approval from the Department of Ecology.

Decommissioning of the cogeneration facilities would be very similar to construction in the type of activities that would be ongoing and the measures that would be taken to control and monitor

runoff. It is assumed that after facility decommissioning, the land area would remain as a covered, impermeable portion of the paper mill, with runoff subject to the mill's NPDES permit.

Wetlands Impacts

The proposed project would have no impact on wetlands. The wetlands identified in Figure 3-1 are all outside of the area where construction would be performed and there would be no dredging or filling of the wetlands as part of the project. Precipitation runoff during construction or operation of the proposed new facilities would be managed in accordance with the previously described general construction storm water permit or the mill's existing NPDES permit and no adverse impacts to the wetlands would be expected.

Floodplain Impacts

Primary elements of the proposed project, including the boiler and turbine buildings and the air pollution equipment, would be located within a 100-year flood zone (Figures 2-3 and 3-2). Depending on the final configuration of the biomass fuel storage, it is likely that at least portions of that building would also be in the 100-year flood zone. These buildings would be designed and constructed using normal building standards applicable to this type of location and would include measures to minimize the damages that could result from flooding. As noted in the SEPA EIS (Port Angeles 2010a, p 21), there are mandatory flood insurance purchase requirements associated with building in these areas. Possibly of greater importance from the standpoint of environmental impacts and compliance with requirements of Executive Order 11988, *Floodplain Management* and 10 CFR Part 1022, is the fact that the proposed project would not represent a change in the current use of the project area. This area is already developed for industrial use. The proposed project would not be expected to have any adverse impacts on the area's natural and beneficial floodplain values beyond those already attributed to the location's existing development. The added buildings would represent land area that would be blocked from the spread of flood waters. However, the nature of the flooding that would occur in this area (from the ocean) and expansive area involved means there would be no resulting increase in flood water elevation that could worsen impacts to other areas. There would be no added impacts to lives or property in the area because the project would not alter the areas that would be inundated by severe flooding or alter the depths of floodwaters. Indirect or long-term impacts are not anticipated.

Requirements for a floodplain assessment under 10 CFR Part 1022, which are being met by this section of the EA, direct DOE to consider alternatives to a proposed project that "avoid adverse impacts and incompatible development in the floodplain." In this case, it was not DOE's role to determine a location for the proposed project, and DOE is satisfied that Nippon did not have a reasonable alternative to the proposed location. In order to make efficient use of existing utility and process connections, the proposed project had to be located within the mill's built-up, developed footprint. Given the location of the mill on Ediz Hook, it is likely that any other potential project sites within the developed mill area, if any exist, would also be within a flood zone. Further, DOE believes the proposed project does not involve additional adverse impacts to the floodplain and is consistent with the development that has already occurred.

3.1.2.4 Biological Resources

The proposed project would occur within the developed, industrial-use footprint of an existing paper mill. Areas where construction would occur have already been disturbed and developed, and do not contain habitat of concern for any plant or animal species. Accordingly, this section does not provide a discussion of the biological resources in the area immediate to the Nippon paper mill. However, to verify compliance with the *Endangered Species Act of 1973*, as amended (16 U.S.C. 1531 *et seq*.), this section does address threatened and endangered species. This section also addresses, in general, forest areas from which biomass would be collected in support of the added feedstock demands of the proposed project.

Threatened and Endangered Species

Table 3-5 provides information on the status of threatened and endangered species and critical habitat in Clallam County, Washington, as identified on the U.S. Fish and Wildlife Service Washington Field Office Website. Table 3-6 identifies species listed by the State of Washington as endangered, threatened, sensitive, or candidate and which are expected to have habitat in Clallam County.

Forest Area Sources of Biomass

Much of the biomass currently used at the Nippon paper mill comes from the logging industry on the Olympic Peninsula. This would continue to be the case with the increased quantity of biomass that would be used under the proposed project. Nippon obtains the biomass from operators processing forest slash in the area and the locations where these operators obtain the biomass change over time in accordance with changes in the areas logged. As a result, the forest areas that would be affected by the proposed project, as well as the potential effects, can only be discussed in general terms.

An important element in the discussion of biomass resource is availability. The DNR is responsible for evaluating the availability of this resource. The DNR's Forest Biomass Initiative was started in 2009 to demonstrate the utility of forest biomass as a clean, renewable energy source. Washington State House Bill 2165 (Biomass Supply Bill), passed in 2009, authorized DNR to implement forest biomass-to-energy demonstration projects. After responding to a DNR Request of Letters of Interest, Nippon was one of four businesses or other entities selected to partner with the DNR as a biomass-to-energy pilot project (DNR 2010b). The DNR's Forest Biomass Initiative is a sub-element of the State's forestry and logging program, and the availability and sustainability of forest biomass can, of course, only result from the State's sustainable management of its forested lands.

Both Nippon and DNR are confident there are adequate biomass resources to accommodate the proposed project. Nippon has indicated its intent to continue obtaining biomass from a combination of public and private landowners. In its feasibility study for the proposed project, Nippon indicated that based on its experience, the amount of slash fuel available in the area is many times the total amount that would be required for the project. Further, as part of being selected as a pilot project under the Forest Biomass Initiative, DNR intends to enter into a long-term contract with Nippon for forest biomass from DNR-managed lands on the Olympic Peninsula. A criterion used in the selection of the pilot projects was DNR's certainty that the project would not require more forest biomass than was available in the area of the project (DNR

2010b). In late 2010, the DNR announced the undertaking of a statewide study to assess forest biomass availability and sustainability, which should be completed by August 2011. The Washington State Legislature is requiring that the study be completed before DNR enters into long-term agreements for biomass from DNR lands, with the exception of the pilot projects, including Nippon's project (DNR 2010b).

Table 3-5. Threatened and Endangered Species and Critical Habitat Status for Clallam County

Listed Species	
Bull trout	*Salvenlinus confluentus*
Marbled murrelet	*Brachyramphus marmoratus*
Northern spotted owl	*Strix occidentalis caurina*
Short-tailed albatross	*Phoebastria albatrus*
Designated	
Critical habitat for bull trout	
Critical habitat for the marbled murrelet	
Critical habitat for the northern spotted owl	
Proposed	
Dolly Varden	*Salvelinus malma*
Revised critical habitat for bull trout	
Candidate	
Fisher	*Martes pennanti*
(Olympic) Mazama pocket gopher	*Thomomys mazama ssp.melanops*
Species of Concern	
Bald eagle	*Haliaeetus leucocephalus*
Brown pelican	*Pelecanus occidentalis*
Cascades frog	*Rana cascadae*
Cassin's auklet	*Ptychoramphus aleuticus*
Long-eared myotis	*Myotis evotis*
Long-legged myotis	*Myotis volans*
Makah's copper	*Lycaena mariposa charlottensis*
Northern goshawk	*Accipiter gentilis*
Northern sea otter	*Enhydra lutris kenyoni*
Olive-sided flycatcher	*Contopus cooperi*
Oregon vesper sparrow	*Pooecetes gramineus affinis*
Pacific lamprey	*Lampetra tridentate*
Pacific Townsend's big-eared bat	*Corynorhinus townsendii townsendii*
Peregrine falcon	*Falco peregrinus*
Olympic torrent salamander	*Rhyacotriton olympicus*
River lamprey	*Lampetra ayresi*
Tailed frog	*Ascaphus truei*
Tufted puffin	*Fratercula cirrhata*
Valley silverspot	Speyeria zerene bremeri
Van Dyke's salamander	*Plethodon vandykei*
Western toad	*Bufo boreas*
Cotton's milk vetch	*Astragalus australis var. olympicus*
Tall bugbane	*Cimicifuga elata*

Source: USFWS 2010

Table 3-6. Species Listed by the State of Washington and Expected to Have Habitat in Clallam County

Fishes – Species (Status)		
River Lamprey (SC)	Steelhead (SC)	China Rockfish (SC)
Olympic Mudminnow (SS)	Sockeye Salmon (SC)	Copper Rockfish (SC)
Pacific Herring (SC)	Pacific Cod (SC)	Greenstriped Rockfish (SC)
Eulachon (SC)	Pacific Hake (SC)	Quillback Rockfish (SC)
Bull Trout (SC)	Walleye Pollock (SC)	Redstripe Rockfish (SC)
Chinook Salmon (SC)	Black Rockfish (SC)	Tiger Rockfish (SC)
Chum Salmon (SC)	Bocaccio Rockfish (SC)	Widow Rockfish (SC)
Coho (SC)	Brown Rockfish (SC)	Yelloweye Rockfish (SC)
Pygmy Whitefish (SS)	Canary Rockfish (SC)	Yellowtail Rockfish (SC)
Reptiles – Species (Status)		
Pacific Pond Turtle (SE)		
Amphibians – Species (Status)		
Van Dyke's Salamander (SC)	Western Toad (SC)	
Birds – Species (Status)		
Brandt's Cormorant (SC)	Tuffed Puffin (SC)	Yellow-billed Cuckoo (SC)
Brown Pelican (SE)	Western Grebe (SC)	Spotted Owl (SE)
Cassin's Auklet (SC)	Bald Eagle (SS)	Vaux's Swift (SC)
Common Murre (SC)	Golden Eagle (SC)	Pileated Woodpecker (SC)
Marbled Murrelet (ST)	Northern Goshawk (SC)	Oregon Vesper Sparrow (SC)
Short-tailed Albatross (SC)	Peregrine (SS)	Purple Martin (SC)
Mammals – Species (Status)		
Blue Whale (SE)	Pacific Harbor Porpoise (SC)	Olympic Marmot (SC)
Humpback Whale (SE)	Sea Otter (SE)	Western Pocket Gopher (ST)
Gray Whale (SS)	Steller Sea Lion (ST)	Fisher (SE)
Sperm Whale (SE)	Townsend's Big-eared Bat (SC)	
Orca (Killer Whale) (SE)	Keen's Myotis (SC)	
Invertebrates – Species (Status)		
Pinto (Northern) Abalone (SC)	Queen Charlotte's Copper (SC)	Valley Silverspot (SC)
Olympia Oyster (SC)	Puget Blue (SC)	Taylor's Checkerspot (SE)
Johnson's Hairstreak (SC)	Sand-verbena Moth (SC)	

Source: DFW 2008.
SE = State Endangered; ST = State Threatened; SS = State Sensitive; SC = State Candidate.

Direct and Indirect Impacts

The proposed project would take place at a site that has already been disturbed and covered with pavement and buildings. Construction activities would include demolition of facilities and excavation of pavement and underlying fill. These actions would not be expected to have impacts on any animal or plant species or habitat beyond the effects that have already occurred as a result of the paper mill's presence. Precipitation runoff from the construction area would be managed in accordance with Nippon's existing NPDES permit for storm water discharges and would have to meet existing limitations of that permit. Additional land area would be needed for staging of equipment and materials during construction. These would be only temporary needs and Nippon would use either existing paved areas within the mill site or would look for nearby property that could be leased for the purpose. No effects to terrestrial plant or animal species would be expected if on site locations were used; if off site locations were to be used, Nippon would survey the sites to ensure no sensitive species or habitat would be adversely affected.

Operation of the new boiler, turbine, and associated biomass handling facilities would not be expected to have any impacts on animal or plant species or habitat in the adjacent water bodies or land areas beyond those already experienced from routine operations of the paper mill. Air emissions would be slightly different than from current operations, but not to the extent that plant or animal species would be adversely affected. Discharges to the Strait through the mill's National Pollutant Discharge Elimination System permitted outfalls would also be slightly different in terms of volume and possibly temperature, but they would still be within the existing permit discharge limits, including for temperature. DOE has made a No Effect Determination pursuant to the *Endangered Species Act* for the proposed project, thereby concluding that there would be no impacts to threatened or endangered species or critical habitat. Similarly, no adverse impacts to other biological resources would be expected.

Activities during decommissioning of the cogeneration facilities would be expected to be similar to those during construction and would not be expected to have impacts on any animal or plant species or habitat beyond the effects that have already occurred as a result of the paper mill's presence.

The forest materials that would be used as biomass in the proposed project are materials left behind from logging operations that would typically be left in place or open burned. Opponents of the State's biomass initiative have indicated a concern that removing these materials negatively impacts the forest's ecosystem because such activity removes organic materials that are essential to forest health. DNR, as manager of the State's forests, recognizes this concern, but is also aware that too much material left on the forest floors can act to slow forest growth, be conducive to disease, or unnaturally increase severity of wildfires (DNR 2010c).

The DNR is actively collecting information and developing protocols that will allow it to consider forest biomass as another commodity of value in its efforts to sustainably manage forested State trust lands. One of the items targeted in the statewide forest biomass supply assessment described above is the "estimated volume, physical characteristics, and distribution of material, live and dead, under a reasonable range of onsite retention levels to protect soil productivity, water quality, fish and wildlife habitat, and other ecological functions" (DNR 2010b). This is a step to establish what biomass collection should look like (or what the site should look like after collection) in order to protect the ecosystem. In addition, Washington's Forest Practice Board has started a rulemaking process to include forest biomass removal in the Forest Practice Rule definition of "forest practice" (DNR 2010b). Once in place, this change in definition will mean that collection of forest biomass will require a Forest Practice Permit and compliance with the State's strict forest practice rules, which are in place to protect ecosystem health (DNR 2010c). DNR recognizes that this is a new and evolving program and in its report to the Washington State Legislature on this topic indicated "whether this rule change will be sufficient to ensure the ecosystem health is not negatively impacted by biomass harvest is an issue currently being discussed by the Washington's Forest Practice Board and will largely be determined by the forest practices Adaptive Management program" (DNR 2010b). That is, data will be collected and evaluated, and if the rule change is not sufficient to ensure ecosystem health, then additional measures will be pursued.

The DNR's efforts to establish biomass-related criteria for maintaining forest ecosystem health and mechanisms to regulate the collection of forest biomass are intended to minimize potential

impacts resulting from the State's Forest Biomass Initiative. Similarly, these measures should act to minimize impacts of the proposed project on local forests.

3.1.2.5 Aesthetics and Visual Resources

The Nippon paper mill, on Ediz Hook, is in the industrial, harbor area of Port Angeles and has continually operated at this location for about 90 years. The City's Comprehensive Plan identifies the harbor area as one of the preferred locations for new industrial activities coming into the City (Port Angeles 2010b). The appearance of the paper mill would likely be considered by most observers to be consistent with expectations for an industrial facility; there are numerous buildings, tanks, pieces of equipment, and raw material piles in a fairly dense configuration, and steam plumes are a normal feature. The mill site and the general harbor area do, however, offer some unique visual resources out to the Strait to the north and back to the snow-capped Olympics to the south. The SEPA EIS (Port Angeles 2010a, pp 26-27) provides some discussion on the recreational facilities in the immediate area that could be of particular value to many people in spite of the industrial setting.

The principal recreational feature described in the SEPA EIS is the Waterfront Trail, owned and maintained by the City, which runs 6.5 miles from the U.S. Coast Guard Air Station at the end of Ediz Hook, around the harbor, and eastward through downtown Port Angeles. At a point east of downtown, it connects to the Olympic Discovery Trail, which extends all the way to Port Townsend. The portion of the trail running through the Nippon mill is shown and labeled (Olympic Discovery Trail/Waterfront Trail) in Figure 2-3. The trail is used by pedestrians and bicyclists to access view points and beach areas on Ediz Hook and, as shown in Figure 2-3, runs immediately adjacent to mill facilities in places.

Other recreational opportunities described in the SEPA EIS include vehicle turnouts and picnic areas on Ediz Hook and opportunities for boating, kayaking, and fishing in the harbor and in the Strait of Juan de Fuca on the other side of Ediz Hook.

Direct and Indirect Impacts

It is expected that construction would result in additional noise, dust, and traffic compared to normal plant operations. Construction activities would not preclude use of the Waterfront Trail or other recreational uses of the area, but participants in those uses could find them less enjoyable. This would be subject to the individual's expectations and perceptions. Some people may find any differences due to construction to be only a minor increment over normal industrial operations and pay little attention to them. If a person already found the mill's presence objectionable, construction activities would likely be noticed and would further degrade the experience. Overall, DOE believes the construction activities would not be so different from what would be expected in an industrial area to pose unreasonable effects on the aesthetics and visual resources of the area.

Operation of the paper mill with the new facilities would not be expected to have notably different effects on aesthetics and visual resources than the current mill operations, and in some areas there could be improvements. The proposed project would result in some changes to the mill's appearance. The SEPA EIS (Port Angeles 2010a, pp 11-12) presents rendered photographs of what the altered mill would look like depending on whether a building or silo

was selected for the proposed biomass storage facility. If selected, the silo might be considered to have a more dominant appearance due to its height, but in either case the new facilities would simply be part of the mill.

The water cooling equipment or towers that are included in the most recent design (Section 2.2) would represent another project element with a potential added visual effect. A specific configuration or manufacturer has not yet been determined for these pieces of cooling equipment, but it is expected there would be up to four units reaching up to 25 feet in height. The intent is to place the units on an existing foundation on the Strait side of the plant (Figure 2-3). At that location, the units likely would not be visible from the community to the south or possibly even from Marine Drive running through the plant. However, cooling towers can generate plumes of condensing water vapor (often called steam plumes) during certain atmospheric conditions and such plumes would be visible from areas outside the paper mill. Since the paper mill already generates steam for use throughout the plant, steam plumes are a normal feature of day-to-day operations; the new cooling equipment would be another source. Nippon expects heaviest use of the cooling equipment to occur during summer months when the need to remove waste heat from the process would be the greatest. Higher ambient temperatures during summer would tend to minimize the extent of steam plumes as a result of high evaporation rates.

Cooling towers also have the potential to cause fogging when plumes are driven to the ground by windy conditions and ice episodes at ground level when fogging occurs during freezing conditions. As noted previously, steam plumes are already a normal feature of the paper mill operations and based on past experience, Nippon indicates that fogging and ice episodes have not been a problem for the site (Smith 2011e). This would not be expected to change with the proposed project and the new cooling tower equipment. Further, were such conditions to occur, west winds by far predominate the site and fogging would be expected to be limited to Ediz Hook and adjacent water bodies.

With respect to the Waterfront Trail, the new facilities would be set back farther than many of the buildings the trail now passes by and one of the closest buildings to the trail, the main office building, would be removed. The fact that the biomass storage would be inside a structure with an associated reduction in equipment noise and in windblown dust would likely be viewed as an improvement by users of the trail. Reduced noise from improved steam valves and reductions in air emissions could also provide improved conditions for users of the trail and other recreational features in the area. Thus, DOE believes the proposed project would not result in a notable change to, and could even slightly improve the paper mill's aesthetic and visual resource values. The bottom line, however, is that the paper mill is, and would remain an industrial facility. Also, as was noted in the discussion of construction activities, aesthetic and visual resource values are very subjective and it is recognized that some individuals may find the changes objectionable.

Eventual decommissioning would require the same types of activities as construction and, similarly, would be expected to have relatively modest visual effects (other than the change of eliminating the visual impact of the cogeneration facilities).

3.1.2.6 Noise

The Nippon paper mill operates 24 hours per day, 7 days a week and is recognized as a long-term dominant source of noise within Port Angeles. Mill noise includes a fairly constant background from lighting, motors, and vent fans. Other routine (though not constant) noise includes trucks, conveyors, pulverizers, loaders, and other heavy equipment. Other notable sound sources in the general area include traffic on U.S. Highway 101 (US 101), port operations, marine industries, air traffic, and the U.S. Coast Guard Air Station on the east end of Ediz Hook.

The mill is located in an area classified as industrial (Port Angeles 2010b). The closest residential areas are to the southwest of the mill and although these residential areas are as close as about 250 feet to mill property, they are about 1,800 feet from the site of the proposed project. On the west and south boundaries of the mill property are bands of land designated as open space, which provide some separation between the residential and mill properties.

Sound is a result of fluctuating air pressure. The standard unit for measuring sound pressure levels is the decibel. A decibel is a unit that describes the amplitude (or difference between extremes) of sound. Typically, environmental and occupational sound pressure levels are measured in decibels on an A-weighted scale (dBA). The A-weighted scale de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear [i.e., using the A-weighting filter adjusts certain frequency ranges (those that humans detect poorly)] (Colby et al. 2009). On the average, each A-weighted sound level increase of 10 decibels corresponds to an approximate doubling of subjective loudness.

Noise is any unwanted, undesirable sound. It has the potential to interfere with communication, damage hearing, and, in most cases, it is viewed as an annoyance. Noise can occur in different volumes and pitches depending on the type of source and the distance from a receptor. It is important to consider the amount of noise that would be created during both the construction and operation phases of a project so as to not inconvenience people working or living in the surrounding areas (HUD 2009).

As described in the SEPA EIS (Port Angeles 2010a, pp 23-26), a sound survey was conducted by mill owners in 1999 to obtain a baseline for sound levels (including the mill's contribution to those levels) and to check for compliance with noise standards in the neighboring areas. The SEPA EIS presented applicable results from that survey. For purposes of this discussion, Figure 3-3 provides approximate locations of the three applicable monitoring sites based on the

Figure 3-3. Approximate Locations of 1999 Sound Monitoring Sites (estimated from descriptions in the SEPA SEIS)

descriptions in the SEPA EIS and Table 3-7 summarizes the results in dBA. In considering the sound levels in table, it should be noted that normal conversations are in the 44 to 65 dBA, and noise levels exceeding 85 dBA over continuous periods can result in permanent hearing loss. It is also significant to note that most people do not perceive a change in sound levels of less than 3 dBA.

Table 3-7. Results for Applicable Sites from the 1999 Sound Monitoring Study

Monitoring Site	Average of Measured Sound Levels (in dBA)		
	Day (7 a.m. to 7 p.m.)	Evening (7 p.m. to 10 p.m.)	Night (10 p.m. to 7 a.m.)
M1	57.1	58.5	56.6
M2	55.3	54.3	55.2
M3	54.1	53.9	52.3

Source: Port Angeles 2010a.

It can be seen in the data in Table 3-7 that average sound levels (all near 55 dBA) did not change significantly by time of day at any of the sites. Based on the "3 dBA" criterion identified above, an individual at any of the monitoring sites would likely feel that ambient noise levels were basically the same night and day. This is consistent with the paper mill being operated around the clock, but it is also consistent with noise sources such as wave action on the nearby shoreline, which was specifically identified as a possible contributing sound source at location M1. EPA guidelines recommend a limit of 55 dBA for areas outside of residences during daytime, but also

recommend a decrease of 10 dBA for residential areas during nighttime (EPA 1974). The sound levels in the table would be fairly representative of the outdoor conditions that would be experienced at the residences closest to the monitoring sites, but since they represent energy levels, sound dissipates over distance. Assuming the paper mill is the primary source of sound contributing to the measured values, residences twice as far from the mill would experience a reduction of about 6 dBA in the sound levels.

Noise regulations for the City of Port Angeles are found in Chapter 15.16 of its Municipal Code and this chapter adopts applicable sections of the Washington Administrative Code to address noise control. Table 3-8 summarizes the primary noise limitations set in the State code. The maximum permissible sound levels are set in terms of the classification of the area in which the sound source is located and in terms of the classification of the area that would receive the sound. For example, the paper mill is considered to be in a Class C industrial area, so by the State standard, sounds it emits during the daytime should be no greater than 60 dBA at the boundary of any residence. As can be seen in the table, the standards require that permissible

Table 3-8. A Summary of the Primary Noise Limitations Set in the Washington State Code

	Maximum permissible sound levels (in dBA) at the receiving property by Class			
	Class A			
Noise Source by Class	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.	Class B	Class C
Class A – residential areas	55	45	57	60
Class B – commercial areas	57	47	60	65
Class C – industrial areas	60	50	65	70

Source: Washington Administrative Code, Chapter 173-60 WAC, Maximum environmental noise levels.

limits be dropped by 10 decibels during nighttime when the receiving area is Class A (residential).

The regulations also establish specific exceptions to noise limits shown in Table 3-8 for noises of short duration. For example, the noise limits can be exceeded by 5 dBA for a total of 15 minutes in any 1-hour period. Of more significance to the paper mill, the regulations provide an exception to the nighttime reduction of 10 dBA for existing industrial installations which have consistently operated in excess of 15 hours per day for the previous three years. Therefore, even during nighttime, the regulatory requirement is that noise from the paper mill be limited to 60 dBA at the property line of residential areas.

Direct and Indirect Impacts

Temporary increases in noise levels would be expected during construction activities. Possibly the loudest of these activities, if used, would be pile driving to establish the deep foundations for the new facilities. Pile driving would likely occur during only one or two periods totaling less than a month and would be restricted to daytime hours. Pile driving can generate noise levels up to 105 dBA for nearby receptors, but by the time those sounds traveled to the nearest residence (about 1,800 feet away), they would be reduced by at least 30 dBA (Port Angeles 2010a, p 46). The resulting levels of about 75 dBA at the nearest residence could still be annoying, but they would be similar in intensity to commonly experienced noise sources such as lawnmowers and vacuum cleaners. The earth would absorb the energy imparted to the piles during driving such that no impacts to marine life would be expected. Since the Draft EA, Nippon made the decision

that piles would be augered into place, which would eliminate the loud, percussive sounds associated with pile-driving.

Other heavy equipment would be present during construction, including trucks, excavators, bulldozers, and concrete mixers, and tools (such as rock drills and jackhammers) and would contribute to the noise levels. These sound sources would not be expected to reach the decibel levels of a pile driver, but they could be in the 90- to 100-dBA range under worse-case conditions and still be annoying at the distance of the nearest residence (Figure 3-4). Furthermore, the heavy equipment likely would be present for a greater portion of the construction phase than the pile driver. Thus for worse-case conditions other than pile driving, sound levels at the nearest residences could be as high as the range of 60 to 70 dBA. Although the upper end of this range might still be annoying to many, the lower end of the range is typical of sound levels that might be expected in an office. Considering that construction actions are expected to be limited to daytime hours and that inside residences the sound levels would be

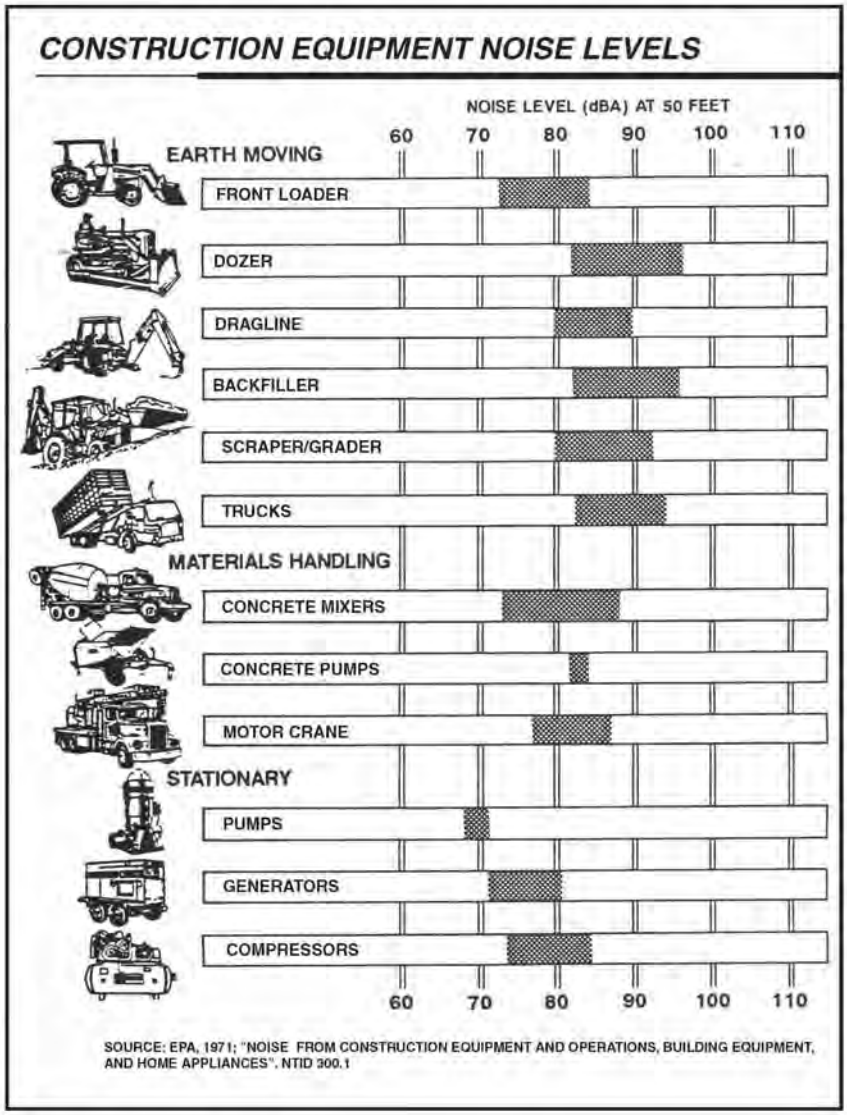


Figure 3-4. Typical Construction Equipment Noise Levels

further reduced by the presence of the structure, normal sound levels that would be generated during construction are not expected to present a major problem. However, it is recognized that some individuals may be more sensitive to sounds than others.

If for any reason, it was decided that construction work during nighttime hours (10 p.m. to 7 a.m.) was necessary, Nippon or the construction contractor would be required to obtain a noise variance from the City of Port Angeles if the nighttime construction noise would exceed the requirements in Table 3-8 at residential areas.

During operations, it is expected that sound levels associated with the new cogeneration system would be no worse and possibly lower than those associated with existing Boiler 8 operations. These expectations are based on the following:

- Under the proposed project, biomass fuel handling would be done inside a building using conveyors, which would significantly reduce the activity of the large bucket loaders currently used.

- Steam safety valves, which can be a significant source of operational noise when triggered, are necessary for the new facility, but new steam valves would be equipped with noise mufflers and would be directed toward the Strait of Juan de Fuca rather than toward the city.

- The turbine generator would represent a new source of sound, but it would be located inside a facility which would include sound insulation if necessary to maintain ambient conditions at their current levels.

Even if the new facility's operation was notably quieter than the existing Boiler 8 operations, it is recognized that there may be no perceived decrease in the overall noise level from the mill. Most of the existing sound sources within the mill would be unaffected. It is expected that the sound levels shown in Table 3-8 would still be representative of what would be received at the closest residences under the proposed project. Although the sound levels might be considered high for nighttime hours when residents are sleeping, the paper mill has been operating for over 90 years, likely before any of the closest residences were constructed. Sound levels are within the City's (and State's) noise standards, and of significance for this evaluation, they would not be adversely affected by the proposed project.

An additional source of operational noise that would occur is the increase in truck traffic that would be expected under the proposed project. There would be a long-term increase in truck deliveries to the paper mill to supply the added biomass that the cogeneration facility would use. It is estimated the number of trucks delivering biomass to the mill would increase from the current 20 to 25 per day to roughly 45 to 50 per day. Although the deliveries could occur any time of the day or night, it is expected that most would occur between 7 a.m. and 7 p.m. Traffic is already considered a primary noise source within Port Angeles and it is expected that the additional 25 truck deliveries per day would not represent a significant change to existing conditions or noise levels. The amount of traffic already experienced in this area is further discussed in Section 3.1.2.8.

Noise produced during decommissioning of the cogeneration facilities would be expected to be very similar to, if not less than, that generated during construction. The highest potential noise source during construction, pile driving, would not be present during decommissioning. With appropriate control of nighttime activities, significant noise impacts would not be expected.

3.1.2.7 Human health and safety

Occupational health and safety is concerned with occupational and worker hazards during routine operations. The U.S. Department of Labor, Bureau of Statistics maintains statistics on workplace injuries, illnesses, and fatalities. These statistics consider the potential for total recordable cases; days away from work, days of restricted work activity or job transfer; and worker fatalities in the work environment. The incidence rates (cases per 100 full-time workers for nonfatality statistics and cases per 100,000 full-time workers for fatality statistics) the Bureau of Labor Statistics maintains are calculated separately for different industries based on the reported health and safety cases for that particular industry. A full-time worker is assumed to work 2,000 hours per year. The health and safety incident categories are defined as follows:

- Total recordable cases – The total number of work-related deaths, illnesses, or injuries that result in the loss of consciousness, days away from work, restricted work activity or job transfer, or required medical treatment beyond first aid.

- Days away from work, or days of restricted work activity or job transfer – Cases that involve days away from work, or days of restricted activity or job transfer, or both.

- Worker fatality – Cases that involve the death of a worker.

In order to minimize the effect of industrial health and safety hazards, industries must comply with all applicable regulations that relate to industrial health and safety, including Occupational Safety and Health Administration requirements to have a health and safety plan in place before starting work.

Direct and Indirect Impacts

For construction activities, DOE used the Bureau of Labor Statistics incident rates from the category "construction of buildings" (NAICS Code 236) for 2009. It was judged that this type of construction was a reasonable representation of the work associated with demolition of facilities, excavation, constructing a foundation, and constructing the new buildings. The total recordable cases incidence rate for the year was 3.7 injuries per 100 full-time employees (each working 2,000 hours during the year), and the days away from work, days of restricted work activity or job transfer incidence rate was 1.9 injuries per 100 full-time employees (BLS 2010a). Based on the information in Section 2.2, DOE estimates that there would be 40 construction workers normally at the site during construction, which would take about 16 months, but during 2 months of peak activity there would be an additional 50 workers present. This represents a total of 740 worker-months (that is, 40 times 16, plus 50 times 2), or almost 62 worker-years. Assuming 2,000 hours per worker-year, estimates of incident occurrences can be calculated as follows:

Construction recordable cases

(62 worker-years)(3.7 incidents/100 worker-years) = 2.3 incidents

Construction days away from work
(62 worker-years)(1.9 incidents/100 worker-years) = 1.2 incidents

Accordingly, DOE estimates there would likely be 2 to 3 total recordable cases and 1 to 2 incidents involving days away from work during the construction phase. Standard best management practices for the construction industry would be implemented to reduce risks to workers. This would include, but not be limited to, complying with Occupational Safety and Health Agency regulation "Safety and Health Regulations for Construction" (29 CFR Part 1926).

In 2009, there were 150 fatalities in the "construction of buildings" industry category (BLS 2010b), which had an average employment of 1,552,000 workers (BLS 2010a). With construction of the proposed project involving almost 62 worker-years, an estimate of the number of fatalities that might occur based on statistics from similar work can be calculated as follows:

Construction fatalities
(62 worker-years)(150 fatalities/1,552,000 worker-years) = 0.006 fatalities

Based on this estimate, a fatality during construction would be very unlikely. The calculated value of 0.006 can be otherwise thought of as about 1 chance in 170 (the inverse of 0.006) that a fatality would occur.

Operation of the paper mill with the cogeneration facility would be very similar to current operations. Nippon estimates that once the new facilities were fully operational the mill's workforce would be only one person more than the current number of authorized full-time jobs. There is no reason to suspect that operation of the cogeneration facilities would present a more dangerous situation to workers, or involve tasks more prone to injury or accidents than current operations of Boiler 8. Accordingly, DOE believes operation of the cogeneration facility would involve no changes to the health and safety of the mill workers. Similarly, there would be no reason to believe the new facilities would have any notable change on the potential for health and safety concerns within the Port Angeles community.

The additional 25 daily truck deliveries of biomass that would be needed to support the cogeneration facilities would also involve some potential for accidents, injuries, and even fatalities to the increased number of workers. For these activities, DOE used the Bureau of Labor Statistics incidence rates from the category "general freight trucking" (NAICS Code 4841) for 2009. The total recordable cases incidence rate was 4.8 injuries per 100 full-time employees, and the days away from work, days of restricted work activity or job transfer incidence rate was 3.0 injuries per 100 full-time employees (BLS 2010a). Assuming there would be 25 new, full-time workers driving the trucks, estimates of incident occurrences can be calculated as follows:

Transportation recordable cases
(25 workers)(4.8 incidents/100 worker-years) = 1.2 incidents/year

Transportation days away from work
(25 workers)(3.0 incidents/100 worker-years) = 0.75 incident/year

DOE estimates that there likely would be 1 additional total recordable case each year and zero to 1 incident involving days away from work each year during operations. In 2009, there were 217 fatalities in the "general freight trucking" industry category (BLS 2010b), which had an average employment of 929,200 workers (BLS 2010a). If it is assumed that the life of the cogeneration equipment would be 20 years and the additional trucking needs lasted that long (that is, there would be a total of 500 worker-years involved in transportation), an estimate of the number of fatalities that might occur based on statistics from similar work can be calculated as follows:

Transportation fatalities

(500 worker-years)(217 fatalities/929,200 worker-years) = 0.12 fatalities

Based on this estimate, there is about a 1 chance in 9 (the inverse of 0.12) that a fatality associated with the additional transportation actions would occur over the 20-year operation phase.

Increased traffic to the paper mill during both construction and operations could pose an increased potential for accidents between vehicles entering or leaving the mill and bicyclists or pedestrians using the Waterfront Trail described in Section 3.1.2.5 and shown in Figure 2-3. Although there may not be good statistics from which to calculate the potential for this type of accident to occur, Nippon has recognized the potential concern and identified measures that could decrease the risk. Possible mitigation measures could include signs and markers to alert trail users and diversion of the trail from the west side of the Marine Drive to the east side (Port Angeles 2010a, p 50). Even taking such measures only during construction might reduce the potential for accidents.

Decommissioning would basically be the reverse of construction, though it would be expected to take less time. Assuming decommissioning required the same size workforce, took half the time, and that incident rates, some 20 years in the future, would be the same as the present, it can be concluded that there would likely be 1 to 2 recordable incidents, possibly 1 day away from work, and no fatalities during decommissioning.

3.1.2.8 Transportation

US 101 is the primary road connecting Port Angeles to areas to the west and to the east. Trucks delivering biomass to the Nippon mill site (currently and in the future) access the city via this route. Once within the city, trucks arriving from the west have a different route option to reach the mill site than do the trucks arriving from the east (Figure 2-1). Trucks from the west would access the mill site as follows:

- From US 101, access northbound State Route (SR) 117
- From SR 117 turn left on Marine Drive and continue to the mill site.

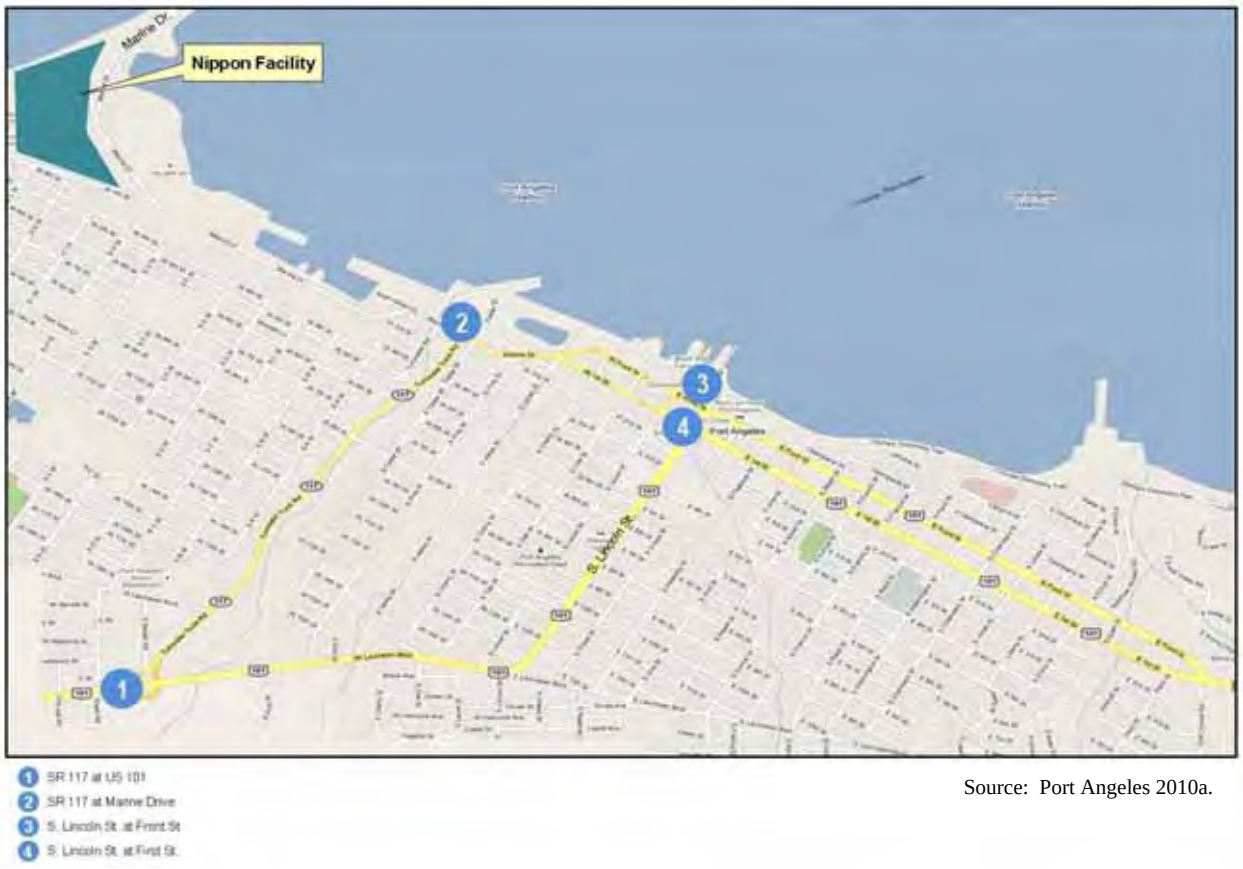
Trucks arriving from the east would access the mill site as follows:

- Transition from US 101 into one-way (westbound) E. Front St./US 101
- At the intersection of E. Front St./US 101 and N. Lincoln St./US 101 continue straight on E. Front St.

- Continue on E. Front St. to W. Front St. and transition to Marine Drive and continue to the mill site.

Return trips for the delivery trucks would simply be the reverse of those described above except those trucks going back toward the east would leave Marine Drive at the one-way (eastbound) couplet (of W. and E. Front St.), which is W. and E. 1st St. East 1st St. transitions directly into eastbound US 101. US 101 (including the 1st St. and Front St. couplet) and SR 117 are considered principal arterials and Marine Drive is considered a minor arterial.

As part of the SEPA EIS process, Nippon performed a Traffic Impact Study and the final report is included as Appendix B to the SEPA EIS (Port Angeles 2010a). The study targeted the four intersections shown in Figure 3-5 as the key points to characterize current traffic conditions and to evaluate how they might be affected by the increased traffic associated with the proposed project. Considering the figure, truck deliveries arriving from and returning to the west would



Source: Port Angeles 2010a.

Figure 3-5. Primary Intersections Addressed in the Traffic Impact Study

go through intersections #1 and #2. Truck deliveries arriving from the east would go through intersections #3 and #2 and on the return trip would go through intersections #2 and #4. The study determined that all four intersections experienced rush- or peak-hour effects during weekdays in the morning, from 7:30 to 8:30 a.m., and in the afternoon, from 3:30 to 4:30 p.m. Under current conditions, at peak hours, each of the intersections was characterized as operating with acceptable levels of service (Table 3-9). All of the intersections were rated to have a level

of service of B or C during the peak hours. Average vehicle delays for the four intersections over both peak hours ranged from 10.9 to 19 seconds per vehicle. According to the Traffic Impact Study, the City of Port Angeles designated the levels of service A through D as acceptable.

Table 3-9. Level of Service Criteria at Intersections with Signal Lights

Level of Service	Average Delay (seconds per car)	Traffic Flow
A	≤ 10	Most vehicles arrive during green phase and do not stop
B	> 10 to ≤ 20	More vehicles stop, causing higher delay
C	> 20 to ≤ 35	Vehicle stopping is significant, but many pass through without stopping
D	> 35 to ≤ 55	Many vehicles stop, influence of congestion more noticeable
E	> 55 to ≤ 80	Very few vehicles pass without stopping
F	> 80	Considered unacceptable to most drivers. Intersection is not necessarily over capacity, even though arrivals exceed capacity of lane groups

Source: Highway Capacity Manual, as referenced in Port Angeles 2010a, Appendix A.

Direct and Indirect Impacts

The Traffic Impact Study addressed peak traffic conditions that would be expected during construction for the proposed project. Estimates of peak traffic volumes and locations were developed using assumptions that included the following:

- There would be a 90-person workforce during the peak construction phase,
- Seventy percent of the workforce would not be permanent residents of Port Angeles,
- Ten percent of the workforce would carpool, and
- There would be up to four large or heavy vehicle trips (two inbound and two outbound) during morning and afternoon peak hours, with others occurring during non-peak hours.

The evaluations presented in the study indicated that the level of service at each of the primary intersections would not change as a result of the increased construction traffic and that there would be negligible change in the average vehicle delay. The highest increase in average delay was predicted to be 2.8 seconds at intersection #2 (Figure 3-5) during the afternoon peak hour. The conclusion of the Traffic Impact Study was that the added traffic associated with the proposed project's construction activities would not be expected to trigger any traffic operational deficiencies and, therefore, no mitigation measures would be necessary. However, the conclusion did note that traffic conditions should be monitored over the duration of the construction phase to ensure no adverse effects.

For the operations phase, the Traffic Impact Study evaluated the effects of the proposed project under current traffic conditions and for projected traffic conditions in 2030. Because the increased biomass deliveries could occur anytime, night or day, the decision was made to evaluate an assumed scenario of two deliveries (and returns) occurring during each of the peak hours. That is, it was assumed that 4 of the 20 additional deliveries (the number evaluated in the SEPA EIS) would occur during 2 hours of the 24 hours available, which was considered a conservative assumption. It was also assumed that half the deliveries would approach the city from each direction (east and west).

The evaluation presented in the traffic study indicated that under current (2010) traffic conditions, the added deliveries would not change the level of service ratings for any of the four intersections and the average delays per vehicle would basically remain the same. (A 0.1-second increase was predicted at one of the intersections.)

For the 2030 evaluation, the traffic study assumed traffic volumes would increase at a constant rate of 1.7 percent per year. Without the added traffic associated with the proposed project, each of the four intersections would still be operating at acceptable levels and, with the exception of intersection #1, would still be operating at a level of service of B or C. At intersection #1, 2030 traffic levels during the afternoon peak hour would result in a drop to a level of service of D. When the deliveries associated with the proposed project were added to the 2030 traffic volumes, evaluation of the resulting traffic numbers indicated there would be no change in the level of service ratings for any of the four intersections, and the average delays per vehicle would basically remain the same. (In this case, a 0.1-second increase was predicted at three of the intersections.)

The conclusion of the Traffic Impact Study was that the added traffic associated with the increased biomass deliveries would not be expected to trigger any traffic operational deficiencies and, therefore, no mitigation measures would be necessary. DOE believes the traffic study presents a rigorous approach to evaluate the impacts of the additional delivery truck traffic and that its findings and conclusions are reasonable. DOE also notes that the most recent estimates of biomass needs for the proposed project would result in a slight increase in the number of added truck deliveries; possibly up to another five per day. That is, instead of the 20 additional deliveries evaluated in the SEPA EIS and traffic study, there would be about 25 over current conditions. With the deliveries occurring over a 24-hour period, the added number would represent only about a 20 percent chance that another delivery would occur in any given hour than for the scenario evaluated in the traffic study. If four of the five added deliveries were assumed to occur during rush hour in the same scenario as evaluated in the traffic study, that would double the number of new rush-hour deliveries, but would still be only one additional truck from each direction during an entire hour. It is reasonable to conclude that impacts to traffic would continue to be minor even under this very conservative assumption.

Decommissioning of the cogeneration facilities would require equipment similar to that present during construction and would be expected to result in similar transportation issues to those dealt with during construction.

3.1.2.9 Socioeconomics

Socioeconomics is the study of the interrelation between social and economic factors. For NEPA analysis, these factors include demographics, employment, and income.

The socioeconomic impact area for the proposed project is Clallam County, Washington. Clallam County is a part of the U.S. Census Bureau Port Angeles, Washington micropolitan statistical area (CBSA 38820) (USCB 2010a). The county has a labor force of about 30,600 people (BLS 2010c) and there are about 37,400 jobs in the county (BEA 2010a). The diversified employment base includes eight industrial sectors that each account for at least 5 percent of the jobs: (1) government and government enterprise; (2) retail trade; (3) health care and social

assistance; (4) construction; (5) accommodations and food service; (6) other services except public administration; (7) real estate and rental and leasing; and (8) professional, scientific, and technical services (BEA 2010a). The majority of the county workforce (96.5 percent) resides in Clallam County (USCB 2003a). About 93.6 percent of Clallam County workers travel to a work site in the county (USCB 2003b). Therefore, the area most likely to experience socioeconomic impacts from the proposed project is Clallam County, Washington.

Port Angeles is one of three incorporated towns or cities in Clallam County. The county's estimated population of about 71,400 persons in 2009 reflects an 11.3 percent growth since 2000 (USCB 2010a). The city of Port Angeles had a 2009 population of about 18,900 people (USCB 2010b).

The Clallam County unemployment rate was 9.6 percent in November 2010, down from 11.5 percent in February 2010 (BLS 2010c). The November unemployment rate represents about 2,900 people out of work in the county (BLS 2010c). For comparison, the national unemployment rate was 9.3 percent in November 2010 (BLS 2010d).

In 2008, the total personal income in Clallam County was about $2.5 billion (BEA 2010b). The 2008 per capita income in Clallam County was about $34,600, or about 80 percent of the average per capita income of $42,700 across the state (BEA 2010c). In 2008, about 13.6 percent of Clallam County residents and 11.3 percent of Washington residents were living in poverty (USCB 2010a).

Direct and Indirect Impacts

The construction of the foundation and installation of the cogeneration facility would be of short duration (about 14 to 18 months). The normal construction workforce would be 40 workers, but during a 2-month peak period this would increase to 90 workers. It is expected that most of this workforce would come from outside Port Angeles and would stay in temporary living quarters (e.g., hotels and motels). An increase in the permanent population is not expected. The vendor would likely manufacture the cogeneration components outside Clallam County. Therefore, new permanent indirect jobs in the area would be unlikely. Because there would be no project-related change in the population in the area, there would be no meaningful impact to population, employment and income, community infrastructure, or public services. There could be a small, one-time boost in the economy from the construction and installation of the facility equipment. The projected total project cost of about $71 million would have a final earnings effect, because of the multiplier effect, of about $130 million.

Operation of the cogeneration plant would likely create one direct job, but it could help to preserve current jobs at the mill site. This is based on Nippon's characterization of the proposed project as not only a means of improving mill efficiency, but a diversification measure necessary to keep the mill viable and retain jobs. In addition, operation of the new biomass cogeneration boiler would help preserve community resources, especially by lowering operating costs and making Nippon more competitive. It is estimated that in the general Port Angeles region, there could be 20 to 25 new jobs created in biomass collection activities. Impacts to population, employment and income, and adverse impacts to the current level of public services and community infrastructure would be unlikely.

Like construction, decommissioning of the cogeneration facilities would involve new, short-term jobs for the area. However, they would be shorter in duration than construction and would involve little, if any, accompanying infusion of money for new equipment and materials. Decommissioning would not be expected to result in any project-related change in the population in the area and, as a result, there would be no meaningful impact to employment and income, community infrastructure, or public services.

3.1.2.10 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* and associated implementing guidance, establishes the framework for identifying impacts to low-income and minority populations. Executive Order 12898 directs Federal agencies to "promote nondiscrimination in Federal programs substantially affecting human health and the environment, and provide minority and low-income communities' access to public information on, and an opportunity for public participation in matters relating to human health or the environment." Executive Order 12898 also directs agencies to identify and consider disproportionately high and adverse human-health, social, economic, or environmental effects of their actions on minority and low-income communities and provide opportunities for community input to the process, including input on potential effects and mitigation measures.

As mentioned in Section 3.1.2.9, approximately 13.6 percent of the residents of Clallam County live in poverty and would be considered low-income. The U.S. Census Bureau reports that in 2009 the Clallam County population included 14.6 percent minorities (primarily American Indian at 5.4 percent and Hispanic at 5.1 percent) (USCB 2010a).

Direct and Indirect Impacts

DOE's analysis of environmental justice for this EA evaluates the consequences to environmental resources, such as air quality, socioeconomics, noise, and cultural resources that might affect human health or the environment for the general population. DOE then assessed whether there were unique exposure pathways, sensitivities, or cultural practices that would result in different impacts on minority or low-income populations. If high or adverse impacts on a minority or low-income population would not appreciably exceed the same type of impacts on the general population, no disproportionately high and adverse impacts would be expected.

For this EA, there are no measurable adverse impacts identified for resource areas other than cultural resources, as presented in Section 3.1.2.2. As presented in that section, the construction and excavation associated with the Nippon Biomass Cogeneration Project has the potential to adversely impact historically and archaeologically significant artifacts or human remains, which could be of traditional religious or cultural importance to the Klallam people. As a result, DOE has entered into formal consultations under Section 106 of the NHPA with the affected American Indian Tribe and the DAHP and is preparing an MOA, which will govern the activities associated with construction at the project site. Through the implementation of this MOA, potentially adverse effects to these cultural resources and to this minority population (the Klallam people) would be mitigated.

3.1.2.11 Waste and Hazardous Materials

The City of Port Angeles operates and maintains the City's solid waste collection system and contracts operations of the City's two transfer stations. Municipal solid waste generated within the City is collected and delivered to the transfer stations from where it is hauled out of the area to a regional landfill.

Nippon characterizes mill waste as comprising two primary waste streams plus a third for miscellaneous wastes. The first of the primary waste streams consists of 5,000 to 10,000 tons per year of rejected material from the mill's de-inking process and the second consists of 12,000 to 15,000 tons per year of ash from its biomass boiler (that is, Boiler 8) (Perlwitz 2011b). The rejected material is primarily plastics removed from waste paper before it goes into the de-inking or recycling plant and is the result of poor segregation of recycling materials in the various cities across the country that supply the waste paper. The third, miscellaneous waste stream consists of the miscellaneous trash items generated by the mill and generally makes up about 350 to 500 tons per year (Smith 2011f).

The Nippon mill contracts with Waste Management for collection of its solid waste, with the exception of the ash. Nippon takes the ash from Boiler 8 to its own landfill in Port Angeles for disposal. This landfill, located south of Port Angeles city limits at 250 Weiler Road (off Monroe Road), is referred to as the Lawson Landfill and is operated as a limited purpose landfill under a permit issued by Clallam County. Nippon also reports the landfill has remained in compliance with the operating permit requirements. Nippon indicates that over the last 5 years it has disposed of an average of about 12,600 tons of ash per year in this landfill (Smith 2011d). This is the ash generated from burning biomass and sludge from the mill's industrial wastewater treatment plant.

The Nippon paper mill manages hazardous materials that are used in mill processes. Nippon reports that these materials are managed in accordance with applicable regulations established for the protection of workers and the environment. This includes maintaining and making available information on the hazards associated with the materials along with their proper management during use and, as applicable, disposal. It also includes, as appropriate, physical means of containing leaks or spills such as secondary containment and separation from drains and other water collection systems.

Direct and Indirect Impacts

Waste generated during construction activities would be expected to consist primarily of debris from removing pavement and taking down buildings; then there would be routine construction debris generated as the new buildings were put up. Much of the material brought to the site during construction would consist of machinery and equipment delivered on flatbed trucks with little packing or other extraneous materials that would potentially become waste. All of the waste materials generated during construction, including excavated soils, would be recycled to the extent practicable with the remainder going through the City's solid waste collection system or directly to the transfer station for shipment to the regional landfill. These waste streams would be managed in accordance with applicable State and local regulations. They would be generated on a relatively short-term basis and would not be expected to overwhelm any of the

current collection and transfer systems or to significantly impact the capacity of the regional landfill.

The proposed project, as compared to current conditions, would not be expected to involve any additional production of solid waste during operation of the new facilities. Although the new boiler would process almost double the amount of biomass as now put through Boiler 8, Nippon's evaluations indicate that the new boiler's improved combustion efficiency would result in a volume of ash very similar to, if not less than that currently being generated. These estimates include the particulate matter from the new air pollution control equipment, which would be combined with the boiler ash for disposal (Smith 2011d). The ash would continue to be disposed of in the company-owned Lawson Landfill.

The proposed project would use injection of urea or ammonia as an element of the boiler air pollution control equipment. Both of these materials can be hazardous under certain conditions and either's use in the new facilities would represent a new or expanded use of hazardous material in the mill. However, neither of these materials would be considered particularly unusual in an industrial work place and common practices have been developed for their safe management. In accordance with applicable Occupational Safety and Health Administration standards, Nippon would ensure that design of the new facilities included the appropriate features to support safe handling and management of the selected material and that appropriate procedures were developed for its use.

Waste streams generated during decommissioning of the cogeneration facilities would consist primarily of building demolition debris and removed equipment. As during construction, these waste materials would be recycled to the extent practicable with the remainder going through the City's solid waste collection system or directly to the transfer station for shipment to the regional landfill. These waste streams would be managed in accordance with applicable State and local regulations. They would be generated on a relatively short-term basis and would not be expected to overwhelm any of the current collection and transfer systems or to significantly impact the capacity of the regional landfill.

3.1.2.12 Utilities and Energy

Utility services provided by the City of Port Angeles to the Nippon paper mill and discussed in this section include water (drinking), sewer, and electricity. These are the only utility and energy elements that could potentially be affected by the proposed project.

Drinking Water

The source of the drinking water for the City of Port Angeles is a Ranney Collector located adjacent to the Elwha River and extending to 62 feet below the ground surface. The collector's estimated capacity is 10.7 million gallons per day with the river flowing at a 1,100 cubic feet per second. The capacity increases or decreases slightly according to changes in the river's flow. Until recently, this water was sent to the City's

RANNEY COLLECTOR

A Ranney Collector is a type of radial well consisting of a vertical caisson with screened collectors extending horizontally from its bottom. It is typically constructed in sand or gravel below the surface of an adjacent lake or river and the amount of water available is generally related more to the surface water source than to the piezometric surface of the aquifer.

water distribution system with sodium hypochlorite disinfection as the only treatment. However, with a change in drinking water regulations, the Ranney Collector was classified as groundwater under the influence of surface water and the City's water system became subject to the Surface Water Treatment Rule that requires additional treatment or measures to ensure the additional treatment is not required. This issue was resolved by the construction of a municipal water treatment system that went into operation in early 2010 (Port Angeles 2010c). This new facility has a capacity of 10.6 million gallons per day of treated water (NPS 2010). If it is assumed this plant operates 365 days per year, this equates to an annual capacity of over 3,800 million gallons. In 2009, about 1,000 million gallons of water was collected and sent through the City's water system (Port Angeles 2010c), so both the Ranney Collector and the water treatment plant have significant excess capacity. With a 2009 population of about 18,900 (Section 3.1.2.9), the average water consumption per Port Angeles resident in 2009 was about 150 gallons per day and this includes distribution losses that are estimated at 15.6 percent (Port Angeles 2010c), so actual daily consumption per person would be less.

Direct and Indirect Impacts

It is estimated there would be as many as 90 individuals working on construction activities for the proposed project. If it is assumed that every one of these people were new to the community, were temporarily living there, and used the same amount of water as other residents (that is, about 150 gallons per day) construction workers could require as much as 13,500 gallons per day of additional drinking water. This conservative estimate of additional water represents only about 0.13 percent of the water treatment plant's capacity of 10.6 million gallons per day and only a slightly larger portion of the City's excess capacity. There would also be other demands during construction such as water needed for compaction of fill materials and dust suppression, but Nippon would meet these demands using its industrial water supply (described in Section 3.1.2.3).

During operation of the plant, there would be no additional demand for drinking water from the mill. Nippon forecasts only a single additional mill employee as a result of the proposed project and the additional water required for the new boiler and turbine generator would not be from the drinking water supply. (As described in Section 3.1.2.3, the additional water demand for the new process equipment would come from the plant's industrial water supply.) Therefore, there should be no impact to the water system utility during operations under the proposed project.

Water demands during decommissioning would be for uses similar to those during construction, primarily quantities to support worker needs and for dust suppression activities. However, the duration of these activities would be less than for construction and there likely would be fewer workers involved. These volumes would not be expected to present capacity problems for the Port Angeles water distribution system.

Sewer

The City of Port Angeles' wastewater system consists of 117 miles of sanitary and combined sewers ranging from 4 to 48 inches in diameter, 10 pump stations, about 7,200 service connections, and a wastewater treatment plant. The treatment plant was designed with a capacity to accommodate a population of 24,800 (Port Angeles 2011a). Considering the 2009 population of Port Angeles was about 18,900 (Section 3.1.2.9), the plant should have about 30 percent excess capacity compared to current loading.

Direct and Indirect Impacts

As noted previously, there could be as many as 90 additional workers at the mill during construction activities. Again assuming these workers basically represented new residents to the city, although temporary, they would result in an increase of about 0.5 percent to the city's population and a similar increase to wastewater flow to the treatment plant. This would use up a very small portion (about 1.5 percent) of the treatment plant's excess capacity and would not be expected to result in any adverse impacts to the city's wastewater system.

Since there would be no real changes to the mill's workforce during operations, there would be no change to the volume of sanitary sewerage produced by the mill and no impact to the wastewater system. The additional water that would be needed for operation of the new equipment would not result in additional wastewater going to the city's system; additional wastewater from those operations would consist only of added cooling water that would be treated in the mill's industrial wastewater system as described in Section 3.1.2.3.

Sewage production during decommissioning activities would be expected to be less than during construction and, similarly, there would be no adverse impacts to the city's wastewater system.

Electricity

The City of Port Angeles operates the municipal electric utility that provides electrical service to the city. The utility includes over 9 miles of transmission lines, 103 miles of overhead distribution lines, over 40 miles of underground distribution lines, and 7 substations, and services over 10,500 customers. The City operates the Morse Creek hydroelectric facility and purchases all other electricity from the Bonneville Power Administration (Port Angeles 2011b). The Nippon paper mill obtains its electricity from the municipal electric utility and has an average electrical load of about 50 megawatts (Perlwitz 2011c).

The Bonneville Power Administration is a Federal non-profit agency based in the Pacific Northwest and its service area includes Washington, Oregon, Idaho, and western Montana, as well as small portions of California, Nevada, Utah, and Wyoming. Bonneville Power provides about one-third of the electricity in the Northwest from 31 Federal hydroelectric facilities, one non-Federal nuclear plant, and several other small non-Federal power plants. Bonneville Power also operates over 15,000 miles of transmission lines and 260 substations, and produces energy at a firm annual average of 8,826 megawatts with a sustained 1-hour peak capacity of 18,326 megawatts. Almost 79 percent of the firm annual average quantity comes from hydroelectric facilities (BPA 2010).

At the state level, Washington's capacity for generating electricity is 2.9 percent of the nation's capacity, with a summer production capacity of 30,095 megawatts. Actual electricity production in October of 2010 was 7.79 million megawatt-hours (DOE 2011b). Assuming this was produced evenly over a 24-hour day for 31 days in the month, this equates to an average production rate of about 10,470 megawatts. Peak production during the month was likely much higher than the 10,470-megawatt average.

Direct and Indirect Impacts

The paper mill's average electrical demand would remain at about 50 megawatts after the cogeneration plant was in operation and Nippon would continue to purchase that electricity from

the City of Port Angeles (Perlwitz 2011c). The proposed project would involve a peak electrical power production capability of 20 megawatts. This power would be sent directly to the electrical grid for sale to a utility. The project is expected to have a minor positive impact on the electricity generating capacity currently tied to the electrical grid of the region. It would also have the benefit of involving a renewable, greenhouse-gas-neutral energy source and could potentially offset energy production that would otherwise come from a power plant using fossil fuel.

Decommissioning would involve no significant use of electricity, but it would remove a 20-megawatt generating source from the regional electricity generating capacity.

3.2 No-Action Alternatives

3.2.1 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, DOE would not authorize the use of Federal funds for the design, permitting, and construction of the proposed project. Even though DOE funding is less than 3 percent of the total project costs and the project would likely continue with or without Federal funds. DOE assumes, for purposes of this EA, that the project would not proceed without SEP funding. Therefore, there would not be any impacts to the resource areas analyzed in this EA. The Nippon paper mill would continue to use biomass fuel to create steam for its processes, but there would be no added benefits or efficiencies realized from the new boiler system.

Under the assumption of the No-Action Alternative, there would be no additional electricity (up to 20 megawatts) supplied to the region's electrical grid. This amount of electricity would continue to be produced, at least in part, through the use of fossil fuel, so there would be no reduction in fossil fuel usage. Without the proposed project, the infusion of about $130 million into the local economy would not be realized and the retention of current jobs at the site could be jeopardized. Nippon has characterized the proposed project not only as a means of improving mill efficiency, but as a diversification measure necessary to keep the mill viable and retain jobs.

3.2.2 NO-ACTION ALTERNATIVE SUBCATEGORY – PROJECT ALTERNATIVE

This section provides discussion of potential environmental effects of a project alternative that DOE considers a subcategory of the No-Action Alternative and compares it to the existing operations and the proposed project. Also, as described in Section 2.3.2, DOE's decision is limited to authorizing use of Federal funds for the proposed project. Because it is not an option that DOE could choose, this project alternative was not developed to a level of detail similar to that for the proposed project and, as a result, evaluations are qualitative in nature. The short discussions in this section are presented in the same order as was presented in Section 3.1 for the proposed project.

3.2.2.1 Considerations Not Carried Forward for Further Analysis

The four resource areas (land use, geology and soils, groundwater, and intentional destructive acts) considered to have minimal potential for being affected by the proposed project would

likely not be affected by the project alternative. The proposed project, with the cogeneration element, would not represent a significant change in land use, and so the project alternative without cogeneration would not as well. The project alternative would not impact the geology or soils of the area and would have the same potential as the proposed project to be adversely impacted by area geology and soil conditions. Neither the proposed project nor project alternative would affect groundwater, and DOE would not consider the area particularly attractive targets for terrorists or saboteurs, regardless of the alternative.

3.2.2.2 Considerations Carried Forward for Analysis

Air Quality

Because the project alternative would involve a similarly sized boiler with improved efficiency and increased emission control equipment, emissions of all air pollutants would be expected to be lower than current operations of Boiler 8. The new boiler would use less fossil fuel (fuel oil) than Boiler 8, but there would be no corresponding decrease of fossil fuel represented by the production of 20 megawatts of electricity elsewhere. To the extent that the proposed project would reduce the occurrence of in-place burning of forest residues, the project alternative would not involve additional demand for forest biomass so there would be no such reduction.

Like Boiler 8, the new boiler would have a capacity of 236 million Btu per hour, compared with the 420 million Btu per hour capacity of the proposed project. Assuming the new boiler used fuel oil at a similar ratio (fuel oil to boiler capacity) to that estimated for the proposed project, the decreased fuel oil use would result in GHG emissions being slightly less (estimated at 7,400 tons per year less) than for the current operation of Boiler 8. Depending on the ultimate accounting strategy formulated by EPA, there would be no potential for large decreases in GHG emissions compared to current operations.

Cultural Resources

The project alternative would be expected to pose a potential for impacts to cultural resource similar to that of the proposed project. Although the ground disturbance footprint would be less under the project alternative, there would still be the potential for adverse impacts to resources at the site and there would still be the need for planning and agreements to govern the proposed excavation activities of the project. That is, there would still be the need for something similar to the MOA developed for the proposed project under Section 106 of the NHPA. However, under the No-Action Alternative subcategory (no Federal funding), the Federal government would not be involved in the Section 106 consultation process, so planning and agreements would be developed pursuant to State law to mitigate potential adverse effects.

Water Resources – Surface Water

The project alternative, like the proposed project, would be required to implement storm water runoff precautions during construction, but during operations the project alternative would be expected to involve the same potential for adverse effects to surface water as the existing operation. Components of the replacement boiler would still be located in the flood zone and would have to incorporate appropriate design considerations to protect property. The project alternative would not result in any additional water demand over current mill operations and, as a result, there would be no additional effects to low water flow in the Elwha River.

Biological Resources

Like the proposed project, the project alternative would be located within the developed, industrial-use footprint of the existing paper mill, where the area has already been disturbed and developed, and does not represent habitat of concern for any plant or animal species. Since the demand for forest biomass would remain at current levels, there would be no increased pressure on this resource. However, there also would be no added use of biomass that would support the DNR's Forest Biomass Initiative for optimizing the use of biofuel.

Aesthetics and Visual Resources

The project alternative would be expected to leave the mill appearance unchanged from current conditions. Additional noise, dust, and traffic during construction activities would be adverse effects, but since the project alternative would be a smaller project with fewer new facilities, these adverse effects would occur for a shorter duration than for the proposed project. The project alternative would not require the added water cooling equipment or towers, so any adverse effects that might be attributed to this element of the proposed project would be eliminated. New facilities associated with the project alternative would be expected to be set back away from the Waterfront Trail; however, it is assumed the mill building closest to the Trail, the one that would be demolished under the proposed project, would stay in place.

Noise

Sound levels generated during construction of the project alternative would be similar to those described for the proposed project, but the construction duration would be shorter. Since the project alternative would not involve a steam turbine, sound levels during operations would be expected to be basically unchanged from those of current operations.

Human Health and Safety

The potential for accidents or fatalities to occur during construction of the project alternative would be less than those estimated for the proposed project because the duration and scale (number of man-hours) of construction activities would be less. Operation of the new boiler basically would be the same as for current operations as would be the number of trucks delivering biomass for the boiler. Therefore, the potential for accidents during these activities would remain unchanged.

Transportation

There would be additional delivery trucks and passenger vehicles accessing the mill during construction, but the numbers would be fewer than for the proposed project. Operation of the new boiler would be expected to involve roughly the same number of fuel deliveries as for existing operations. The amount of fuel oil used would be decreased, but deliveries of fuel oil would be minor in comparison to those for biomass fuel.

Socioeconomics

Construction under the project alternative would result in a positive impact to the regional economy, but it would be less than for the proposed project. There would be fewer workers required for the construction and/or they would be needed for a shorter period of time. During operations, employment at the mill would remain unchanged and there would be no increase in jobs in biomass collection activities. Since the project alternative would not involve cogeneration of electricity, it would do little to improve overall mill efficiency (the new boiler

could be more efficient than Boiler 8, but it would not equal the energy efficiency of a combined heat and power application) and would not represent a business diversification measure that could provide a benefit to the economics of the mill.

Environmental Justice

As with the proposed project, the only measureable adverse impact that could potentially have a different effect on minority or low-income populations would be that associated with cultural resources. As noted above, the potential for construction activities to encounter culturally sensitive items during excavation would still be present under the project alternative and would still have to be mitigated.

Waste and Hazardous Materials

Waste generated during construction would be less than for the proposed project due to the decreased scope of the project alternative. During operations, the increased efficiency of the boiler would be expected to decrease the amount of ash that would be disposed of at the company-owned Lawson Landfill. The urea or ammonia that would be used and stored under the proposed project for boiler air pollution equipment would also be needed for the project alternative, although possibly in a smaller quantity.

Utilities and Energy

There would be added drinking water demand and sewage production during construction for the project alternative, but amounts would be less than for the proposed project. There would be no change to utility loads during operations. The project alternative would have no effect on the mill's electrical energy consumption and would involve no new source of electrical energy to the grid.

3.3 Irreversible and Irretrievable Commitments of Resources

A commitment of resources is irreversible when its primary or secondary impacts limit the future options for a resource or limit those factors that are renewable only over long periods of time. Examples of nonrenewable resources are minerals, including petroleum. An irretrievable commitment of resources refers to the use or consumption of a resource that is neither renewable nor recoverable for use by future generations. Examples of irretrievable resources are the loss of a recreational use of an area. While an action may result in the loss of a resource that is irretrievable, the action may be reversible. Irreversible and irretrievable commitments of resources are primarily related to construction activities.

For the proposed project, resources consumed during construction of the project, including labor, fossil fuels and construction materials, would be committed for the life of the project, which is assumed to be 20 years, consistent with the period of time analyzed in Nippon's feasibility study. (However, it is recognized that the actual life of the project facilities may be greater.) Nonrenewable fossil fuels would be irretrievably lost during construction through the use of gasoline- and diesel-powered construction equipment. The expenditure of ARRA funding from DOE would be irreversible. The proposed project would take place on land that has already been irreversibly committed for the life of the paper mill and would not pose any new commitment of land.

3.4 Unavoidable Adverse Impacts

Unavoidable adverse impacts associated with the proposed project include:

- Increased emissions of fugitive dust and exhaust from vehicles and equipment during construction and increased emissions of nitrogen oxides and, in the short-term, GHGs during operations;
- Cultural resources potentially beneath the project site could be disturbed during construction;
- Removal of additional water from the Elwha River during operations could have minor, but incremental adverse effects on fisheries habitat during periods of low River flow (once the River has stabilized after the dam removal actions);
- Increased noise during construction;
- Minor potential for accidents and injuries during construction; and
- Increased truck and personal vehicle traffic around the paper mill during construction and increased biomass delivery truck traffic during operations.

These impacts are both temporary, in the case of the construction noise, air emissions, and accident risk, and long-term, in regard to the increased emissions of nitrogen oxides, water demand, and biomass delivery truck traffic. Were it to occur, destruction of or damage to archaeologically or culturally significant materials would also be a long-term impact. Overall, impacts of the proposed project on the environment and human health would be minimal with the mitigation measures that would be taken to minimize the potential for adverse impacts to cultural resources.

3.5 The Relationship Between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

Short-term use of the environment, as the term is used in this document, is that used during the life of the project, whereas long-term productivity refers to the period of time after the project has been decommissioned, the equipment removed, and the land reclaimed and stabilized. The short-term use of the project area for the proposed project would not affect the long-term productivity of the area. If it is decided at some time in the future that the paper mill has reached its useful life, the boiler, turbine generator and other facilities added under the proposed project, along with the rest of the mill could be decommissioned and the site reclaimed, recontoured, and revegetated with native plants to resemble the pre-disturbance conditions. The installation of a biomass cogeneration facility at this site would not preclude using the land for purposes that were suitable prior to this project.

4. CUMULATIVE IMPACTS

Cumulative impacts are those potential environmental impacts that result from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

4.1 National Park Service – Elwha River Restoration

The NPS' Elwha River Restoration project is one of the few past, present, or reasonably foreseeable future action identified at this time with the potential to involve impacts cumulative with those of the proposed project. As described in Section 1.1 of this EA, the principal elements of this project are the removal of the two existing dams on the Elwha River and the associated restoration of the river's ecosystem and native anadromous fisheries. In addition to removing the existing dams, the project involves several other significant activities that are referred to as mitigation measures to deal with specific river conditions that will result from removal of the dams. These additional activities have the following goals: "(1) to protect municipal and industrial water users and two fish propagation facilities (hatcheries) during dam removal, (2) to provide flood protection at current levels, (3) to provide the ability to treat wastewater for those residents whose septic systems would be rendered ineffective, and (4) to protect listed fish to the maximum extent possible during and following dam removal" (NPS 2005). Specific actions to accomplish these goals and that could involve cumulative effects with the proposed project include:

- A new surface water diversion and intake for Port Angeles diversion of industrial water (and now for backup of municipal water) from the Elwha River;

- A new water treatment plant to remove suspended solids from water going to hatcheries and to industrial and municipal users (including Port Angeles) during dam removal; and

- A municipal water treatment facility for Port Angeles drinking water.

Other mitigation actions to be implemented include improving existing levees along the river, providing flood protection or alternate water supplies for affected groundwater users, moving the tribal fish hatchery, and creating alternate rearing ponds for the Elwha Chinook during dam removal.

Resource areas identified in the NPS EIS as potentially affected by the Elwha River Restoration project are as follows:

- Flooding
- Surface Water
- Groundwater
- Native Anadromous and Resident Fisheries
- Soils
- Vegetation

- Wildlife
- Species of Special Concern
- Air Quality
- Noise
- Cultural Resources
- Socioeconomic Environment
- Public Health and Safety

Of the above resource areas, the ones that could potentially involve cumulative impacts with those of the proposed project are judged to be surface water, fisheries, air quality, noise, cultural resources, socioeconomics, and public health. An additional resource area that involves cumulative impacts, but which was not addressed in the NPS EIS, is transportation. These resource areas are addressed in the paragraphs that follow.

Surface Water

Cumulative impacts result from the proposed project's demand for additional industrial water from the Port Angeles' diversion from the Elwha River. Surface water issues addressed in the NPS EIS deal primarily with the changes in flood levels and water quality that would be expected to occur as a result of removing the dams. The primary water quality issue would be the increased sediment loads or turbidity that would occur for some time as the material deposited historically behind the dams was carried downstream. With or without the proposed project, the NPS actions have already addressed the concern by the recent construction of a water treatment plant at the diversion point. This plant was designed to address the increased turbidity in the river before the water is sent to the city's industrial water users. Although the proposed project is not expected to involve significant increases in the paper mill's demand for drinking water, NPS actions have also included recent construction of a new municipal water treatment plant that would provide a benefit for all users of the Port Angeles drinking water distribution system.

Native Anadromous and Resident Fisheries

A principal objective of the NPS project is restoration of the Elwha River's ecosystem and native anadromous fisheries. As identified in the preceding surface water discussion, cumulative impacts could result from the proposed project's demand for additional industrial water from the Port Angeles diversion from the Elwha River. The added demand, combined with the amount already diverted, would act to reduce the water flow in the bottom section of the River, below the diversion point, and potentially affect fish habitat and movement. The Elwha River Fish Restoration Plan (Ward et al. 2008) and the Water Resources Inventory Area 18 Watershed Plan (Clallam County 2005) described in Section 3.1.2.3 of this EA further address the water rights that have been granted on the Elwha River and the adverse effects those water rights potentially could have on the River's fisheries habitat during periods of low flow. These two plans describe an approach for dealing with this issue that would involve: (1) evaluating the River to establish minimum instream flows that would conserve fish recovery needs, (2) developing a water conservation strategy (for implementation by the City of Port Angeles as the largest holder of water rights) for low flow periods that incorporates the needs of fish as the primary trigger, and (3) prohibiting additional water rights from being issued for the Elwha watershed until the first two efforts were in place so that potential effects of additional water rights could be fully

evaluated. The Plans also recognize that this approach, with the exception of stopping additional water rights, cannot be started until the dams have been removed and the River has stabilized, which is expected to take up to 10 years after the dams are completely gone. In the interim, the sediment moving through the River system and the changes and damages it will cause to habitat will be the overriding issue with regard to impacts to fisheries, not the amount of water removed for ongoing water demands. The City of Port Angeles has concurred with the Watershed Plan and its approach to address water needs for Elwha River habitat. As indicated in Section 3.1.2.3 of this EA, the extent to which eventual conservation measures might affect the Nippon operations cannot be known at the present time. However, the added 1.2 million gallons of River water per day associated with the proposed project would remain a very small portion of the overall issue and would not be expected to affect the eventual outcome.

Air Quality

The NPS activities would involve the production of air emissions in the form of fugitive dust and equipment emissions. To an extent, these emissions would be additive with those from the proposed project; that is, when they occurred during the same timeframe. Several of the mitigation actions associated with the NPS project have already occurred and the dam removal actions are scheduled to start in 2011 and take 2.5 to 3 years (NPS 2011). Air emissions from the NPS project are expected to be minor and would not add significantly to those of the proposed project.

Noise

Both projects would involve noise, particularly during construction-type activities, but the distance separating the projects would be expected to prevent the noises from being additive at any receptor location.

Cultural Resources

Potential cultural resource impacts associated with the two projects could be cumulative, primarily to the extent that both could have effects on resources or artifacts that are of traditional religious or cultural importance to the Klallam people. In both projects, mitigation measures have been included to minimize the potential for adverse impacts. In the case of the NPS project, primary elements of the action will have beneficial impacts to cultural and tribal resources, including restoring fish runs and shellfish harvests and other effects of a free-flowing river. As noted previously, the NPS evaluations and actions to achieve a free-flowing river included an assumed full diversion of Port Angeles' existing surface water right from the Elwha River and thereby included Nippon's existing industrial water demand as well as the additions to Nippon's industrial water demand under the proposed project.

Socioeconomics

Both projects would provide the benefits of added jobs and influx of money into the local area's economy. The NPS project is a more costly effort, estimated at about $350 million (NPS 2011), but would be spread over a longer time period.

Public Health and Safety

Neither project would be expected to involve significant risks to the public, but both would involve construction activities that could pose safety risks for workers. In combination there

would be more workers involved and a higher probability of accidents and injuries, but the risk per individual would be expected to be similar and minor for either project.

Transportation

The NPS project will involve increased traffic in the same area as would the Nippon project. US 101 provides the primary access to work areas along the Elwha River and was identified in this EA as a primary transportation route for the Nippon project. However, impacts from the Nippon project were evaluated in a traffic study and shown to be very minor and would add little to transportation issues might be associated with the NPS project.

In summary, cumulative impacts of the two projects would not be significant and would not differ from those analyzed and presented individually for each project.

4.2 Other Biomass Projects in the Region

There are two[2] other planned biomass projects in the region (in this case, the Olympic Peninsula) that could have cumulative impacts with those of the proposed project. ORCAA reports it is currently working on the air permitting processes for two different biomass projects, one of which is the Nippon proposed project (ORCAA 2011b). The other biomass project, which is closest to Port Angeles, is one being proposed in the City of Port Townsend and the air permitting process for this project is being processed by the State of Washington Department of Ecology. The two identified biomass projects in the region (in addition to the Nippon project) are briefly summarized as follows:

- The Solomon Renewable Energy Company is proposing a 31-megawatt biomass-fired cogeneration facility, also in Shelton, Morton County, Washington. The Solomon permitting action is still in the NOC review process and is identified on the ORCAA Website as "Incomplete – Awaiting further documentation" (ORCAA 2011d). Shelton is approximately 65 miles south of Port Angeles.

- The Port Townsend Paper Corporation is proposing a 24-megawatt biomass-fired cogeneration facility for its paper mill in the City of Port Townsend, Jefferson County, Washington (PTPC 2011), which is about 30 miles east of Port Angeles. The City of Port Townsend permit process has completed its public comment period and the State of Washington Department of Ecology issued a final Notice of Construction Order on October 22, 2010 allowing the Port Townsend Paper Corporation to upgrade a boiler at its mill (Ecology 2010). A coalition of environmental groups (consisting of five of the same groups opposing the Nippon project) appealed the Department of Ecology action (Peninsula Daily News 2010d). The appeal is scheduled to be heard June 2 and 3, 2011 (Peninsula Daily News 2011).

Shelton, Washington is on the other side of the Olympic Mountains from Port Angeles about 65 miles straight distance. However, this project could possibly be considering the same sources of biomass, so there could be cumulative impacts, as discussed below, to forest areas where the

2. The Draft EA described a proposal by ADAGE Morton LLC for a 65-megawatt biomass-fired power plant near Shelton, Morton County, Washington. Since that time, the ORCAA announced that ADAGE has withdrawn its NOC application, citing poor market conditions for energy production (ORCAA 2011c).

biomass is generated. The Port Townsend project, being closer to Port Angeles and also being located on the northern coastal area of the Olympic Peninsula, would be more likely to involve impacts cumulative with those of the Nippon proposed project.

On a regional scale, all of the biomass projects are expected to provide opportunity for additional jobs, particularly during construction activities and also in biomass collection activities. Each of the projects would also represent minor positive impacts on the electricity generating capacity of the region, but even in combination, the 75 megawatts of additional generating capacity would be only about 0.25 percent of the 30,000 megawatts of generating capacity within the state. All of the projects would have the benefit of off-setting energy production that might otherwise come, at least in part from a power plant using fossil fuel.

Areas of more localized cumulative impacts are addressed in the following topical discussions.

Transportation

US 101 does not run through Port Townsend, but it is a primary access road to the Port Townsend area. If the Port Townsend biomass-fired boiler were to obtain any of its feedstock from the northwest portion of the Olympic Peninsula, delivery trucks would have to pass through Port Angeles to reach Port Townsend, adding to traffic in Port Angeles. Delivery trucks from the west would pass through intersection #1 with no stop or signal, continue on US 101 to intersection #4, turn right at that signal, and continue out of Port Angeles with no other turns (see Figure 3-5). Trucks on this route would avoid much of area identified as being of potential concern in Section 3.1.2.8 and would be expected to have very minor effects on normal traffic flow. Probably of more importance is the fact that biomass source areas in central and eastern portions of the Olympic Peninsula would access Port Townsend from the south and would not involve transport through Port Angeles. Given the amount of forest area accessible from this direction, it is unlikely that a significant amount of delivery traffic would come from the west through Port Angeles. Increased traffic that would be associated with the project in the Shelton area would not be expected to be cumulative with traffic associated with Nippon's proposed project.

Air Quality

The dominant wind direction in Port Angeles is from the west, following the Strait of Juan de Fuca (Nippon 2011), so under most weather conditions there would be no potential for air emissions from the Port Townsend facility to have cumulative effects on air quality conditions in Port Angeles. The reverse would not be true, since air emissions from Nippon's proposed project would normally move eastward toward Port Townsend. However, modeling of air emissions for the proposed project shows that normal dispersion of air pollutants quickly decreases air concentrations so that any additions at a distance of 30 miles would be very small. ORCAA and the State of Washington Department of Ecology are the permitting agencies for the identified biomass projects. Their decisions to grant air permits are based on evaluations that show each proposed air emission source, in combination with other sources, will not result in a violation of ambient air quality standards, which are the most reasonable, available measure of whether there would be adverse impacts to human health or the environment.

Biological Resources – Biomass Sources

The identified biomass projects, if completed, may all be considering the same general areas for sources of biomass feedstock. The State's initiative to promote biomass as a renewable energy source likely helped foster each of the identified projects and will likely continue to foster future projects. It is anticipated that these projects would have a cumulative effect on increasing the demand for biomass. Nippon's selection by DNR as a biomass-to-energy pilot project (Section 3.1.2.4) provides some security for Nippon should biomass availability become an issue. As part of being selected, DNR intends to enter into a long-term contract with Nippon for forest biomass from DNR-managed lands on the Olympic Peninsula. As a result, should cumulative demands for biomass ever adversely affect its availability, the viability of the Nippon proposed project would likely be impacted less than most other biomass users.

As described in Section 3.1.2.4, opponents of the State's biomass initiative have indicated a concern that removing these materials negatively impacts the forest's ecosystem because such activity removes organic materials that are essential to forest health. A logical extension of this concern might be that the more demand there is for biomass materials, the greater the potential to negatively impact the forest's ecosystem. DOE believes the actions being pursued by DNR (also discussed in Section 3.1.2.4) will minimize the potential for this type of adverse impact to occur. By definition, the forest biomass materials are residues from logging and other forest activities. From both an economic and forest management perspective it is unlikely that an increase in biomass demand will drive the forest activities. That is, for example, it is reasonable to assume that the value of timber will always greatly outweigh the value of the biomass residues and demand for biomass will not result in more logging. It is DNR's objective to establish criteria on how biomass collection is to be performed and what is to be left behind to maintain the health of the forest ecosystem and DNR has already taken action to require biomass collection to be done under a permit system to ensure the criteria are met.

5. REFERENCES

BEA (Bureau of Economic Analysis) 2010a. "Table CA25N-Total Full-Time and Part-Time Employment by NAICS Industry, Clallam County Washington 2008." April 2010. U.S. Department of Commerce, Washington, D.C. http://www.bea.gov/regional/reis/ (accessed January 6, 2011).

BEA (Bureau of Economic Analysis) 2010. B"Table CA1-3 Personal Income, Washington, 2008." April 2010. U.S. Department of Commerce, Washington, D.C. http://www.bea.gov/regional/reis/ (accessed January 13, 2011).

BEA (Bureau of Economic Analysis) 2010c. "Table CA1-3 Per Capita Personal Income, Washington 2008." April 2010. U.S. Department of Commerce, Washington, D.C. http://www.bea.gov/regional/reis/ (accessed January 6, 2011).

BLS (Bureau of Labor Statistics) 2010a. "Table 1. Incidence rates of nonfatal occupational injuries and illnesses by industry and case types, 2009." http://www.bls.gov/iif/ (accessed January 19, 2011).

BLS (Bureau of Labor Statistics) 2010. B"Table A-1. Fatal occupational injuries by industry and event or exposure, All United States, 2009." http://www.bls.gov/iif/ (accessed January 19, 2011).

BLS (Bureau of Labor Statistics) 2010c. "Local Area Unemployment Statistics, Clallam County Washington." U.S. Department of Labor, Washington, D.C. http://data.bls.gov/ (accessed January 7, 2011).

BLS (Bureau of Labor Statistics) 2010d. "Labor Force Statistics from the Current Population Survey, USA." U.S. Department of Labor, Washington, D.C. http://data.bls.gov/ (accessed January 7, 2011).

BPA (Bonneville Power Administration) 2010. "2009 BPA Facts." DOE/BP-4223. November. http://www.bpa.gov/corporate/pubs/ (accessed January 21, 2011).

Clallam County 2005. Elwha-Dungeness Watershed Plan, Water Resource Inventory Area 18 (WRIA 18) and Sequim Bay in West WRIA 17: Volume 1. May. http://www.clallam.net/environment/html/wria_18_watershed_plan.htm (accessed April 21, 2011).

CEQ (Council on Environmental Quality) 2010a. "Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions." February 18. Memorandum for Heads of Federal Departments and Agencies from Nancy H. Sutley, Chair, CEQ. http://www.whitehouse.gov/administration/eop/ceq/initatives/nepa (accessed May 9, 2011).

CEQ (Council on Environmental Quality) 2010b. Federal Greenhouse Gas Accounting and Reporting Guidance. October 6. http://www.whitehouse.gov/administration/eop/ceq/sustainability/fed-ghg (accessed May 9, 2011).

Colby, W.D.; Dobie, R.; Leventhall, G.; Lipscomb, D.M.; McCunney, R.J.; Seilo, M.T.; and Søndergaard, . 2009. Wind Turbine Sound and Health Effects: An Expert Panel Review, prepared for American Wind Energy Association and Canadian Wind Energy Association. http://www.awea.org/documents/AWEA_CanWEA_SoundWhitePaper_ExecSumm.pdf

DFW (Washington State Department of Fish and Wildlife) 2008. *Priority Habitats and Species List*. August. http://wdfw.wa.gov/conservaton/phs/list (accessed March 12, 2011) with Appendix 2 county-by-county list at http://wdfw.wa.gov/publications/00165/2010_distribution_county.xls (accessed March 12, 2011).

DOE (U.S. Department of Energy) 2000. *Clean Air Act General Conformity Requirements and the National Environmental Policy Act Process*. April. U.S. Department of Energy, Environment, Safety and Health Office of NEPA Policy and Assistance, Washington, D.C.

DOE (U.S. Department of Energy) 2006. Memorandum. Office of NEPA Policy and Compliance. Need to Consider Intentional Destruction Acts in NEPA Documents. December 1.

DOE (U.S. Department of Energy) 2011a. "Voluntary Reporting of Greenhouse Gases Program – Emission Factors and Global Warming Potentials – Fuel Emission Factors (From Appendix H of the instructions to Form EIA-1605)." Energy Information Administration. http://www.eia.gov/oiaf/1605/emission_factors.html (accessed April 28, 2011).

DOE (U.S. Department of Energy) 2011b. "Washington – State Energy Profile." Energy Information Administration. http://www.eia.gov/state/state_energy_profiles.cfm?sid=WA (accessed January 22, 2011).

DNR (Washington State Department of Natural Resources) 2008. *Habitat Conservation Plan for State Trust Lands – 2008 Annual Report*. November. Ecosystem Services Section, Land Management Division. http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/annual_reports.aspx (accessed May 9, 2011).

DNR (Washington State Department of Natural Resources) 2010a. "Forest Biomass Hot Topics." Factsheet FS-10-017 COG 9/10. http://www.dnr.wa.gov/ResearchScience/Topics/OtherConservationInformation/Pages/em_biomass.aspx (accessed January 7, 2011).

DNR (Washington Department of Natural Resources) 2010b. *Forest Biomass Initiative, Update to the 2011 Washington State Legislature.* December 2010. http://www.dnr.wa.gov/ResearchScience/Topics/OtherConservationInformation/Pages/em_biomass.aspx (accessed February 2, 2011).

DNR (Washington Department of Natural Resources) 2010c. "Forest Biomass HOT Topics" (Fact Sheet). FS-10-017 COG 9/10. http://www.dnr.wa.gov/ResearchScience/Topics/OtherConservationInformation/Pages/em_biomass.aspx (accessed February 2, 2011).

DNR (Washington State Department of Natural Resources) 2010d. *Trust Lands Habitat Conservation Plan – 2010 Annual Report*. December. http://www.dnr.wa.gov/ResearchScience/Topics/TrustLandsHCP/Pages/annual_reports.aspx (accessed May 9, 2011).

Ecology (State of Washington Department of Ecology) 2009. *Health Effects and Economic Impacts of Fine Particulate Pollution in Washington*. Washington State Department of Ecology, Air Quality Program, December 15. Publication number: 09-02-021. http://www.ecy.wa.gov/biblio/air2009.html (accessed April 20, 2011).

Ecology (State of Washington Department of Ecology) 2010. "Industrial Section – Port Townsend Paper Corporation." Updated November 17. http://www.ecy.wa.gov/programs/swfa/industrial/pulp_porttown.html (accessed February 3, 2011).

Ecology (State of Washington Department of Ecology) 2011. "RE: Federal Consistency – Biomass Cogeneratoin Facility Project." Letter from B. McFarland, Section Manager, Environmental Review and Transportation Section, Shorelands and Environmental Assistance Program, to T. Smith, Nippon Paper Industries USA Co. Ltd. April 22.

EPA (U.S. Environmental Protection Agency) 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. 550/0-74-004. March. U.S. Environmental Protection Agency, Office of Noise Abatement and Control.

EPA (U.S. Environmental Protection Agency) 2003. *AP 42, Fifth Edition, Volume 1, Chapter 1: External Combustion Sources – Section 1.6 Wood Residue Combustion in Boilers*. September. http://www.epa.gov/ttn/chief/ap42/ch01/index.html (accessed May 9, 2011).

EPA (U.S. Environmental Protection Agency) 2008. *Catalog of CHP Technologies – U.S. Environmental Protection Agency Combined Heart and Power Partnership*. December. http://www.epa.gov/chp/publications/index.html (accessed January 7, 2011).

EPA (U.S. Environmental Protection Agency) 2009a. "AirData, County Air Quality Report – Criteria Pollutants." Geographic Area: Washington. Year: 2008. http://www.epa.gov/air/data/geosel.html (accessed January 12, 2011).

EPA (U.S. Environmental Protection Agency) 2009. "AirData, Emissions by Category Report – Criteria Pollutants." Geographic Area: Clallam Co, WA. Pollutant: (1) Carbon Monoxide, (2) Nitrogen Oxides, (3) Sulfur Dioxide, (4) Volatile Organic Compounds, (5) Particles < 2.5 micrometers diameter, and (6) Particles < 10 micrometers diameter. Year: 2002. http://www.epa.gov/air/data/geosel.html (accessed January 12, 2011).

EPA (U.S. Environmental Protection Agency) 2009c. "AirData, County Emissions Report – Hazardous Air Pollutants." Geographic Area: Clallam Co, WA. Pollutant: Lead Compounds. Year: 2002. http://www.epa.gov/air/data/geosel.html (accessed January 15, 2011).

EPA (U.S. Environmental Protection Agency) 2010a. "Clean Air Act Permitting for Greenhouse Gases: Guidance and Technical Information – FACT SHEET." http://www.epa.gov/nsr/ghgpermitting.html (accessed February 2, 2011).

EPA (U.S. Environmental Protection Agency) 2010b. "Green Book, Nonattainment Status for Each County by Year for Washington." Listed by County, Pollutant then Area, as of December 17, 2010. http://www.epa.gov/oar/oaqps/breenbk/anay_wa.html (accessed January 12, 2011).

EPA (U.S. Environmental Protection Agency) 2010c. "eGrid2010 Version 1.0 Year 2007 GHG Annual Output Emission Rates." http://www.epa.gov/egrid (accessed April 29, 2011).

EPA (U.S. Environmental Protection Agency) 2011a. "News Release – EPA to Defer GHG Permitting Requirements for Industries that Use Biomass/Three-year deferral allows for further examination of scientific and technical issues associated with counting these emissions." Release date: 01/12/2011. http://www.yosemite.epa.gov/opa/admpress.nsf/0/4369C709163915B485257816005971BB (accessed February 2, 2011).

EPA (U.S. Environmental Protection Agency) 2011b. "Proposed Rule – Deferral for CO2 Emissions from Bioenergy and Other Biogenic Sources under the Prevention of Significant Deterioration (PSD) and Title V Programs – FACT SHEET." http://www.epa.gov/NSR/actions.html (accessed May 9, 2011).

FEMA (Federal Emergency Management Agency) 1990. "FIRM – Flood Insurance Rate Map – City of Port Angeles, Washington, Clallam County," Community-Panel Number 530023 0002 C. Map Revised: September 28, 1990. http://www.fema.gov/hazard/map/index.shtm (accessed on January 6, 2011).

HUD (U.S. Department of Housing and Urban Development) 2009. *The Noise Guidebook*. United States Department of Housing and Urban Development. Washington, D.C.

IPCC (Intergovernmental Panel on Climate Change) 2007. *Climate Change 2007; Synthesis Report*. Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Core Writing Team: Pachauri, R.K., and Reisinger, A. (eds.). International Panel on Climate Change, Geneva, Switzerland. http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf (accessed March 12, 2011).

Mapes, Lynda V. 2009. *Breaking Ground: The Lower Elwha Klallam Tribe and the Unearthing of Tse-whit-sen Village*. University of Washington Press, Seattle and London.

Nippon (Nippon Paper Industries USA Co., Ltd.) 2011. *Notice of Construction Application for the New Biomass-Fired Fuel Boiler*. Submitted to the Olympic Region Clean Air Agency August 2010, revised February 2011. Prepared by CH2MHill. http://www.orcaa.org/news/biomass-projects/nippon-paper-industries/ (accessed February 28, 2011).

NPS (National Park Service, U.S. Department of the Interior) 2005. *Elwha River Ecosystem Restoration Implementation, Final Supplement to the Final Environmental Impact Statement.* July 2005. http://www.nps.gov/olym/naturescience/elwha-restoration-docs.htm (accessed January 23, 2011).

NPS (National Park Service, U.S. Department of the Interior) 2010. "Olympic National Park, Water Treatment – Overview." http://www.nps.gov/olym/naturescience/water-treatment-overview.htm (accessed January 5, 2011).

NPS (National Park Service, U.S. Department of the Interior) 2011. "Olympic National Park, Frequently Asked Questions." http://www.nps.gov/olym/naturescience/elwha-faq.htm (accessed January 23, 2011).

ORCAA (Olympic Region Clean Air Agency) 2011a. "Re: NOC Application Status, 10NOC763." Letter dated March 4, 2011 from G. L. Glass, ORCAA Air Quality Engineer , to P. Perlwitz, Nippon Paper Industries USA.

ORCAA (Olympic Region Clean Air Agency) 2011b. "Home – Current Biomass Projects." http://www.orcaa.org (accessed February 3, 2011).

ORCAA (Olympic Region Clean Air Agency) 2011c. "Adage Withdraws NOC Application." Posted on March 28, 2011. http://news.orcaa.org/2011/03/adage-withdraws/ (accessed May 10, 2011).

ORCAA (Olympic Region Clean Air Agency) 2011d. "Solomon Renewable Energy Co." http://www.orcaa.org/news/biomass-projects/solomon-renewable-energy-co/ (accessed February 3, 2011).

ORCAA (Olympic Region Clean Air Agency) 2011e. "Staff Recommendation for Notice of Construction 10NOC763." Applicant: Nippon Paper Industries USA Co. Ltd. April 15. http://www.orcaa.org/public-involvement/staff-recommendations/ (accessed April 20, 2011).

Peninsula Daily News 2010a. "Planning Commission OKs permits for Nippon biomass cogeneration plant." September 23. http://www.peninsuladailynews.com/apps/pbcs.dll/article?AID=2010309239987 (accessed January 29, 2011).

Peninsula Daily News 2010. "Environmental coalition appeals Nippon biomass project approvals." October 6. http://www.peninsuladailynews.com/apps/pbcs.dll/article?AID=2010310069978 (accessed January 29, 2011).

Peninsula Daily News 2010c. "Port Angeles City Council upholds Nippon's biomass shoreline permit." December 7. http://www.peninsuladailynews.com/apps/pbcs.dll/article?AID=2010312079992 (accessed January 29, 2011).

Peninsula Daily News 2010d. "Coalition files appeal of Port Townsend mill biomass permit." November 26. http://www.peninsuladailynews.com/apps/pbcs.dll/article?AID=2010311269997 (accessed January 29, 2011).

Peninsula Daily News 2011. "State appeal filed against Nippon biomass plan; foes await summer hearing on Port Townsend mill biomass upgrade." January 20. http://www.peninsuladailynews.com/apps/pbcs.dll/article?AID=2011301209982 (accessed January 29, 2011).

Perlwitz, P. 2011a. "Update to DOE EA Water." Email from P. Perlwitz, Nippon Environmental Manager to T. Smith, Nippon Environmental Coordinator. February 25.

Perlwitz. P. 2011b. "RE: Nippon EA – Air Quality Comment." Email from P. Perlwitz, Nippon Environmental Manager to K. Davis, Jason Associates Corporation. March 11.

Perlwitz, P. 2011c. "RE: Nippon Draft EA." Email from P. Perlwitz, Nippon Environmental Manager, to K. Davis, Jason Associates Corporation, February 11.

Port Angeles (City of Port Angeles, Washington) 2010a. *Nippon Paper Industries USA Co., Ltd. Biomass Cogeneration Facility Project Final SEPA Environmental Impact Statement.* September 3. http://www.cityofpa.us/PDFs/CommEconDev.htm#nIP (accessed February 25, 2011).

Port Angeles (City of Port Angeles, Washington) 2010. B*The Comprehensive Plan for the City of Port Angeles.* Amended June 24, 2010. September 3. http://www.cityofpa.us/comDevCompPlan.htm (accessed January 18, 2011).

Port Angeles (City of Port Angeles, Washington) 2010c. "2009 Consumer Confidence Water Quality Report. June. From Port Angeles Water Superintendent. http://www.cityofpa.us/pwWaterU.htm (access January 22, 2011).

Port Angeles (City of Port Angeles, Washington) 2011a. "Waste Water Utility, Public Works & Utilities Department – Wastewater Utility (Sewer)." http://www.cityofpa.us/pwWasteWtr.htm (accessed January 21, 2011).

Port Angeles (City of Port Angeles, Washington) 2011. B"Electric Utility, Accommodating Energy Needs." http://www.cityofpa.us/pwEUtil.htm (accessed January 21, 2011).

PTPC (Port Townsend Paper Corporation) 2011. "Port Townsend Paper – Environment – Sustainability – Biomass Cogeneration Project." http://www.ptpc.com/environment.html (accessed February 4, 2011).

Seattle Times 2005. "Unearthing Tse-whit-zen, a Seattle Times special report, May 22 – May 25, 2005." http://seattletimes.nwsource.com/news/local/klallam/ (accessed January 17, 2011).

SEI (Stockholm Environment Institute) 2010. *Greenhouse gas and air pollutant emissions of alternatives for woody biomass residues – Final Draft Version 2.0*. November. http://www.orcaa.org/woody-biomass-emissions-study/ (accessed May 9, 2011).

SHB (State of Washington Shorelines Hearing Board) 2011. *SHB No. 11-004, Order Granting Summary Judgment*. No Biomass Burn; Port Townsend Air Watchers; World Temperate Rainforest Network; Olympic Environmental Council; Olympic Forest Coalition; and Sierra Club, Washington State Chapter, Petitioners, v. City of Port Angeles and Nippon Paper Industries USA Co. LTD, Respondents. April 26. http://www.eho.wa.gov/Decisions.aspx (accessed May 20, 2011).

Smith, T. 2011a. "RE: Nippon's Public Outreach." Email from T. Smith, Nippon Environmental Coordinator, to J. Rivers, Jason Associates Corporation. January 6.

Smith, T. 2011b. "FW: Nippon Figure 2-2 for review." Email from T. Smith, Nippon Environmental Coordinator, to K. Davis, Jason Associates Corporation. February 4.

Smith, T. 2011c. "RE: Questions on Nippon EA." Email from T. Smith, Nippon Environmental Coordinator, to K. Davis, Jason Associates Corporation. February 1.

Smith, T. 2011d. "RE: Additional Questions for EA Preparation." Email from T. Smith, Nippon Environmental Coordinator, to J. Rivers, Jason Associates Corporation. January 13.

Smith, T. 2011e. "FW: Nippon Draft EA – Cooling Towers." Email from T. Smith, Nippon Environmental Coordinator, to K. Davis, Jason Associates Corporation. February 28.

Smith, T. 2011f. "RE: Nippon EA – Air Quality Comment." Email from T. Smith, Nippon Environmental Coordinator, to K. Davis, Jason Associates Corporation. March 11.

USCB (U.S. Census Bureau) 2003a. "County to County Worker Flow Files for Washington, Sorted by Worksite State and County." U.S. Department of Commerce, Washington, D.C. March 6, 2003. http://www.census.gov/population/ (accessed January 7, 2011).

USCB (U.S. Census Bureau) 2003. "County to County Worker Flow Files for Washington, Sorted by Resident State and County." U.S. Department of Commerce, Washington, D.C. March 6. http://www.census.gov/population/ (accessed January 7, 2011).

USCB (U.S. Census Bureau) 2010a. "State and County QuickFacts, Washington and Clallam County, Washington." U.S. Department of Commerce, Washington, D.C. April. http://quickfacts.census.gov/ (accessed January 6, 2011).

USCB (U.S. Census Bureau) 2010. "Population Finder, Port Angeles Town, Clallam County Washington." U.S. Department of Commerce, Washington, D.C. http://factfinder.census.gov/ (accessed January 7, 2011).

USFWS (U.S. Fish and Wildlife Service) 2010. "Listed and Proposed Endangered and Threatened Species and Critical Habitat; Candidate Species; and Species of Concern in Clallam County as Prepared by the U.S. Fish and Wildlife Service Washington Fish and Wildlife Office." Revised August 26. http://www.fws.gov/wafwo/agencies.html (accessed January 16, 2011).

Ward, L., P. Crain, B. Freymond, M. McHenry, D. Morrill, G. Pess, R. Peters, J.A. Shaffer, B. Winter, and B. Wunderlich. 2008. *Elwha River Fish Restoration Plan-Developed Pursuant to the Elwha River Ecosystem and Fisheries Restoration Act, Public Law 102-495*. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-90, 168 p. http://www.nwfsc.noaa.gov/publications/displayinclude.cfm?incfile=technicalmemorandum2008.inc (accessed May 5, 2011).

Washington 2009. "Washington's Application to the United States Department of Energy, State Energy Program, American Recovery and Reinvestment Act 2009." May. Prepared by the State of Washington, Department of Community, Trade and Economic Development (now the Department of Commerce). http://www.commerce.wa.gov/site/1164/default.aspx (accessed January 6, 2011).

6. AGENCIES AND PERSONS CONSULTED

Name	Organization
State of Washington Department of Archaeology and Historic Preservation	
Brooks, Allyson	Agency Director and SHPO
Whitlam, Rob	State Archaeologist
State of Washington Department of Commerce	
Plantenberg, Cory	State Energy Office, Program Manager
Lower Elwha Klallam Tribe	
Charles, Frances	Tribal Chairwoman
Hepfer, Russell	Tribal Council Vice Chairman
Charles, Anthony	Tribal Council Member
Johnson, Ed	Tribal Council Member
Bierne, Matt	Tribal Environmental Coordinator
White, Bill	Tribal Archaeologist
Nippon Paper Industries USA Co.	
Perlwitz, Paul	Environmental Manager
Holmquist, Gary	Cogeneration Project, Project Manager
Smith, Tami	Environmental Coordinator
Backer, Tom	Attorney
Miss, Chris	Northwest Archaeological Associates, Archaeological Consultant

APPENDIX A:
DISTRIBUTION LIST

The Honorable Chris Gregoire
Governor of Washington
Office of the Governor
416 14th Avenue, SW, Suite 200
PO Box 40002
Olympia, WA 98504-0002

Ms. Annie Szvetecz, SEPA Policy Lead
Washington Department of Ecology
PO Box 47703
Olympia, WA 98504-7703
annie.szvetecz@ecy.wa.gov
sepaunit@ecy.wa.gov (submissions)

State of Washington
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Francea L. McNair, Executive Director
Olympic Region Clean Air Agency
2940-B Limited Lane NW
Olympia, WA 98502

Dr. Allyson Brooks
State Historic Preservation Officer
State of Washington Department of
Archaeology and Historic Preservation
P.O. Box 48343
Olympia, WA 98504-8343
Allyson.Brooks@dahp.wa.gov

Dr. Rob Whitlam, State Archaeologist
State of Washington Department of
Archaeology and Historic Preservation
P.O. Box 48343
Olympia, WA 98504-8343
mailto:mRob.Witlam@dahp.wa.gov

Olympic National Park
Attn: Karin Gustin, Superintendent
600 E. Park Avenue
Port Angeles, WA 98362
mailto:mKaren_Gustin@nps.gov

Ms. Cory Plantenberg
Energy Program Manager
Energy Policy Division
Washington Department of Commerce
906 Columbia St. SW
PO Box 43173
Olympia, WA 98504-3173
cory.plantenberg@commerce.wa.gov

Rachael Jamison
Washington State Department of Natural
Resources
1111 Washington Street SE, MS 47001
Olympia, WA 98504
mailto:mRachael.jamison@dnr.wa.gov

Nathan West, Director
Community and Economic Development
City of Port Angeles
321 East 5th Streeet
P.O. Box 1150
Port Angeles, WA 98362
smartgrowth@cityofpa.us

Mr. Jim Michaels, Manager
Conservation and Hydropower Planning
Division
Washington Fish and Wildlife Office
U.S. Fish and Wildlife Service
510 Desmond Drive, S.E., Suite 102
Lacey, Washington 98503-1273

Mark Carey, Mitigation Division Director
Region X, FEMA
Federal Regional Center
130 – 228th Street, Southwest
Bothell, WA 98021-8627

Maria Lopez
Tribal Chairperson, Hoh Indian Tribe
P.O. Box 2196
Forks, WA 98331

William Ron Allen
Tribal Chairman
Jamestown S'Klallam Tribe
1033 Old Blyn Highway
Sequim, WA 98382
rallen@jamestowntribe.org

Kathleen Duncan
Enrollment Officer/Cultural Resource Spec.
Jamestown S'Klallam Tribe
1033 Old Blyn Highway
Sequim, WA 98382

Francis G. Charles
Tribal Chairwoman
Lower Elwha Klallam Tribe
2851 Lower Elwha Road
Port Angeles, WA 98363

William S. White, MA
Cultural Resource Archeologist
Lower Elwha Klallam Tribe
2851 Lower Elwha Road
Port Angeles, WA 98363

Michael J. Lawrence, Tribal Chairman
Makah Tribe
P.O. Box 115
Neah Bay, WA 98357-0115

Janine Bowechop
Tribal Historic Preservation Officer
Makah Tribe
P.O. Box 115
Neah Bay, WA 98357-0115

Jerome C. Sullivan
Tribal Chairman
Port Gamble S'Klallam Tribe
31912 Little Boston Road, NE
Kingston, WA 98346

Anna R. Counsell-Geyer
Tribal Chairperson, Quileute Tribe
P.O. Box 279
La Push, WA 98350

Harry Smiskin
Tribal Chairman
Confederated Tribes and Bands of the
Yakama Nation
P.O. Box 151
Toppenish, WA 98948-0151

V. Kate Valdez
Tribal Historic Preservation Officer
Confederated Tribes and Bands of the
Yakama Nation
P.O. Box 151
Toppenish, WA 98948-0151

Darlene Schanfald
Olympic Environmental Council
P.O. Box 2664
Sequim, WA 98382
darlenes@olympus.net

Gretchen Brewer, Director
PT AirWatchers
P.O. Box 1653
Port Townsend, WA 98368
mailto:mptairwatchers@mailhaven.com

Rachael Paschal Osborn, Executive Director
Center for Environmental Law and Policy
25 W. Main, Suite 234
Spokane, WA 99201
rosborn@celp.org

Duff Badgley
No Biomass Burn
1900 W. Nickerson St., #116
Seattle, WA 98119
duff@nobiomassburn.org

Josey Paul, Chair
North Olympic Sierra Club
P.O. Box 44
Joyce, WA 98343

Shirley Nixon
P.O. Box 178
Port Angeles, WA 98362
shirleynixon@olympus.net

Norman T. Baker, PhD
3789 Lost Mountain Rd
Sequim, WA 98382
mailto:mntbakerphd@earthlink.net

Bob Lynette, Co-Chair
North Olympic Group of the Sierra Club
P.O. Box 714
Carlsborg, WA 98324
mailto:mwindenergy@olypen.com

Mary S. Booth, PhD
Partnership for Policy Integrity
New York University School of Law
Wilf Hall
139 MacDougal Street, Third Floor
New York, NY 10012
mailto:mmbooth@pfpi.net

Phyllis Snyder
1327 Hudson St. #1
Port Townsend, WA 98368

Norma Turner
3928 Mt Angeles Road
Port Angeles, WA 98362
mailto:mnormagene@olympus.net

Sarah Uhlemann, Staff Attorney
Center for Biological Diversity
P.O. Box 31001
Seattle, WA 98103-9998
mailto:mshlemann@biologicaldiversity.org

Margaret E. Sheehan, Esq., President
Biomass Accountability Project
P.O. Box 380083
Cambridge, MA 02238
mailto:mmeg@ecolaw.biz

Bob Lynette
220 Strawberry Field Drive
Sequim, WA 98382

Janet Marx
mailto:mJanetmarx_76@msn.com

Teri Wright
twright57e@yahoo.com

Pat Rasmussen
World Temperate Rainforest Network
mailto:mpatr@crcwnet.com