CONFORM AND RETURN

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STATE OF WASHINGTON
KITSAP COUNTY SUPERIOR COURT

STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, Plaintiff, v. POPE RESOURCES LP, OPG PROPERTIES LLC. Defendants.	NO. 13 2 02720 0 CONSENT DECREE PORT GAMBLE BAY

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ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

I. INTRODUCTION

A. A mutual objective of the State of Washington, Department of Ecology (Ecology), and Pope Resources LP (PR) and OPG Properties LLC (OPG) (collectively Defendants) under this Consent Decree (Decree) is to provide for remedial action at a portion(s) of the facility (the "Property" defined below) where there has been a release or threatened release of hazardous substances. As more fully described in the attached Cleanup Action Plan (CAP) (Exhibit A), this Decree requires Defendants to remove all pilings and overwater structures, perform intertidal excavation and backfilling, subtidal dredging, capping and enhanced monitored natural recovery, and monitored natural recovery; implement institutional controls on the Property; and provide for compliance monitoring of the cleanup actions implemented on the Property. The Decree also requires Defendants to maintain sufficient and adequate financial assurance mechanisms to cover all costs associated with the operation and maintenance of the remedial action on the Property. The actions are expected to constitute the final cleanup for the Property. Ecology has determined that the remedial actions required under this Decree are necessary to protect human health and the environment.

The Parties anticipate that to the extent further remedial actions are required under the Model Toxics Control Act (MTCA), RCW 70.105D, at the remainder of the Site, such actions will be performed under a separate order and/or amendment to this Decree and CAP to address releases or threatened releases of hazardous substances including chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans. Notwithstanding the foregoing, if the Parties are unable to reach agreement on any amendments to the Decree that incorporate all or portions of the remainder of the Site, the failure to reach agreement on any such amendments shall not in any way impact the finality of this Decree or delay (i) the dismissal of this Decree by the Court and (ii) Ecology's notification under Section XXVIII (Duration of Decree) that the requirements of this Decree have been satisfactorily completed.

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

In the event this Decree terminates before it is amended to include all or portions of the remainder of the Site, the Parties agree to work collaboratively and in good faith towards a separate consent decree for all or portions of the remainder of the Site.

B. The Complaint in this action is being filed simultaneously with this Decree. An Answer has not been filed, and there has not been a trial on any issue of fact or law in this case. However, the Parties wish to fully resolve issues concerning the Property that are raised by Ecology's Complaint. In addition, the Parties agree that settlement of these matters without litigation is reasonable and in the public interest, and that entry of this Decree is the most appropriate means of resolving these matters.

C. By signing this Decree, the Parties agree to its entry and agree to be bound by its terms.

D. By entering into this Decree, the Parties do not intend to discharge non-settling parties from any liability they may have with respect to matters alleged in the Complaint. The Parties retain the right to seek reimbursement, in whole or in part, from any non-settling liable persons for sums expended under this Decree.

E. This Decree shall not be construed as proof of liability or responsibility for any releases of hazardous substances or cost for remedial action, nor an admission of any facts; provided, however, that the Defendants shall not challenge the authority of the Attorney General and Ecology to enforce this Decree.

F. The Court is fully advised of the reasons for entry of this Decree, and good cause having been shown:

Now, therefore, it is HEREBY ORDERED, ADJUDGED, AND DECREED as follows:

The foregoing Section I (Introduction) shall be incorporated into this Decree as if fully set forth herein.

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

II. JURISDICTION

A. This Court has jurisdiction over the subject matter and over the Parties pursuant to the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

B. Authority is conferred upon the Washington State Attorney General by RCW 70.105D.040(4)(a) to agree to a settlement with any potentially liable person (PLP) if, after public notice and any required hearing, Ecology finds the proposed settlement would lead to a more expeditious cleanup of hazardous substances. RCW 70.105D.040(4)(b) requires that such a settlement be entered as a consent decree issued by a court of competent jurisdiction.

C. Ecology has determined that a release or threatened release of hazardous substances has occurred at the Site, a portion of which is the subject of this Decree.

D. Ecology has given notice to the Defendants of Ecology's determination that Defendants are among the PLPs for the Site, as required by RCW 70.105D.020(26) and WAC 173-340-500.

E. The actions to be taken pursuant to this Decree are necessary to protect public health and the environment.

F. This Decree has been subject to public notice and comment, and a public hearing was held on October 29, 2013.

G. Ecology finds that this Decree will lead to a more expeditious cleanup of hazardous substances at a portion of the Site in compliance with the cleanup standards established under RCW 70.105D.030(2)(e) and Chapter 173-340 WAC.

H. Defendants have agreed to undertake the actions specified in this Decree and consent to the entry of this Decree under MTCA.

III. PARTIES BOUND

This Decree shall apply to and be binding upon the Parties to this Decree, their successors and assigns. The undersigned representative of each party hereby certifies that he or she is fully authorized to enter into this Decree and to execute and legally bind such party to

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

comply with this Decree. Defendants agree to undertake all actions required by the terms and conditions of this Decree. No change in ownership or corporate status shall alter the Defendants' responsibility under this Decree. Defendants shall provide a copy of this Decree to all agents, contractors, and subcontractors retained to perform work required by this Decree, and shall ensure that all work undertaken by such agents, contractors, and subcontractors complies with this Decree.

IV. DEFINITIONS

Unless otherwise specified herein, all definitions in RCW 70.105D.020 and WAC 173-340-200 shall control the meanings of the terms in this Decree.

A. Cleanup Action Plan or CAP: Refers to the Cleanup Action Plan (CAP) (Exhibit A) issued by Ecology relating to the Property and all attachments to the CAP.

B. Consent Decree or Decree: Refers to this Consent Decree and each of the exhibits to this Decree. All exhibits are integral and enforceable parts of the Decree. The terms "Consent Decree" or "Decree" shall include all exhibits to this Consent Decree.

C. Days: Shall mean calendar days. The date of the event from which a time period begins to run shall not be included in computing the time period. The last day of a period so computed shall be included in the period unless it is a Saturday, Sunday, or legal holiday recognized by the State of Washington, in which case the period extends to the end of the next calendar day which is not a Saturday, Sunday, or legal holiday recognized by the State of Washington.

D. Defendants: Refers to PR and OPG.

E. Mill: Mill shall mean the portion of the upland area where the sawmill was located.

F. Parties: Refers to Ecology and PR/OPG.

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Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

G. Potentially Liable Persons (PLPs): Refers to PR and OPG. Ecology has given notice to Washington State Department of Natural Resources (DNR) of Ecology's determination that it is a PLP for the Site, but DNR has chosen not to be a party to this Decree.

H. Property: Refers to the northwest, middle and southern portions of Port Gamble Bay (also referred to as "the Bay") up to the ordinary high water mark. The Property is more particularly described in the Site and Property diagram attached as Exhibit B to this Decree.

I. Site: The Site is referred to as the Port Gamble Bay and Mill Site and consists of the Property together with the former sawmill area, and uplands areas to the west and south of the former sawmill area, all of which are generally located near the eastern terminus of NE View Drive in Port Gamble, Washington, as well as wherever hazardous substances from releases at these areas have come to be located. The Site has not yet been fully defined but is generally depicted in Exhibit B. The Site constitutes a Facility under RCW 70.105D.020(8).

V. FINDINGS OF FACT

Ecology makes the following findings of fact, without any express or implied admissions of such facts by the Defendants:

A. Ownership and Operation of the Site

1. PR and the State currently own different portions of the Property. PR owns the tidelands extending waterward to the extreme low tide line. The State owns the bedlands from the extreme low tide throughout the Bay to the center of the Bay. The Property is commonly referred to as Port Gamble Bay. The location of the Property is indicated on Exhibit B.

2. In 1985, Pope & Talbot, Inc. (P&T) transferred ownership of the sawmill, uplands and adjacent tidelands to PR. P&T continued wood products manufacturing at the Site until 1995 under a lease with PR.

3. OPG, formerly known as Olympic Property Group LLC, was formed in 1998 to manage PR's real estate in Kitsap County and presently operates portions of the Site including areas that it leases and that contain property improvements.

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Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

B. Releases of Hazardous Substances

1. Between 1853 and 1995, the Site was used as a forest products manufacturing facility by P&T and/or its corporate predecessors. Contamination at the Site is related to use of sawmill buildings to saw logs for lumber, operation of two chip barge loading facilities and a log-transfer facility, sawmill emissions of particulates from burning of wood and wood waste, and in-water log rafting and storage areas. In the late 1920s, one of the chip barge loading facilities was installed on the north end of the sawmill (the northern embayment). During the mid-1970s, an additional chip barge loading facility (the alder mill) was constructed at the southeast portion of the sawmill. Logs were generally stored, rafted, and sorted in-water throughout the Bay. The 72 acre in-water log rafting area along the western shore of the Bay was leased by DNR to P&T in several consecutive leases from 1974 to 2001, but terminated in 1996 at P&T's request. Contamination is also related to creosote treated pilings that P&T and its predecessors placed throughout the Bay to facilitate storage and transport of logs and wood products, and large accumulations of wood waste covering portions of the Bay.

2. Activities at the Site resulted in releases of hazardous substances at the Property. Hazardous substances released included cadmium, carcinogenic polynuclear aromatic hydrocarbons (cPAHs), dioxin/furans, and toxicity associated with wood waste and its breakdown products including phenols, resin acids, and total and dissolved sulfides. These releases of hazardous substances at the Property present a threat to human health and the environment and require remedial action.

C. Previous Remedial Actions at the Property

1. Between 1995 and 2008, Defendants and P&T carried out a series of independent interim remedial actions in the Bay. These actions included investigations of the extent of contamination including accumulation of wood waste. In 2003, 13,500 cubic yards of wood debris were dredged from a 1.8-acre area containing bark and wood chips. Ecology

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

dredged 17,500 cubic yards of wood waste in an area adjacent to the 2003 dredging area and placed a 6 inch layer of clean sand over a portion of the newly-dredged area.

2. Effective May 8, 2008, Ecology and Defendants entered into Agreed Order No. DE 5631, pursuant to which two focused Remedial Investigation and Feasibility Study Reports (RI/FS) for portions of the Site including the Mill and the Property were completed, submitted, and released for public comment in February and March 2011. In December 2012, based upon public comment, the reports were revised and combined into a Partial RI/FS (PRI/FS) that summarizes existing remedial investigation results for the Mill and the Bay and develops and evaluates remedial alternatives for the inwater portions of the Site. The conclusions of the PRI/FS form the bases for the cleanup action to be implemented in this Decree.

D. Contaminants of Concern and Site Ranking

The contaminants of concern at the Property that exceed MTCA cleanup levels are cadmium, cPAHs, dioxins/furans, wood waste, phenols, resin acids, and total and dissolved sulfides. These contaminants of concern are present in sediments. Ecology has assigned the Site an overall priority ranking of 2 pursuant to MTCA.

VI. WORK TO BE PERFORMED

This Decree contains a program designed to protect human health and the environment from the known release, or threatened release, of hazardous substances or contaminants at, on, or from the Property.

A. Defendants will implement the CAP and all attachments to the CAP, under the schedule provided for in the CAP. As more fully described in the CAP, the CAP provides for the following actions: removing all docks and overwater structures, pilings, performing intertidal excavation and backfilling, subtidal dredging, capping, enhanced monitored natural recovery, and monitored natural recovery; implementing institutional controls on the Property; and providing for compliance monitoring of the cleanup actions implemented on the Property.

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Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

B. Defendants agree not to perform any remedial actions outside the scope of this Decree unless the Parties agree to modify the CAP to cover these actions or Ecology otherwise authorizes such actions. All work conducted by Defendants under this Decree shall be performed in accordance with Chapter 173-340 WAC unless otherwise provided herein.

VII. DESIGNATED PROJECT COORDINATORS

The project coordinator for Ecology is:

Russ McMillan
Toxics Cleanup Program
PO Box 47600
Olympia, WA 98504-7600
(360) 407-7536

The project coordinator for Defendants is:

Clay Patmont
Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101
(206) 903-3324

Each project coordinator shall be responsible for overseeing the implementation of this Decree. Ecology's project coordinator will be Ecology's designated representative for the Site. To the maximum extent possible, communications between Ecology and Defendants and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Decree shall be directed through the project coordinators. The project coordinators may designate, in writing, working level staff contacts for all or portions of the implementation of the work to be performed required by this Decree.

Any party may change its respective project coordinator. Written notification shall be given to the other party at least ten (10) calendar days prior to the change.

VIII. PERFORMANCE

All geologic and hydrogeologic work performed pursuant to this Decree shall be under the supervision and direction of a geologist or hydrogeologist licensed by the State of

Washington or under the direct supervision of an engineer registered by the State of Washington, except as otherwise provided for by Chapters 18.220 and 18.43 RCW.

All engineering work performed pursuant to this Decree shall be under the direct supervision of a professional engineer registered by the State of Washington, except as otherwise provided for by RCW 18.43.130.

All construction work performed pursuant to this Decree shall be under the direct supervision of a professional engineer or a qualified technician under the direct supervision of a professional engineer. The professional engineer must be registered by the State of Washington, except as otherwise provided for by RCW 18.43.130.

Any documents submitted containing geologic, hydrologic, or engineering work shall be under the seal of an appropriately licensed professional as required by Chapters 18.220 and 18.43 RCW.

Defendants shall notify Ecology in writing of the identity of any engineer(s) and geologist(s), contractor(s) and subcontractor(s), and others to be used in carrying out the terms of this Decree, in advance of their involvement at the Site.

IX. ACCESS

Ecology or any Ecology authorized representative shall have full access to enter and freely move about the Property that Defendants either own, control, or have access rights to at all reasonable times for the purposes of, *inter alia*: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Decree; reviewing Defendants' progress in carrying out the terms of this Decree; conducting such tests or collecting such samples as Ecology may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Decree; and verifying the data submitted to Ecology by Defendants. Defendants shall make all reasonable efforts to secure access rights for those properties within the Property not owned or controlled by Defendants where remedial activities or investigations will be performed pursuant to this Decree. Ecology or any Ecology authorized representative shall give reasonable notice before

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

entering any property owned or controlled by Defendants unless an emergency prevents such notice. All Parties who access the Property pursuant to this section shall comply with any applicable health and safety plan(s). Ecology employees and their representatives shall not be required to sign any liability release or waiver as a condition of property access.

X. SAMPLING, DATA SUBMITTAL, AND AVAILABILITY

With respect to the implementation of this Decree, Defendants shall make the results of all sampling, laboratory reports, and/or test results generated by it or on its behalf available to Ecology. Pursuant to WAC 173-340-840(5), all sampling data shall be submitted to Ecology in both printed and electronic formats in accordance with Section XI (Progress Reports), Ecology's Toxics Cleanup Program Policy 840 (Data Submittal Requirements), *available at* http://www.ecy.wa.gov/programs/tcp/policies/pol840.pdf, and/or any subsequent procedures specified by Ecology for data submittal.

If requested by Ecology, Defendants shall allow Ecology and/or its authorized representative to take split or duplicate samples of any samples collected by Defendants pursuant to the implementation of this Decree. Defendants shall notify Ecology seven (7) days in advance of any sample collection or work activity at the Property. Ecology shall, upon request, allow Defendants and/or their authorized representative to take split or duplicate samples of any samples collected by Ecology pursuant to the implementation of this Decree, provided that doing so does not interfere with Ecology's sampling. Without limitation on Ecology's rights under Section IX (Access), Ecology shall notify Defendants prior to any sample collection activity unless an emergency prevents such notice.

In accordance with WAC 173-340-830(2)(a), all hazardous substance analyses shall be conducted by a laboratory accredited under Chapter 173-50 WAC for the specific analyses to be conducted, unless otherwise approved by Ecology.

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

XI. PROGRESS REPORTS

Defendants shall submit to Ecology written monthly Progress Reports that describe the actions taken during the previous month to implement the requirements of this Decree. The Progress Reports shall include the following:

A. A list of on-Property activities that have taken place during the month;

B. Detailed description of any deviations from required tasks not otherwise documented in project plans or amendment requests;

C. Description of all deviations from the CAP during the current month and any planned deviations in the upcoming month;

D. For any deviations in schedule, a plan for recovering lost time and maintaining compliance with the schedule;

E. All raw data (including laboratory analyses) received by Defendants during the past month and an identification of the source of the sample; and

F. A list of deliverables for the upcoming month if different from the schedule.

Unless otherwise specified, all Progress Reports shall be submitted by the tenth (10th) day of the month in which they are due after the effective date of this Decree. Unless otherwise specified, Progress Reports and any other documents submitted pursuant to this Decree shall be sent by certified mail, return receipt requested, to Ecology's project coordinator.

XII. RETENTION OF RECORDS

During the pendency of this Decree, and for ten (10) years from the date this Decree is no longer in effect as provided in Section XXVIII (Duration of Decree), Defendants shall preserve all records, reports, documents, and underlying data in its possession relevant to the implementation of this Decree and shall insert a similar record retention requirement into all contracts with project contractors and subcontractors. Upon request of Ecology, Defendants

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

shall make all records available to Ecology and allow access for review within a reasonable time.

Nothing in this Decree is intended by Defendants to waive any right they may have under applicable law to limit disclosure of documents protected by the attorney work-product privilege and/or the attorney-client privilege. If Defendants withhold any requested records based on an assertion of privilege, Defendants shall provide Ecology with a privilege log specifying the records withheld and the applicable privilege. No Property-related data collected pursuant to this Decree shall be considered privileged.

XIII. TRANSFER OF INTEREST IN PROPERTY

No voluntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Property shall be consummated by Defendants without provision for continued operation and maintenance of any containment system, treatment system, and/or monitoring system installed or implemented pursuant to this Decree.

Prior to Defendants' transfer of any interest in all or any portion of the Property, and during the effective period of this Decree, Defendants shall provide a copy of this Decree to any prospective purchaser, lessee, transferee, assignee, or other successor in said interest; and, at least thirty (30) days prior to any transfer, Defendants shall notify Ecology of said transfer. Upon transfer of any interest, Defendants shall notify all transferees of the restrictions on the activities and uses of the Property under this Decree and incorporate into or reference any such use restrictions in the transfer documents.

XIV. RESOLUTION OF DISPUTES

A. In the event a dispute arises as to an approval, disapproval, proposed change, or other decision or action by Ecology's project coordinator, or an itemized billing statement under Section XXIV (Remedial Action Costs), the Parties shall utilize the dispute resolution procedure set forth below.

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Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

1. Upon receipt of Ecology's project coordinator's written decision, or the itemized billing statement, Defendants have fourteen (14) days within which to notify Ecology's project coordinator in writing of its objection to the decision or itemized statement.

2. The Parties' project coordinators shall then confer in an effort to resolve the dispute. If the project coordinators cannot resolve the dispute within fourteen (14) days, Ecology's project coordinator shall issue a written decision.

3. Defendants may then request section management review of the decision. This request shall be submitted in writing to the Land and Aquatic Lands Cleanup Section, Toxics Cleanup Program Section Manager within seven (7) days of receipt of Ecology's project coordinator's written decision.

4. Ecology's Land and Aquatic Lands Cleanup Section Manager shall conduct a review of the dispute and shall endeavor to issue a written decision regarding the dispute within thirty (30) days of Defendants' request for review.

5. If Defendants find Ecology's Land and Aquatic Lands Cleanup Section Manager's decision unacceptable, Defendants may then request final management review of the decision. This request shall be submitted in writing to the Toxics Cleanup Program Manager within seven (7) days of receipt of the Land and Aquatic Lands Cleanup Section Manager's decision.

6. Ecology's Toxics Cleanup Program Manager shall conduct a review of the dispute and shall endeavor to issue a written decision regarding the dispute within thirty (30) days of Defendants' request for review of the Land and Aquatic Lands Cleanup Section Manager's decision. The Toxics Cleanup Program Manager's decision shall be Ecology's final decision on the disputed matter.

B. If Ecology's final written decision is unacceptable to Defendants, Defendants have the right to submit the dispute to the Court for resolution. The Parties agree that one

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

judge should retain jurisdiction over this case and shall, as necessary, resolve any dispute arising under this Decree. In the event Defendants present an issue to the Court for review, the Court shall review the action or decision of Ecology on the basis of whether such action or decision was arbitrary and capricious and render a decision based on such standard of review.

C. The Parties agree to only utilize the dispute resolution process in good faith and agree to expedite, to the extent possible, the dispute resolution process whenever it is used. Where either party utilizes the dispute resolution process in bad faith or for purposes of delay, the other party may seek sanctions.

D. Implementation of these dispute resolution procedures shall not provide a basis for delay of any activities required in this Decree, unless Ecology agrees in writing to a schedule extension or the Court so orders.

XV. AMENDMENT OF DECREE

The project coordinators may agree to minor changes to the work to be performed without formally amending this Decree. Minor changes will be documented in writing by Ecology.

Substantial changes to the work to be performed shall require formal amendment of this Decree. This Decree may only be formally amended by a written stipulation among the Parties that is entered by the Court, or by order of the Court. Such amendment shall become effective upon entry by the Court. Agreement to amend the Decree shall not be unreasonably withheld by any party. Defendants shall submit a written request for amendment to Ecology for approval. Ecology shall indicate its approval or disapproval in writing and in a timely manner after the written request for amendment is received. If the amendment to the Decree is a substantial change, Ecology will provide public notice and opportunity for comment. Reasons for the disapproval of a proposed amendment to the Decree shall be stated in writing. If Ecology does not agree to a proposed amendment, the disagreement may be addressed through the dispute resolution procedures described in Section XIV (Resolution of Disputes).

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

XVI. EXTENSION OF SCHEDULE

A. An extension of schedule shall be granted only when a request for an extension is submitted in a timely fashion, generally at least thirty (30) days prior to expiration of the deadline for which the extension is requested, and good cause exists for granting the extension. All extensions shall be requested in writing. The request shall specify:

1. The deadline that is sought to be extended;

2. The length of the extension sought;

3. The reason(s) for the extension; and

4. Any related deadline or schedule that would be affected if the extension were granted.

B. The burden shall be on Defendants to demonstrate to the satisfaction of Ecology that the request for such extension has been submitted in a timely fashion and that good cause exists for granting the extension. Good cause may include, but may not be limited to:

1. Circumstances beyond the reasonable control and despite the due diligence of Defendants including delays caused by unrelated third parties or Ecology, such as (but not limited to) delays by Ecology in reviewing, approving, or modifying documents submitted by Defendants;

2. Acts of God, including fire, flood, blizzard, extreme temperatures, storm, or other unavoidable casualty; or

3. Endangerment as described in Section XVII (Endangerment).

However, neither increased costs of performance of the terms of this Decree nor changed economic circumstances shall be considered circumstances beyond the reasonable control of Defendants.

C. Ecology shall act upon any written request for extension in a timely fashion. Ecology shall give Defendants written notification of any extensions granted pursuant to this Decree. A requested extension shall not be effective until approved by Ecology or, if required,

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Ecology Division
PO Box 40117
Olympia, WA 98504-0117
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by the Court. Unless the extension is a substantial change, it shall not be necessary to amend this Decree pursuant to Section XV (Amendment of Decree) when a schedule extension is granted.

D. An extension shall only be granted for such period of time as Ecology determines is reasonable under the circumstances. Ecology may grant schedule extensions exceeding ninety (90) days only as a result of:

1. Delays in the issuance of a necessary permit which was applied for in a timely manner;

2. Other circumstances deemed exceptional or extraordinary by Ecology; or

3. Endangerment as described in Section XVII (Endangerment).

XVII. ENDANGERMENT

In the event Ecology determines that any activity being performed at the Property under this Decree is creating or has the potential to create a danger to human health or the environment, Ecology may direct Defendants to cease such activities for such period of time as it deems necessary to abate the danger. Defendants shall immediately comply with such direction.

In the event Defendants determine that any activity being performed at the Property under this Decree is creating or has the potential to create a danger to human health or the environment, Defendants may cease such activities. Defendants shall notify Ecology's project coordinator as soon as possible, but no later than twenty-four (24) hours after making such determination or ceasing such activities. Upon Ecology's direction, Defendants shall provide Ecology with documentation of the basis for the determination or cessation of such activities. If Ecology disagrees with Defendants cessation of activities, it may direct Defendants to resume such activities.

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

If Ecology concurs with or orders a work stoppage pursuant to this section, Defendants' obligations with respect to the ceased activities shall be suspended until Ecology determines the danger is abated, and the time for performance of such activities, as well as the time for any other work dependent upon such activities, shall be extended, in accordance with Section XVI (Extension of Schedule), for such period of time as Ecology determines is reasonable under the circumstances.

Nothing in this Decree shall limit the authority of Ecology, its employees, agents, or contractors to take or require appropriate action in the event of an emergency.

XVIII. COVENANT NOT TO SUE

A. Covenant Not to Sue: In consideration of Defendants' compliance with the terms and conditions of this Decree, Ecology covenants not to institute legal or administrative actions against Defendants regarding the release or threatened release of hazardous substances covered by this Decree.

This Decree covers only the portion of the Site specifically identified in the Site Diagram (Exhibit B) and those hazardous substances that Ecology knows are located at the Property as of the date of entry of this Decree. This Covenant Not to Sue does not cover any other hazardous substance or area beyond the Property with the exception of areas where any remedial actions beyond the Property are performed pursuant to the CAP. Ecology retains all of its authority relative to any substance or area not covered by this Decree.

This Covenant Not to Sue shall have no applicability whatsoever to:

1. Criminal liability;
2. Liability for damages to natural resources; and
3. Any Ecology action, including cost recovery, against PLPs not a party to this Decree.

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

If factors not known at the time of entry of this Decree are discovered and present a previously unknown threat to human health or the environment, the Court shall amend this Covenant Not to Sue.

B. Reopeners: Ecology specifically reserves the right to institute legal or administrative action against Defendants to require them to perform additional remedial actions at the Property and to pursue appropriate cost recovery, pursuant to RCW 70.105D.050 under the following circumstances:

1. Upon Defendants' failure to meet the requirements of this Decree, including, but not limited to, failure of the remedial action to meet the cleanup standards identified in the CAP (Exhibit A);

2. Upon Ecology's determination that remedial action beyond the terms of this Decree is necessary to abate an imminent and substantial endangerment to human health or the environment;

3. Upon the availability of new information regarding factors previously unknown to Ecology, including the nature or quantity of hazardous substances at the Property, and Ecology's determination, in light of this information, that further remedial action is necessary at the Property to protect human health or the environment; or

4. Upon Ecology's determination that additional remedial actions are necessary to achieve cleanup standards within the reasonable restoration time frame set forth in the CAP.

C. Except in the case of an emergency, prior to instituting legal or administrative action against Defendants pursuant to this section, Ecology shall provide Defendants with fifteen (15) calendar days notice of such action.

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

XIX. CONTRIBUTION PROTECTION

With regard to claims for contribution against Defendants, the Parties agree that the Defendants are entitled to protection against claims for contribution for matters addressed in this Decree as provided by RCW 70.105D.040(4)(d).

XX. LAND USE RESTRICTIONS

In consultation with Defendants, Ecology will prepare the Environmental (Restrictive) Covenant consistent with WAC 173-340-440 and Chapter 64.70 RCW. After approval by Ecology, Defendants shall record the Environmental (Restrictive) Covenant with the office of the Kitsap County Auditor within ten (10) days of the performance monitoring. The Environmental (Restrictive) Covenant shall restrict future activities and uses of the Property as agreed to by Ecology and the Defendants. Defendants shall provide Ecology with the original recorded Environmental (Restrictive) Covenant within thirty (30) days of the recording date.

XXI. FINANCIAL ASSURANCES

Pursuant to WAC 173-340-440(11), Defendants shall maintain sufficient and adequate financial assurance mechanisms to cover all costs associated with the operation and maintenance of the remedial action on the Property, including institutional controls, compliance monitoring, and corrective measures.

Within sixty (60) days of the effective date of this Decree, Defendants shall submit to Ecology for review and approval an estimate of the costs that it will incur in carrying out the terms of this Decree, including operation and maintenance, and compliance monitoring. Within sixty (60) days after Ecology approves the aforementioned cost estimate, Defendants shall provide proof of financial assurances sufficient to cover all such costs in a form acceptable to Ecology, including, but not limited to, insurance or other financial assurance mechanisms provided for in WAC 173-340-440(11).

After initially providing financial assurances in a form acceptable to Ecology, Defendants may choose at any time to change financial assurance mechanisms by providing

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

proof of the new financial assurance mechanisms sufficient to cover all costs associated with the operation and maintenance of the remedial action on the Property, including institutional controls, compliance monitoring, and corrective measures, in a form acceptable to Ecology. Once Ecology has approved the new financial assurance mechanism, Defendants may utilize it. Ecology shall provide the Defendants with a written release of the superseded financial assurance mechanism.

Defendants shall adjust the financial assurance coverage and provide Ecology's project coordinator with documentation of the updated financial assurance for:

A. Inflation, annually, within thirty (30) days of the anniversary date of the entry of this Decree; or if applicable, the modified anniversary date established in accordance with this section, or if applicable, ninety (90) days after the close of Defendants' fiscal year if the financial test or corporate guarantee is used; and

B. Changes in cost estimates, within thirty (30) days of issuance of Ecology's approval of a modification or revision to the CAP that result in increases to the cost or expected duration of remedial actions. Any adjustments for inflation since the most recent preceding anniversary date shall be made concurrent with adjustments for changes in cost estimates. The issuance of Ecology's approval of a revised or modified CAP will revise the anniversary date established under this section to become the date of issuance of such revised or modified CAP.

XXII. INDEMNIFICATION

The Defendants agree to indemnify and save and hold the State of Washington, its employees, and agents harmless from any and all claims or causes of action (1) for death or injuries to persons, or (2) for loss or damage to property to the extent arising from or on account of acts or omissions of Defendants, their officers, employees, agents, or contractors in entering into and implementing this Decree. However, Defendants shall not indemnify the State of Washington nor save nor hold its employees and agents harmless from any claims or

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

causes of action to the extent arising out of the negligent acts or omissions of the State of Washington, or the employees or agents of the State, in entering into or implementing this Decree.

XXIII. COMPLIANCE WITH APPLICABLE LAWS

A. All actions carried out by Defendants pursuant to this Decree shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in RCW 70.105D.090. The permits or other federal, state or local requirements that the agency has determined are applicable and that are known at the time of entry of this Decree have been identified in the CAP.

B. Pursuant to RCW 70.105D.090(1), Defendants are exempt from the procedural requirements of Chapters 70.94, 70.95, 70.105, 77.55, 90.48, and 90.58 RCW and of any laws requiring or authorizing local government permits or approvals. However, Defendants shall comply with the substantive requirements of such permits or approvals. The exempt permits or approvals and the applicable substantive requirements of those permits or approvals, as they are known at the time of entry of this Decree, have been identified in the CAP.

Defendants have a continuing obligation to determine whether additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Decree. In the event either Ecology or Defendants determines that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Decree, it shall promptly notify the other party of this determination. Ecology shall determine whether Ecology or Defendants shall be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, Defendants shall promptly consult with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the remedial action. Ecology shall make the final determination on the additional substantive requirements that must be met by Defendants and on how Defendants must meet

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

those requirements. Ecology shall inform Defendants in writing of these requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of this Decree. Defendants shall not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

C. Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70.105D.090(1) would result in the loss of approval from a federal agency that is necessary for the state to administer any federal law, the exemption shall not apply and Defendants shall comply with both the procedural and substantive requirements of the laws referenced in RCW 70.105D.090(1), including any requirements to obtain permits.

XXIV. REMEDIAL ACTION COSTS

Defendants shall pay to Ecology costs incurred by Ecology pursuant to this Decree and consistent with WAC 173-340-550(2). These costs shall include work performed by Ecology or its contractors for, or on, the Property under Chapter 70.105D RCW, including remedial actions and Decree preparation, negotiation, oversight, and administration. These costs shall include work performed both prior to and subsequent to the entry of this Decree. Ecology's costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). Ecology has determined that $2,400,000 in costs that accrued during the approximate time period ending January 1, 2013, for the interim cleanup at the facility of 17,000 cubic yards of wood waste and contaminated sediments, site characterization and project oversight, will not be included as part of the direct costs. The remedial action costs related to this facility that accrued during that time frame in excess of $2.4 million equal $9,809.40 and will still be billed. Those costs and the costs accruing between January 1, 2013, and June 30, 2013, equal $82,866.94. Payment for that amount shall be submitted within thirty (30) days of the effective date of this Decree. For all costs incurred subsequent to June 30, 2013, Defendants shall pay the required amount within thirty (30) days of receiving from

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
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FAX (360) 586-6760

Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general statement of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Pursuant to WAC 173-340-550(4), failure to pay Ecology's costs within ninety (90) days of receipt of the itemized statement of costs will result in interest charges at the rate of twelve percent (12%) per annum, compounded monthly.

In addition to other available relief, pursuant to RCW 70.105D.055, Ecology has authority to recover unreimbursed remedial action costs by filing a lien against real property subject to the remedial actions.

XXV. IMPLEMENTATION OF REMEDIAL ACTION

If Ecology determines that Defendants have failed without good cause to implement the remedial action, in whole or in part, Ecology may, after notice to Defendants, perform any or all portions of the remedial action that remain incomplete. If Ecology performs all or portions of the remedial action because of Defendants' failure to comply with its obligations under this Decree, Defendants shall reimburse Ecology for the costs of doing such work in accordance with Section XXIV (Remedial Action Costs), provided that Defendants are not obligated under this section to reimburse Ecology for costs incurred for work inconsistent with or beyond the scope of this Decree.

Except where necessary to abate an emergency situation, Defendants shall not perform any remedial actions at the Property outside those remedial actions required by this Decree, unless Ecology concurs, in writing, with such additional remedial actions pursuant to Section XV (Amendment of Decree).

XXVI. PERIODIC REVIEW

As remedial action, including but not limited to compliance monitoring continues at the Property, the Parties agree to review the progress of remedial action at the Property, and to review the data accumulated as a result of monitoring the Property as often as is necessary and

appropriate under the circumstances. At least every five (5) years after the initiation of cleanup action at the Property, the Parties shall meet to discuss the status of the Property and the need, if any, for further remedial action at the Property. At least ninety (90) days prior to each periodic review, Defendants shall submit a report to Ecology that documents whether human health and the environment are being protected based on the factors set forth in WAC 173-340-420(4). Ecology reserves the right to require further remedial action at the Property under appropriate circumstances. This provision shall remain in effect for the duration of this Decree.

XXVII. PUBLIC PARTICIPATION

A Public Participation Plan is required for this Property. Ecology shall review any existing Public Participation Plan to determine its continued appropriateness and whether it requires amendment, or if no plan exists, Ecology shall develop a Public Participation Plan alone or in conjunction with Defendants.

Ecology shall maintain the responsibility for public participation at the Property. However, Defendants shall cooperate with Ecology, and shall:

A. If agreed to by Ecology, develop appropriate mailing lists, prepare drafts of public notices and fact sheets at important stages of the remedial action, such as the submission of work plans, remedial investigation/feasibility study reports, cleanup action plans, and engineering design reports. As appropriate, Ecology will edit, finalize, and distribute such fact sheets and prepare and distribute public notices of Ecology's presentations and meetings.

B. Notify Ecology's project coordinator prior to the preparation of all press releases and fact sheets, and before major meetings with the interested public and local governments. Likewise, Ecology shall notify Defendants prior to the issuance of all press releases and fact sheets, and before major meetings with the interested public and local governments. For all press releases, fact sheets, meetings, and other outreach efforts by Defendants that do not receive prior Ecology approval, Defendants shall clearly indicate to its

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
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FAX (360) 586-6760

audience that the press release, fact sheet, meeting, or other outreach effort was not sponsored or endorsed by Ecology.

C. When requested by Ecology, participate in public presentations on the progress of the remedial action at the Property. Participation may be through attendance at public meetings to assist in answering questions, or as a presenter.

D. When requested by Ecology, arrange and/or continue information repositories at the following locations:

a. Poulsbo Public Library
700 NE Lincoln Road
Poulsbo, Washington

b. Department of Ecology
Toxics Cleanup Program
Headquarters Office
300 Desmond Drive SE
Lacey, Washington

At a minimum, copies of all public notices, fact sheets, and documents relating to public comment periods shall be promptly placed in these repositories. A copy of all documents related to this Property shall be maintained in the repository at Ecology Headquarters in Lacey, Washington.

XXVIII. DURATION OF DECREE

The remedial program required pursuant to this Decree shall be maintained and continued until Defendants have received written notification from Ecology that the requirements of this Decree or any amendments hereto have been satisfactorily completed. This Decree shall remain in effect until dismissed by the Court. When dismissed, Section XVIII (Covenant Not to Sue) and Section XIX (Contribution Protection) shall survive.

If Ecology determines that no further remedial actions are required at all or a portion of the remainder of the Site, such areas will be covered through an amendment to this Decree and CAP. To the extent further remedial actions are required (remedial investigation, feasibility study, cleanup) at the remainder of the Site, the Parties expect that such actions will be

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
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performed under an order and/or amendment to this Decree and CAP. Notwithstanding the foregoing, if the Parties are unable to reach agreement on any amendments to the Decree that incorporate all or portions of the remainder of the Site, the failure to reach agreement on any such amendments shall not in any way impact the finality of this Decree or delay (i) the dismissal of this Decree by the Court and (ii) Ecology's notification that the requirements of this Decree have been satisfactorily completed.

XXIX. CLAIMS AGAINST THE STATE

Except for claims Defendants may have against the State of Washington, DNR, and other State agencies arising from their ownership or operation of the Property, Defendants hereby agree that they will not seek to recover any costs accrued in implementing the remedial action required by this Decree from the State of Washington or any of its agencies; and further, that Defendants will make no claim against the State Toxics Control Account or any local Toxics Control Account for any costs incurred in implementing this Decree. Defendants also expressly reserve their right to seek to recover any costs incurred in implementing this Decree from any other PLP. This section does not limit or address funding that may be provided under Chapter 173-322 WAC.

XXX. EFFECTIVE DATE

This Decree is effective upon the date it is entered by the Court.

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ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

XXXI. WITHDRAWAL OF CONSENT

If the Court withholds or withdraws its consent to this Decree, it shall be null and void at the option of any party and the accompanying Complaint shall be dismissed without costs and without prejudice. In such an event, no party shall be bound by the requirements of this Decree.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

JAMES J. PENDOWSKI
Program Manager
Toxics Cleanup Program
(360) 407-7177

Date: 12/17/13

ROBERT W. FERGUSON
Attorney General

LESLIE R. SEFFERN, WSBA #19503
Assistant Attorney General
(360) 586-4613

Date: 12/18/13

POPE RESOURCES LP

DAVID NUNES
Chief Executive Officer
(360) 697-6626

Date: _____

OPG Properties LLC

JON ROSE
President
(360) 697-6626

Date: _____

ENTERED this 20th day of December 2013.

THURMAN W. LOWANS
~~JUDGE~~ Court Commissioner
Kitsap County Superior Court

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

JAMES J. PENDOWSKI
Program Manager
Toxics Cleanup Program
(360) 407-7177

Date: _____

ROBERT W. FERGUSON
Attorney General

LESLIE R. SEFFERN, WSBA #19503
Assistant Attorney General
(360) 586-4613

Date: _____

POPE RESOURCES LP

DAVID NUNES
Chief Executive Officer
(360) 697-6626

Date: 12/17/13

OPG Properties LLC

JON ROSE
President
(360) 697-6626

Date: 12/17/13

ENTERED this _____ day of _____ 2013.

JUDGE
Kitsap County Superior Court

EXHIBIT A

Cleanup Action Plan

CLEANUP ACTION PLAN
PORT GAMBLE BAY

PORT GAMBLE, WASHINGTON

Washington State Department of Ecology
Olympia, Washington 98504

October 2013

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LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
µg/kg	micrograms per kilogram
BTV	background threshold value
CAP	Cleanup Action Plan
CFR	Code of Federal Regulations
cm	centimeters
cm/yr	centimeter per year
COC	contaminant of concern
Corps	U.S. Army Corps of Engineers
cPAH	carcinogenic polynuclear aromatic hydrocarbon
CQAP	Construction Quality Assurance Project Plan
CSM	conceptual site model
CWA	Clean Water Act
cy	cubic yards
DAHP	Washington Department of Archaeology and Historic Preservation
DMMO	Dredged Material Management Office
DMMP	Dredged Material Management Program
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
EMNR	enhanced, monitored natural recovery
EPA	U.S. Environmental Protection Agency
FLA	Former Lease Area
FS	feasibility study
HPA	Hydraulic Project Approval
JARPA	Joint Aquatic Resources Permit Application
ng/kg	nanograms per kilogram
mg/kg	milligrams per kilogram
MLLW	mean lower low water
MNR	monitored natural recovery
MTCA	Model Toxics Control Act
NHPA	National Historic Preservation Act

NWP	Nationwide Permit
OPG	OPG Properties LLC
P&T	Pope & Talbot, Inc.
PQL	practical quantitation limit
PR	Pope Resources LP
PSEP	Puget Sound Estuary Program
RCW	Revised Code of Washington
RI	remedial investigation
SEPA	State Environmental Policy Act
SMA	sediment management area
SMS	Sediment Management Standards
SPI	sediment profile imaging
SQS	Sediment Quality Standard
TEQ	toxicity equivalent quotient
TVS	total volatile solids
WAC	Washington Administrative Code

EXECUTIVE SUMMARY

This Cleanup Action Plan (CAP) describes the selected cleanup action for a portion of the Port Gamble Bay and Mill Site (Site), located in Port Gamble, Washington. Specifically, this CAP selects a cleanup action for Port Gamble Bay (referred to as the Property, Port Gamble Bay, or the Bay).

This CAP has been developed in accordance with the Model Toxics Control Act (MTCA), RCW 70.105D, and its implementing regulations, WAC 173-340, as well as the Sediment Management Standards (SMS) regulations, WAC 173-204. Ecology will make cleanup action decisions for the former sawmill area and uplands areas to the west and south of the former sawmill area, all of which are generally located near the eastern terminus of NE View Drive in Port Gamble, Washington ("Uplands RI/FS Area"), through a future amendment to this CAP or a separate cleanup action plan.

The selected cleanup action is based on site-specific data provided in the Partial Remedial Investigation/Feasibility Study Report (PRI/FS) and documents referenced therein. The PRI/FS is on file at the Washington State Department of Ecology's (Ecology) Headquarters located at 300 Desmond Drive, Lacey, Washington.

Site Background

Port Gamble Bay is located in Kitsap County and encompasses more than 2 square miles of subtidal and shallow intertidal habitat just south of the Strait of Juan de Fuca. Under Ecology's Toxics Cleanup Program Puget Sound Initiative, Port Gamble Bay is one of seven bays in Puget Sound identified for focused sediment cleanup. The Bay and surrounding areas support diverse aquatic and upland habitats, as well as resources for fishing, shellfish harvesting, and many other aquatic uses. The area surrounding the Bay remains largely rural in nature, though more than 100 acres of the basin are currently in commercial land use, largely in the Gamble Creek watershed. The Port Gamble S'Klallam Tribal Reservation is located east of the Bay. The Tribe uses the Bay for shellfish harvesting, fishing, and other resources.

Pope and Talbot, Inc. (P&T) continuously operated a sawmill facility on the upland portion of the Site for a period of approximately 142 years (1853 to 1995). Over that period, the upland area where the sawmill was located (Mill) underwent a variety of changes, including expansion by filling, as well as changes in the location and function of buildings and structures. Logs were generally stored, rafted and sorted in-water throughout the Bay. A 72 acre log rafting area along the western shore of the Bay (Former Lease Area) was leased by Department of Natural Resources (DNR) to P&T in several consecutive leases from 1974 to 2001 and terminated in 1996 at P&T's request. The majority of log rafting activities ceased in 1995 when the sawmill closed.

Contamination at the Site is related to use of sawmill buildings to saw logs for lumber, operation of two chip barge loading facilities and a log-transfer facility, sawmill emissions of particulates from burning of wood and wood waste, and the in-water log rafting and storage areas. Creosote treated pilings were placed throughout the Bay to support pier and wharf structures and to facilitate storage and transport of logs and wood products. Large accumulations of wood waste covered portions of the Bay.

Activities at the Site resulted in releases of hazardous substances at the Property. Hazardous substances released included cadmium, carcinogenic polynuclear aromatic hydrocarbons, dioxins/furans, and toxicity associated with wood waste and its breakdown products including, phenols, resin acids, and total and dissolved sulfides. Ecology has determined that these releases of hazardous substances at the Property present a threat to human health and the environment and require remedial action.

In 1985, P&T transferred ownership of the sawmill, uplands and adjacent tidelands to Pope Resources LP (PR). P&T continued wood products manufacturing at the Site until 1995 under a lease with PR. OPG Properties LLC (OPG), formerly known as Olympic Property Group LLC, was formed in 1998 to manage PR's real estate in Kitsap County and presently operates the Property including making leasing arrangements and property improvements.

A number of interim actions were conducted between 2002 and 2009 at the Site.

Study Background

Between 2002 and 2005, PR/OPG excavated approximately 26,310 tons of contaminated soils from the Mill. In 2003, approximately 13,500 cubic yards (cy) of sediment containing accumulations of wood waste and hazardous substances were dredged from a 1.8-acre area of the Property and disposed of at an approved upland facility. In 2007, Ecology and DNR dredged an additional 17,500 cy of wood waste from an adjacent one-acre area, and placed a six-inch layer of clean sand over a portion of the newly dredged area. Solid waste materials were segregated and disposed of at an approved off-site landfill facility. Salt in the dredged wood waste was removed using a freshwater washing system to allow for upland beneficial reuse of these materials in 2008 and 2009. While these earlier sediment cleanup actions reduced wood waste and hazardous substance risks at the Property, accumulations of wood waste remain on the bed of the Property, particularly at locations near the Mill. Observed biological toxicity requires further sediment cleanup under the SMS to address wood waste and its degradation byproducts.

Effective May 8, 2008, Ecology and Defendants entered into Agreed Order No. DE 5631, pursuant to which two focused Remedial Investigation and Feasibility Study Reports for portions of the Site including the Mill and the Bay were completed, submitted and released for public comment in February and March 2011. In December 2012, based upon public comment, the reports were revised and combined into a PRI/FS for Port Gamble that summarizes existing remedial investigation results for the Mill and the Bay and develops and evaluates remedial alternatives for the Property. The conclusions of the draft report form the bases for the cleanup action to be implemented in the Bay.

The PRI/FS identified risks to sensitive benthic invertebrates in aquatic areas of the Property adjacent to portions of the Mill, Former Lease Area, and also in the Central Bay. Potential human health risks from cadmium, dioxins/furans, and carcinogenic polynuclear aromatic hydrocarbon (cPAH) were also identified for those who may consume relatively large quantities of shellfish obtained from the Property and from natural background areas of Puget Sound. Overall concentrations of cadmium and dioxins/furans in Property sediments are currently 2 to 3 times higher than Puget Sound natural background levels. In addition,

cPAH sediment concentrations are roughly 10 times higher at the Property compared to Puget Sound natural background levels.

Ecology developed and evaluated a range of cleanup action alternatives for addressing remaining contamination identified in Port Gamble Bay. More detailed information on the PRI/FS, including the cleanup options that were evaluated, can be found on Ecology's Toxics Cleanup Website (http://www.ecy.wa.gov/programs/tcp/sites/).

Cleanup Action Plan Overview

Based on the findings of the PRI/FS, Ecology prepared this CAP for the Property. This CAP provides the following:

- Identifies cleanup levels that OPG/PR needs to meet
- Requires cleanup actions to achieve these cleanup levels from the options identified in the PRI/FS, and describes these actions
- Establishes a schedule to carry out the cleanup
- Requires monitoring activities to demonstrate whether the cleanup is effective

The following actions have been selected to address existing sediment contamination at the Property:

- Approximately 2,000 creosoted pilings will be removed from the Bay as a source control measure for protection of human health and to facilitate access for subsequent dredging and capping. This action will be sequenced with removal of approximately 73,000 square feet of existing overwater structure (subject to more accurate delineation as needed for the engineering design report) adjacent to the Mill and removal of the Log Transfer Dock and pilings from staging and rafting areas throughout the Bay. All piling removal will be sequenced with follow-on dredging or capping actions to maximize control of piling removal residuals. The pilings will be removed and disposed of using best efforts, and equipment preferences and best management practices (BMPs) identified in both the (1) statewide Hydraulic Project Approval (HPA) - *Creosote Piling and Structural Removal* (WDFW 2011) and (2) the accompanying DNR Puget Sound Initiative – *Derelict Creosote Piling Removal, BMPs for Pile Removal and Disposal* (DNR 2011). Areas of moderate to extensive piling

removal that are not capped or dredged will be covered with 6 inches of sand to control residuals.

- Approximately 10,000 to 15,000 cy of intertidal sediments from the Mill that exceed Puget Sound natural background levels will be excavated (likely using upland-based equipment operating during relatively low tidal conditions) to approximately two feet below the existing sediment surface, and backfilled and/or capped. Excavated material will be screened to remove debris, and the screened sediments reused or disposed of in upland areas within or near the Mill, as allowed. If no other allowed reuse or disposal alternatives are identified, the excavated material will be disposed of at an approved upland disposal facility.
- Approximately 30,000 to 45,000 cy of nearshore sediments (located inshore of approximately -20 feet mean lower low water [MLLW]) with biological toxicity and containing significant wood chip accumulations with total volatile solids (TVS) concentrations exceeding 15 percent will be dredged from the North Mill and South Mill areas. The final dredge plan design will be determined during the remedial design phase based on engineering and cultural resources considerations. Subsequently, the dredged areas will be backfilled and/or capped, including placement of 6 inches of sand to control dredging residuals. Subject to Dredged Material Management Program (DMMP) approval, dredged material will be screened to remove debris, and the screened sediments disposed at a DMMP open-water disposal facility, or otherwise reused or disposed of in upland areas within or near the Mill as allowed. If no other allowed reuse or disposal alternatives are identified, the dredged material will be disposed at an approved upland disposal facility.
- Approximately 7 acres of sediments in the South Mill area offshore of approximately -20 feet MLLW with biological toxicity and containing significant wood chip accumulations (TVS exceeding 15 percent) will be capped with an approximate 4-foot-thick cap. The final cap design will be determined during the remedial design phase. Beneficial reuse of clean navigational dredge material will be the source of the cap material, using materials that will support healthy benthic, shellfish, and forage fish communities, including geoduck.
- Approximately 3 acres of shallow subtidal sediments in the North Mill area with biological toxicity but with moderate wood waste accumulations (TVS less than 15 percent) will be capped with an approximate 1-foot-thick cap. Beneficial reuse of

clean navigational dredge material will be the source of the cap material, using materials that will support healthy benthic, shellfish, and forage fish communities.

- Following completion of dredging and placement of caps in the North and South Mill areas, six inches of enhanced monitored natural recovery (EMNR) materials will be placed over roughly 100 acres of subtidal sediments in the remaining parts of the Mill, Former Lease Area, and Central Bay with biological toxicity but with moderate wood waste accumulations (TVS less than 15 percent). To the extent practicable, the source of the sand will be clean navigational dredge material, which will enhance the rate of natural recovery, reduce concentrations of conventional and wood waste breakdown contaminants, and achieve a healthy benthic community. Ecology may consider minor changes to the schedule for EMNR placement subject to the availability of clean dredged material from suitable beneficial reuse projects. Otherwise alternate sources of material will be used. The EMNR area will be further refined during remedial design and as part of adaptive management during initial construction phases to reflect ongoing natural recovery processes. EMNR actions may not be needed in those areas that pass SMS biological criteria during remedial design delineation sampling.
- During remedial design, a monitoring plan will be developed to provide methods and scheduled frequency of monitoring to assess the effectiveness of the remedy. Piling removal along with the dredging, capping, and EMNR outlined above will eliminate the major sources of contaminants, accelerating natural recovery over time.

1. INTRODUCTION

This CAP describes the selected cleanup action for a portion of the Site, located in Port Gamble, Washington. Specifically, the CAP selects proposed cleanup actions for Port Gamble Bay. The CAP provides a description of the proposed cleanup actions and sets forth functional requirements that the cleanup must meet to comply with MTCA and the SMS. The remainder of the Site will be covered through a future amendment to the Consent Decree and CAP if Ecology determines that no further remedial actions at the remainder of the Site are required. To the extent further remedial actions are required (remedial investigation, feasibility study, cleanup) at the remainder of the Site, Ecology expects such actions will be performed under an order and/or amendment to the Consent Decree and CAP.

1.1 Site Background

Under Ecology's Toxics Cleanup Program Puget Sound Initiative, Port Gamble Bay (Figure 1-1) is one of seven bays in Puget Sound identified for focused sediment cleanup. Port Gamble Bay is located in Kitsap County and encompasses more than 2 square miles of subtidal and shallow intertidal habitat just south of the Strait of Juan de Fuca. The Bay and surrounding areas support diverse aquatic and upland habitats, as well as resources for fishing, shellfish harvesting, and many other aquatic uses. The area surrounding the Bay remains largely rural in nature, though more than 100 acres of the basin are currently in commercial land use, largely in the Gamble Creek watershed. The Port Gamble S'Klallam Tribal Reservation is located east of the Bay, and the Tribe extensively uses the Bay for shellfish harvesting, fishing, and other resources. An upland tribal casino operates in the watershed.

In 1853, the corporate predecessor to P&T established one of the first sawmills on Puget Sound in Port Gamble, and continuously operated a forest products manufacturing facility at the Mill including in the Bay up until 1995. Between 1853 and 1995, operations in Port Gamble included a succession of sawmill buildings, two chip loading facilities, a log transfer facility, and log rafting and storage areas. During the mill's operating period, logs were rafted and stored offshore of the Mill. In the late 1920s, a chip barge loading facility was installed on the north end of the Mill. During the mid-1970s, an additional chip barge

loading facility (referred to as the alder mill) was constructed in the southeast portion of the Mill.

In 1985, P&T transferred ownership of the uplands and adjacent tidelands portion of the Mill to PR. P&T continued wood products manufacturing until 1995 under a lease with PR. Mill operations ceased in 1995, and the sawmill facility was dismantled and mostly removed in 1997. Since 1997, the uplands portion of the Mill have been leased to a variety of parties for use as a log sort and wood chipping yard, material handling activities, a marine laboratory, and parking.

P&T leased the 72-acre portion of the Former Lease Area (FLA) from DNR between 1974 and 2001 for log storage and transfer. The majority of log rafting ceased in 1995 when the sawmill closed. P&T removed pilings from the Former Lease Area in 1996. Similarly, log rafting and associated log sort yard activities that began in 1970 at the former log transfer facility ceased after P&T removed the pilings in 1996. Figure 1-1 also shows several historical landfills along the western shoreline, some of which received mill and municipal waste materials, but which were subsequently closed and remediated to MTCA standards.

In January 1997, Ecology conducted an initial investigation of the Mill, which consisted of sampling sediment in four catch basins. The results of that investigation indicated that concentrations of petroleum hydrocarbons and metals were present at levels above MTCA and SMS chemical criteria for these compounds. In April 1997, Clean Services Company, Inc. removed accumulated materials from 12 catch basins, four valve vaults, and four sumps.

In July 1998, Ecology notified P&T of the potential listing of the Mill on Ecology's Confirmed and Suspected Contaminated Site List. Subsequently, detailed environmental investigations were conducted by P&T and PR/OPG to characterize soil, groundwater, surface water, and sediment quality conditions at portions of the Site. The site characterization data confirmed the presence of hazardous substances in soil and groundwater in several uplands areas. The investigations also confirmed the presence of wood waste in nearshore sediments. Based on these data, Ecology added the Mill Site to the hazardous sites list in 2001.

Between 2002 and 2005, PR/OPG excavated approximately 26,310 tons of contaminated soils from the Mill, and in 2003, P&T dredged approximately 13,500 cubic yards (cy) of sediment containing wood waste from a 1.8-acre area of the Property. Excavated upland soils and the 2003 wood waste dredge material were disposed of at approved upland facilities. In 2004, follow-on surface sediment sampling and sediment profile imaging (SPI) was conducted by P&T to characterize post-dredge sediment quality conditions and to provide a baseline dataset for evaluation of anticipated future natural recovery. In 2006, P&T and Ecology performed additional sediment characterization, including benthic infaunal abundance, sediment bioassays, and SPI across a gradient of wood waste levels.

In early 2007, DNR and Ecology dredged an additional 17,500 in situ cy of wood waste from a 1-acre area adjacent to the 2003 dredging action and placed a 6-inch layer of clean sand over a portion of the newly dredged area. In cooperation with this agency-led project, P&T took over the day-to-day management of the dredged material once it was transferred to shore, and subsequently removed salt from the material utilizing an on-site upland holding cell and freshwater washing system to facilitate upland beneficial reuse of these materials. Unsuitable solid waste materials were segregated and disposed of at an approved off-site landfill facility. All soil segregation, disposal, treatment, and relocation tasks were completed in spring 2009, in accordance with Kitsap County Grading Permit 08-52323.

In November 2007, P&T filed for bankruptcy (Delaware Case No. 07-11738).

Two focused Remedial Investigation and Feasibility Study Reports for portions of the Site including the Mill and the Bay were completed, submitted and released for public comment in February and March 2011. In response to public comments, in 2011, Ecology performed supplemental sediment and tissue sampling at the Property. This sampling included collection of additional sediment chemistry and sediment bioassay samples. During this time, the Port Gamble S'Klallam Tribe also collected sediment and tissue samples.

In June 2012, based upon public comment, the reports were revised and combined into a PRI/FS that summarizes existing remedial investigation results for the Mill and the Bay and develops and evaluates remedial alternatives for the Property. The conclusions of the PRI/FS form the bases for the cleanup action to be implemented in the Bay.

1.2 Purpose

The purpose of this CAP is to:

- Describe the Property, including a summary of relevant history and the nature and extent of sediment contamination
- Identify site-specific cleanup levels and points of compliance for the selected cleanup actions
- Identify applicable state and federal laws for the selected cleanup action
- Identify and describe the selected cleanup action for the Bay
- Summarize the other cleanup action alternatives evaluated in the FS
- Discuss compliance monitoring requirements
- Present the schedule for implementing the CAP

2 SUMMARY OF SITE CONDITIONS

This section summarizes the findings of the PRI/FS report, including the nature and extent of sediment chemicals of concern (COCs).

2.1 Site Environmental Conditions

Port Gamble Bay is located in north-central Puget Sound in Kitsap County (Figure 1-1). The Bay has water depths ranging from 0 to -65 feet mean lower low water (MLLW) datum, although more typical bottom elevations in the center of the Bay range from -30 to -40 feet MLLW. The Bay is oriented with its long axis directed generally north to south, approximately 2.9 miles long and 0.9 miles wide at its maximum dimensions.

2.2 Summary of RI Sampling

As discussed above, between 2002 and 2005, PR/OPG excavated approximately 26,310 tons of contaminated soils that exceeded cleanup levels from the Mill and disposed of these materials at an approved and appropriate off-site landfill facility. Soil lead concentrations marginally exceeding conservative ecological screening criteria (but less than residential standards based on human health) remain in isolated areas of the Mill, but are unlikely to pose significant adverse effects to terrestrial ecological receptors. The previous interim actions at the Mill Site also reduced concentrations of all but one groundwater contaminant (arsenic) to levels that are now protective of human health and the environment. Current groundwater arsenic concentrations in a portion of the Mill are greater than the 8 µg/L natural background concentration due to local geochemical conditions, but are less than the marine surface water chronic criterion to protect aquatic life.

Ten sampling investigations were completed in the Bay between 2000 and 2011. The results of these studies are described and incorporated in the PRI/FS. Both sediment and tissue samples have been collected Bay-wide, with additional focused sampling in the North Mill and South Mill areas. The work has included surface sampling, sediment core collection, and sediment profile imaging (SPI). In addition to sediment conventional data and chemistry, bioassay, and tissue sampling, work has also included radioisotope dating of sediment cores to

characterize overall net sedimentation rates in the Bay. Key conclusions from the sampling with respect to contaminants of concern (COC) are summarized in the sections below.

2.3 Conceptual Site Model

The conceptual site model (CSM) described in the PRI/FS report identified the following current and former sources of contamination to the Bay: wood waste, creosoted pilings, wood burning and hog fuel boiler burning, upland mill activities, and shoreline debris. Transport pathways identified in the CSM include currents and tidal fluctuations, concentration of clay particles, aerial deposition, and stormwater runoff.

Potential ecological and human health risks were also identified in the CSM. Benthic effects have been studied primarily through a series of bioassay tests conducted during several studies over the last 10 years. The primary conclusion in the PRI/FS is that risks to sensitive benthic invertebrates have been identified adjacent to the Mill, Former Lease Area, and Central Bay. Potential human health risks were also identified for those who may consume large amounts of shellfish obtained from both the Bay and from natural background areas of Puget Sound. Overall concentrations of cadmium and dioxins/furans in the Bay sediments were 2 to 3 times higher than Puget Sound natural background levels, and carcinogenic polynuclear aromatic hydrocarbon (cPAH) sediment concentrations were roughly 10 times higher in the Bay compared to Puget Sound natural background levels.

Consistent with deposition rates measured throughout Puget Sound (Carpenter et al. 1985; Lavelle et al. 1985), net sedimentation rates throughout the Bay average approximately 0.4 ± 0.1 centimeters per year (cm/yr), based on radioisotope dating (as described in the PRI/FS), corrected for wood waste accumulations in the Mill (four cores total).

2.4 Chemicals of Concern

The PRI/FS report evaluated a series of human health COCs: metals (arsenic, cadmium, copper, and mercury), cPAHs, polychlorinated biphenyls, and dioxins/furans. Of this list, cadmium, cPAHs, and dioxins/furans were identified as Site-related human health COCs. Cadmium has been identified as a low-level COC for human health, while cPAHs have been

identified as a primary COC for human health. Dioxins/furans are a site-related COC for human health in limited areas of the Bay.

In addition, addressing biological toxicity in the Bay will require cleaning up wood waste and its degradation byproducts. The PRI/FS identified bioassay toxicity in several areas where wood waste and associated breakdown products occurred. Wood waste provides an inappropriate substrate for many benthic and epibenthic organisms to live on or in, and also impacts aquatic plants. In addition, ammonia, sulfides, and other toxic compounds can be generated during breakdown of wood waste in anoxic environments. At Port Gamble Bay, areas with abundant wood waste have elevated sulfide concentrations. Also, wood contains many other natural substances that can be present and toxic under certain circumstances, depending on the type of wood, the degree of processing, and environmental conditions. These chemicals include phenols, resin acids, and tannins. Some elevated levels of phenols and resin acids have been observed in areas of Port Gamble Bay with wood waste accumulations. Bioassay toxicity was used to identify sediments requiring cleanup but the presence of wood waste (as measured by total volatile solids), phenols, resin acids and total and dissolved sulfides were also used to help delineate areas of concern.

3 CLEANUP REQUIREMENTS

The MTCA regulations and SMS provide that a cleanup action must comply with cleanup levels for COCs at the points of compliance. The site-specific cleanup standards are summarized in the following sections, along with delineation of sediment management areas (SMAs) in Port Gamble Bay. Application of the standards and delineation of SMAs will be further refined in the remedial design and must be approved by Ecology. Cleanup action objectives and applicable or relevant and appropriate requirements (ARARs) based on federal and state laws (WAC 173-340-710) that the selected cleanup remedy must meet are also briefly summarized at the end of this section.

3.1 Cleanup Standards

Cleanup standards consist of: (1) cleanup levels that are protective of human health and the environment; and (2) the point of compliance at which the cleanup levels must be met. Site-specific cleanup standards were developed in the PRI/FS, which provides detailed discussions of the derivation of sediment cleanup standards, including both ecological risk-based and human health risk-based standards.

Ecological risk-based cleanup standards for sediments were based on SMS biological criteria, using the bioassay results presented in the PRI/FS report. The site-specific bioassay cleanup standard identified by Ecology is the Sediment Quality Standard (SQS) criterion, which was used to delineate SMAs as described below.

Human health risk-based standards were developed based on the highest risk-based concentrations, natural background levels, and practical quantitation limits (PQLs). Standards were developed for cadmium, cPAHs, and dioxins/furans.

3.1.1 Sediment Cleanup Levels

Based on the evaluations described in the PRI/FS report, Table 3-1 summarizes the site-specific sediment cleanup levels.

Table 3-1
Sediment Cleanup Levels

Chemical of Concern	Preliminary Cleanup Level
Toxicity due to wood waste breakdown products	SQS numeric biological standards described in WAC 172-204-320(3)
cPAH TEQ	16 µg/kg dry wt.
Dioxin/furan TEQ	5 ng/kg dry wt.
Cadmium	3 mg/kg dry wt.

3.1.2 Points of Compliance

Under MTCA, the point of compliance is the point or location on a site where the cleanup levels must be attained. For marine sediments, the point of compliance for protection of the environment is surface sediments within the biologically active zone. The biologically active zone is the depth in surface sediments within which benthic organisms are found. For most members of the benthic community, a 10-centimeter (cm) biologically active zone is considered appropriate (e.g., for benthic infauna such as polychaete worms). However, for geoducks, which are an important natural resource in Port Gamble Bay, the biologically active zone extends approximately 3 feet below the mudline (Straus et al. 2009).

The biologically active zone can include deeper sediments that could become exposed given conditions or activities in the Bay that may be expected to occur following cleanup (e.g., storm events or propeller wash that contribute to erosional forces).

3.2 Sediment Management Areas

This section summarizes the PRI/RS report conclusions regarding SMAs in Port Gamble Bay that exceed site-specific cleanup standards. Figure 3-1 presents the location of these SMAs. Briefly, the SMAs are as follows:

- North Mill (SMA-1). An approximate 6-acre area located in the embayment north of the former Mill. The North Mill SMA has localized deep deposits of subtidal wood debris near the former chip loading area, and was delineated based on bioassay results that exceed SQS biological criteria, elevated cPAH levels that exceed background, and elevated dioxins/furans that exceed background and the PQL.

- South Mill (SMA-2). An approximately 20-acre area located immediately south and east, and adjacent to the former Mill. This SMA has areas of relatively deep deposits of subtidal wood debris, particularly adjacent to the former alder mill chip loading area, and was delineated based on bioassay results that exceed SQS biological criteria, elevated cPAH levels that exceed background, and elevated dioxins/furans that exceed background and the PQL.
- Central Bay (SMA-3). An approximate 80-acre area located in the south-central portion of the Bay. This area was delineated based on bioassay results that exceed SQS biological criteria and the presence of wood waste breakdown products in sediments.
- Former Lease Area (SMA-4). An approximate 20-acre area located along the western shoreline of the south-central portion of the Bay within the FLA. This area was delineated based on bioassay results that exceed SQS biological criteria and the presence of wood waste breakdown products in sediments.
- cPAH Background Area (SMA-5). An approximate 600-acre area that encompasses all of the other SMAs. The boundary of SMA-5 was developed based on surface sediment cPAH concentrations exceeding natural background levels. It also includes an area of elevated dioxins/furans near the FLA and one station at which cadmium exceeds natural background levels.

3.3 Cleanup Action Objectives

Cleanup action objectives consist of chemical- and medium-specific goals for protecting the environment. The cleanup action objectives specify the media and contaminants of interest, potential exposure routes and receptors, and proposed cleanup goals for Bay-wide sediments.

The cleanup action objectives for this CAP are focused on sediments and the COCs listed in Table 3-1, including:

- Toxicity due to wood waste breakdown products
- Carcinogenic petroleum hydrocarbons toxicity equivalent quotient (TEQ)
- Dioxin/furan TEQ
- Cadmium

Exposure routes to be addressed by the Bay cleanup action include transport pathways to benthic receptors and humans, and include: (1) currents and tidal fluctuations; (2) concentrations of clay particles; (3) aerial deposition; and (4) stormwater runoff. Exposure of benthos and humans results from both direct contact with and ingestion of sediments. In the case of human exposure, ingestion primarily occurs indirectly through shellfish consumption and secondarily through incidental ingestion of sediments during shellfish harvesting and other beach uses.

The sediment cleanup action objectives for this CAP are summarized as follows:

1. Eliminate, reduce, or otherwise control to the extent practicable risks to benthic organisms through exposure to sediments or porewater containing deleterious wood waste and/or other COCs that exceed the cleanup levels summarized in Table 3-1.
2. Eliminate, reduce, or otherwise control to the extent practicable risks to humans from ingestion of seafood containing chemicals that exceed risk-based concentrations and/or natural background concentrations.

3.4 Compliance With Applicable Laws

The cleanup action in the Bay will be performed pursuant to MTCA and the SMS under the terms of a Consent Decree between Ecology and PR and OPG.

In addition to the cleanup standards developed through the SMS process, other regulatory requirements must be considered in the selection and implementation of a cleanup action. MTCA requires cleanup standards to be at least as stringent as all applicable state and federal laws (WAC 173-340-700(6)(a)). In addition, all cleanup actions must comply with applicable state and federal laws (WAC 173-340-710(1)). The applicable state and federal laws may impose certain technical and procedural requirements (including obtaining permits or approvals) for performing cleanup actions. Applicable state and federal laws are identified in this Section. At this time, Ecology has not identified any relevant and appropriate requirements which apply to these cleanup actions.

Pursuant to RCW 70.105D.090(1), Defendants are exempt from the procedural requirements of Chapters 70.94, 70.95, 70.105, 77.55, 90.48, and 90.58 RCW and of any laws requiring or

authorizing local government permits or approvals. However, Defendants shall comply with the substantive requirements of such permits or approvals. The exempt permits or approvals and the applicable substantive requirements of those permits or approvals, as they are known at the time of this plan are identified in Section 3.5. Where they are not identified, they will be determined at the remedial design stage of the cleanup. The substantive requirements of any permits or approvals will be added to this CAP by amendment. The amendment will be issued for public notice and comment. The amendment's requirements will become enforceable under the Consent Decree without an amendment to the Decree.

3.4.1 State Environmental Policy Act

The State Environmental Policy Act (SEPA) (RCW 43.21C; WAC 197-11) and the SEPA procedures (WAC 173-802) are intended to ensure that state and local government officials consider environmental values when making decisions. Under WAC 197-11-250 MTCA and SEPA procedural requirements are integrated to reduce duplication and improve public participation, including common public review and comment. SEPA requires the identification, avoidance, minimization and/or mitigation of environmental impacts associated with agency permitting or actions such as the MTCA cleanup of Port Gamble Bay. The impacts from this cleanup have been identified along with requirements to select construction methods and timing and implementation of Best Management Practices that will mitigate those impacts that cannot be avoided during demolition and construction. Avoidance, minimization and mitigation measures identified during preparation of the SEPA checklist are described in the Mitigated Determination of Non-Significance (MDNS) attached as Appendix C. Additional avoidance and minimization measures and/or mitigation requirements identified prior to and during construction must also be met.

3.4.2 Puget Sound Dredged Material Management Program

In Puget Sound, the open-water disposal of sediments is managed under the Dredged Material Management Program (DMMP). This program is administered jointly by the United States Army Corps of Engineers (Corps), the U.S. Environmental Protection Agency (EPA), DNR, and Ecology. The DMMP developed the Puget Sound Dredge Disposal Analysis protocols, which include testing requirements to characterize whether dredged sediments are appropriate for open-water disposal. The results of this characterization are formalized

in a written suitability determination from the Dredged Material Management Office (DMMO).

Sediments dredged from SMA-1 and SMA-2 may be disposed of in open water. The DMMP has designated disposal sites throughout Puget Sound. Initial DMMP characterization of sediments has been performed on representative subsurface samples collected from SMA-1 and SMA-2 (including dioxin/furan testing), and these data indicate that some of the wood waste material to be dredged from these SMAs is likely suitable for unconfined open-water disposal at a non-dispersive location (e.g., at the nearby Port Gardner disposal site). Similar wood waste materials have also been determined to be suitable for open-water disposal at DMMP facilities (e.g., DMMP 2009). However, additional dredged material characterization would be required during remedial design to complete the suitability determination. If it is determined to be suitable, PR/OPG must comply with DMMP requirements including material approval and disposal requirements.

3.4.3 Shoreline Management Act

The Shoreline Management Act (RCW 90.58) and its implementing regulations establish requirements for developments on the shorelines of the state. A substantial development shall not be undertaken on shorelines of the state without first obtaining a permit from the government entity having administrative jurisdiction. Any development must be consistent with the policy of RCW 90.58.140, and the applicable guidelines, rules or master program. The Kitsap County Master Program was revised January 2013 and has been reviewed by Ecology and is currently undergoing public comment.

3.4.4 Washington Hydraulics Code

The Washington Hydraulics Code (WAC 220-110) establishes requirements for the construction of any hydraulic project or the performance of any work that will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh water of the state. The code also creates a program requiring Hydraulic Project Approval (HPA) permits for any activities that could adversely affect fisheries and water resources. Timing restrictions and technical requirements under the hydraulics code are applicable to dredging, capping, and placement of post-dredge residual covers.

3.4.5 Federal Clean Water Act

The Clean Water Act (CWA) is the primary federal law for protecting water quality from pollution. The CWA regulations provide requirements for the discharge of dredged or fill material to waters of the United States and are applicable to any in-water work. The CWA regulations also prescribe permitting requirements for point source and non-point source discharges. Acute criteria are relevant and appropriate requirements for discharges to marine surface water during sediment dredging, as well as for return flows (if necessary) to surface waters from dewatering operations.

Section 402 of the Clean Water Act requires a permit for discharge of pollutants pursuant to 33 U.S.C. § 1342 that is likely to apply to construction stormwater from the cleanup. Construction activities that disturb 1 acre or more of land need to comply with the provisions of construction stormwater regulations. Ecology has determined that a construction stormwater general permit does not meet the requirements for the permit exemptions in RCW 70.105D.090, and thus a project-specific construction stormwater permit will be required if land disturbance greater than 1 acre is necessary. A construction stormwater general permit must be obtained during the design phase and a Construction Quality Assurance Project Plan (CQAP) must be prepared as part of the remedial design process, supplemented as appropriate by the remedial contractor.

Section 404 of the CWA requires permits from the Corps for discharges of dredged or fill material into waters of the United States, including wetlands. 33 U.S.C. § 1344. Section 404 permit requirements depend on suitability determinations (described previously in 3.4.2) according to DMMP guidelines. Section 404(b)(1) requires an alternatives analysis as part of the permitting process. Requirements for all known, available, and reasonable technologies for treating waste water prior to discharge to state waters are applicable to any dewatering of marine sediment prior to upland disposal.

Section 401 of the CWA requires the state to certify that federal permits are consistent with water quality standards. 33 U.S.C. § 1341. The requirements of a certification determination are applicable.

3.4.6 Washington Water Pollution Control Act

Ecology has promulgated statewide water quality standards under the Washington Water Pollution Control Act (RCW 90.48). Under these standards, all surface waters of the state are divided into classes (Extraordinary, Excellent, Good, and Fair) based on the aquatic life uses of the water bodies. Water quality criteria are defined for different types of pollutants and the characteristic uses for each class of surface water. The standards for marine waters are applicable to discharges to surface water during sediment dredging, and return flows (if necessary) to surface waters from dewatering operations.

3.4.7 Archaeological and Historic Preservation Act

The Archaeological and Historic Preservation Act (16 U.S.C.A. § 496a-1) is applicable if any covered materials are discovered during excavation or dredging activities performed as a part of the selected sediment cleanup action. Concurrent with the PRI/FS, a Bay-wide cultural resources overview was developed for the Site to identify and map areas of known or possible historical, archaeological, and cultural resources (NWAA 2010). The overview was developed by a professional archaeologist for the area in and adjacent to the Site and provided specific steps to complete identification, evaluation, and protection of cultural resources that may be affected by sediment cleanup. Information from the overview was considered by Ecology in developing the selected sediment cleanup remedy for Port Gamble Bay. Significantly, the cleanup actions included in the selected remedy will occur in locations and at elevations (i.e., recent fill) that are not expected to coincide with the presence of cultural resources.

Early in the remedial design and permitting of the cleanup action, PR/OPG, in consultation with the Washington Department of Archaeology and Historic Preservation (DAHP) and the Port Gamble S'Klallam Tribe and other tribes, will further evaluate areas where cleanup-related disturbance of cultural resources may occur, including capping, dredging, staging and mooring areas, and transport routes as appropriate. More detailed cultural resource evaluations, as necessary, will be integrated with studies for engineering design as practicable. Early in the remedial design phase, PR/OPG will review existing cultural resource records, geotechnical data, historical documents, and ethnographic information to

determine areas of potential effects on cultural resources and to identify data gaps. Building on the cultural resources overview of Port Gamble Bay, which identified and mapped areas of known or possible historical, archaeological, and cultural resources within the cleanup area (NWAA 2010), PR/OPG will develop a Cultural Resources Study Plan, including archaeological fieldwork and subsurface testing as necessary in marine waters and upland areas where ground and sediment disturbance is planned (for efficiency, opportunities will be identified to conduct subsurface testing in conjunction with collection of data as part of other elements of remedial design).

The cleanup actions selected by Ecology also include appropriate compliance monitoring provisions during implementation of the cleanup action, consistent with Section 106 of the National Historic Preservation Act (NHPA) and Washington State laws. Detailed compliance monitoring plans will be developed during the remedial design and permitting phase, consistent with regulatory requirements. Appropriate cultural resource work plans, including a cultural resources treatment plan and an inadvertent discovery plan, will be included in the remedial design.

3.4.8 Health and Safety

Sediment cleanup construction activities will be performed in accordance with the requirements of the Washington Industrial Safety and Health Act (RCW 49.17) and implementing regulations and the federal Occupational Safety and Health Act and implementing regulations (29 C.F.R. §§ 1910, 1926). These applicable regulations include requirements that workers are to be protected from exposure to contaminants and that excavations are to be properly shored.

3.4.9 Nationwide Permit 38

The cleanup action may qualify for a U.S. Army Corps of Engineers (Corps) Nationwide Permit 38 (NWP 38). Otherwise it may qualify for the full permitting process under 33 U.S.C. § 1344.

3.5 Exemptions from Procedural Requirements – Permits/Approvals and Substantive Requirements

3.5.1 Kitsap County Shoreline Master Plan

The cleanup action will take place within Kitsap County. Ecology will consult with Kitsap County regarding the substantive requirements during the remedial design phase.

3.52 Hydraulic Project Approval Permit (HPAP)

Ecology will consult with the area habitat biologist for the Washington State Department of Fish and Wildlife regarding the substantive requirements for the HPAP during the remedial design phase and will amend this CAP to include those requirements at that time. The amendments will become enforceable requirements under the Consent Decree without the need to amend the Decree. Ecology will also consult with tribal biologists on how to determine the specific fish closure periods.

4 SELECTED CLEANUP ACTIONS

The cleanup actions selected by Ecology for the Site incorporate Bay-wide source control and a combination of removal, capping and EMNR sediment cleanup actions appropriately targeted to different areas within Port Gamble Bay. The selected actions are interdependent and will be sequenced to maximize overall protectiveness, beginning with source control and followed closely in time by intertidal excavation, subtidal dredging, and backfilling. Capping and EMNR will be sequenced to occur after removal actions are completed to maximize control of dredging residuals and to accelerate natural recovery processes, with the goal of reducing the overall restoration time frame to the extent practicable. Figures 4-1 through 4-4 summarize the selected cleanup actions for SMA-1 through SMA-4, respectively. The following sections describe the selected source control and cleanup actions.

4.1 Source Control

Approximately 2,000 creosoted pilings will be removed from throughout the Bay as a source control measure for protection of human health and to facilitate access for subsequent dredging and capping. While most of the creosoted pilings to be removed are located within or adjacent to North and South Mill (see Figures 4-1 and 4-2), concurrent creosoted piling removal will also occur in other areas of Port Gamble Bay such as the Log Transfer Dock and log staging and rafting areas. PR/OPG will concurrently remove approximately 73,000 square feet of existing overwater structure (subject to more accurate delineation as needed during the engineering design study) within Mill North and Mill South and remove the Log Transfer Dock and pilings from staging and rafting areas throughout the Bay. All piling removal will also be sequenced to occur shortly before dredging or capping actions to maximize control of piling removal residuals.

Pilings will be removed using best efforts, equipment preferences and best management practices (BMPs) identified in the (1) statewide *Hydraulic Project Approval (HPA) - Creosote Piling and Structural Removal* (WDFW 2011) and (2) the DNR *Puget Sound Initiative – Derelict Creosote Piling Removal, BMPs for Pile Removal and Disposal* (DNR 2011). Areas of moderate to extensive piling removal not otherwise anticipated to be later capped or dredged will be covered with 6 inches of sand to control piling removal residuals.

4.2 Intertidal Sediment Excavation and Capping

Approximately 10,000 to 15,000 cy of intertidal sediments in portions of the North Mill (SMA-1) and South Mill (SMA-2) that exceed Puget Sound natural background levels will be excavated (likely using upland-based equipment operating during relatively low tidal conditions) to approximately 2 feet below the existing sediment surface, and backfilled with a suitable cap or appropriate substrate if capping is determined not necessary during the Engineering Design Study. Approximate intertidal sediment removal areas in SMA-1 and SMA-2 are depicted in Figures 4-1 and 4-2, respectively. Ecology will determine the final horizontal and vertical extents of intertidal sediments to be removed in these SMAs after final delineation is completed during remedial design. In addition, subsurface wood waste deposits that may potentially be present in these intertidal areas will also be evaluated during remedial design. Significant deposits of subsurface wood waste or contaminants that are encountered during design or construction will be fully addressed by the remedy design to meet the cleanup action objectives summarized in Section 3.3 and as described below. Remediation levels defining a significant subsurface deposit will be defined during remedial design.

Excavated material will be screened to remove debris, and the screened sediments sorted as appropriate to facilitate reuse or disposal in upland areas within or near the Mill, as allowed. Screening-level sampling and testing conducted by OPG/PR of intertidal sediments from SMA-1 and SMA-2 suggests that dioxins/furans and/or cPAH concentrations in some of the excavated intertidal sediments may exceed MTCA soil cleanup levels, and will be further screened for appropriate reuse or disposal options during remedial design. Detailed upland beneficial reuse and institutional control plans will be developed during remedial design. If no other allowed reuse or disposal alternatives are identified, the excavated material will be disposed at an approved upland disposal facility.

The final intertidal excavation and backfill/capping plans will be developed during the remedial design phase subject to Ecology approval. The intertidal excavation and backfill/capping designs will be developed to control contaminant exposure to humans and the environment and to provide suitable habitat for benthic organisms and forage fish. Excavated areas will be backfilled/capped to restore the existing grade. The thickness and

composition of the caps will be designed to minimize exposure to humans during shoreline activities (e.g., shellfishing, recreation), and are anticipated to be approximately 2 feet thick or as Ecology determines is necessary to address exposure. All backfill/capping materials will come from a source approved by Ecology and will have suitable geotechnical characteristics. The cap will be designed to isolate contaminants and provide habitat using materials that will support a healthy benthic, shellfish, and forage fish community.

4.3 Subtidal Sediment Dredging and Backfilling

Approximately 30,000 to 45,000 cy of nearshore sediments with surface sediment toxicity exceeding SQS biological criteria (Table 3-1) that are underlain by wood waste deposits with TVS concentrations exceeding 15 percent will be dredged from portions of the North Mill (SMA-1) and South Mill (SMA-2). Subsequently, the dredged areas will be backfilled and/or capped, including placement of a nominal 6 inches of sand to control dredging residuals.

Approximate subtidal sediment removal areas in SMA-1 and SMA-2 are depicted in Figures 4-1 and 4-2, respectively. The final horizontal and vertical extents of sediments to be dredged from SMA-1 and SMA-2 will be determined by Ecology after being delineated during remedial design, supplementing existing data as necessary. The final dredge prisms for SMA-1 and SMA-2 will be developed also considering engineering and implementability constraints such as slope stability and cultural resource protection requirements.

Prior geophysical survey and sediment coring work performed in SMA-1 identified a concentrated shallow subtidal deposit of wood chips within the footprint of the former chip loading facility. This deposit is located directly below surface sediments containing elevated porewater sulfide concentrations. Removal of wood chip deposits exceeding a TVS concentration of 15 percent is the goal of the SMA-1 dredging action. Anticipated post-dredge surface sediments with dredging residuals exceeding a TVS concentration of 15 percent will be managed by placing a post-dredge sand cover over the dredge area.

Similarly, dredging actions in SMA-2 will target removal of sediments exceeding a TVS concentration of 15 percent at elevations shoreward of the approximate -20 feet MLLW contour, to focus dredging within the more productive photic zone and also to target the

zone of elevated sulfide concentrations, subject to final design based on engineering and cultural resources considerations. Anticipated post-dredge surface sediments with dredging residuals exceeding a TVS concentration of 15 percent will be managed by either placing a post-dredge sand cover over the dredge area or by placement of a sand cap, considering engineering and implementability constraints such as slope stability and cultural resource protection requirements. Subject to final design evaluations, wood waste deposits waterward of the approximate -20 feet MLLW contour will be capped (see Section 4.5).

A portion of the dredge sediments generated from the North Mill (SMA-1) and South Mill (SMA-2) are prospectively considered suitable for open-water disposal at a non-dispersive, unconfined DMMP open-water disposal site. Provided that large wood debris is appropriately screened, it is expected that the DMMP agencies will permit some or all of the SMA-1 and/or SMA-2 wood debris to be disposed of in a suitable open-water disposal location.

The use of open-water disposal for dredge material is evaluated on a case-by-case basis, and future suitability determinations can be subject to evolving policy issues related to sediment chemistry. SMA-1 sediments underwent a preliminary screening that suggests these sediments would pass the open-water disposal suitability determination, including for dioxins/furans. Similarly, SMA-2 sediments were screened against DMMP criteria as part of preliminary sampling performed by OPG/PR. In developing alternatives and associated costs, it was assumed that roughly 80 percent of SMA-1 and approximately 50 percent of SMA-2 dredged sediments would be suitable for open-water disposal under the selected remedy.

Additional characterization of these sediments will be required to confirm the use of open-water disposal. Sampling and characterization in accordance with DMMP protocols will be performed for specific areas identified in SMA-1 and SMA-2. Formal DMMP suitability determinations will be performed during remedial design. Sediment that is determined by the DMMO to be suitable for open-water disposal will be transported by barge and disposed of at a suitable open-water disposal site such as the Port Gardner non-dispersive DMMP disposal site after larger wood and debris greater than 2 feet in any dimension is removed.

Dredged material that is unsuitable for open-water disposal will be beneficially reused on uplands on or near the Mill as practicable. Screening-level sampling and testing conducted by OPG/PR of subtidal sediments in the SMA-1 and SMA-2 dredge areas suggests that dioxins/furans and/or cPAH concentrations in some of the excavated intertidal sediments may exceed MTCA soil cleanup levels, and will be further screened for appropriate reuse or disposal options during remedial design. Detailed upland beneficial reuse plans will be developed during remedial design. If no other allowed reuse or disposal alternatives are identified, the excavated material will be disposed of at an approved upland disposal facility. Potential disposal options for these materials will be finalized during remedial design.

4.4 Subtidal Sediment Capping

Approximately 7 acres of sediments in the Mill Site South (SMA-2) offshore of approximately -20 feet MLLW with surface sediment toxicity exceeding SQS biological criteria (Table 3-1) and also with underlying sediment TVS concentrations exceeding 15 percent will be contained with an approximate 4-foot-thick cap. The thickness and composition of the cap will be designed to provide 3 feet of clean sediment and an additional 1 foot of buffer between surface sediment geoduck habitat and underlying wood waste deposits in this area. The final cap specification will be determined during remedial design. Beneficial reuse of clean navigational dredge material is the preferred source of the cap material, using materials that will support healthy benthic, shellfish, and forage fish communities, including geoduck. The preliminary extent of the SMA-2 cap is depicted on Figure 4-2. Ecology will determine the final extent of the SMA-2 cap after final delineation is completed during remedial design.

Approximately 3 acres of shallow subtidal sediments in the North Mill (SMA-1) with surface sediment toxicity exceeding SQS biological criteria (Table 3-1) but without significant underlying wood waste accumulations (TVS less than 15 percent) will be capped with an approximate 1-foot-thick cap. The extent of the SMA-1 sediment cap is depicted on Figure 4-1. Material selected will ensure support for healthy benthic, shellfish, and forage fish communities.

Grain size and other engineering specifications for the cap material will be determined during remedial design, following relevant design guidance (e.g., Palermo et al. 1998) and in consultation with natural resource agencies for habitat considerations.

4.5 Subtidal Sediment Enhanced Monitored Natural Recovery (EMNR)

Six inches of EMNR materials will be placed over roughly 100 acres of subtidal sediments in parts of the South Mill (SMA-2), Central Bay (SMA-3), and FLA (SMA-4) with surface sediment toxicity exceeding SQS biological criteria (Table 3-1) but without significant wood waste accumulations (underlying sediment TVS less than 15 percent). The 2007 interim dredging action performed in SMA-2 will also receive a 6-inch-thick EMNR layer (Figure 4-2).

Material selected will ensure that the rate of natural recovery is enhanced, reduce concentrations of conventional and wood waste breakdown contaminants, and achieve a healthy benthic community.

EMNR placement will be sequenced such that placement in SMA-2 will precede work at SMA-4 and subsequently in SMA-3.

The preliminary extents of EMNR areas in SMA-2, SMA-3, and SMA-4 are depicted on Figures 4-2 through 4-4, respectively. The EMNR areas will be further refined during remedial design and as part of adaptive management during initial construction phases to reflect ongoing natural recovery processes. EMNR may not be required in those areas that pass SMS biological criteria (Table 3-1) during remedial design delineation sampling.

4.6 Subtidal Sediment Monitored Natural Recovery

Monitored natural recovery is selected as the remedy for SMA-5 where active remediation will not be conducted (i.e., all of SMA-5 outside the boundaries of SMA's 1 to 4). The sampling scope and schedule to assess the rate of natural recovery will be determined, subject to Ecology approval, during the remedial design phase and will include contingency plans and triggers for implementation of active remedial measures if required. Where monitored natural recovery does not achieve cleanup standards in ten years, PR/OPG will comply with

sediment recovery zone requirements. These requirements will be added to this CAP by amendment. The amendment will be issued for public notice and comment. The amendment's requirements will become enforceable under the Consent Decree without an amendment to the Decree.

4.7 Compliance Monitoring

Compliance monitoring will be performed to verify that construction actions achieve remedial design objectives and to verify the short- and long-term effectiveness of the selected remedy. For example, creosoted piling removal along with the dredging, capping, and EMNR cleanup actions described above will eliminate the major sources of contaminants to this area, which is anticipated to accelerate natural recovery over time.

Prior dredging experience at the Mill has demonstrated that it may be difficult to achieve design cut elevations in areas of closely-spaced, broken or buried pile stubs. Once required excavation or dredging elevations have been verified as outlined above, performance monitoring will involve collecting sediment samples from the base of the excavations or dredge areas to confirm that cleanup levels have been achieved and/or to document concentrations of residual contaminants. Performance monitoring activities will include the following:

- Collection of composite samples from the final limits of the sediment excavations and dredge prisms, with the sampling density appropriately tailored to the location and size of the removal area (detailed post-construction verification sampling plans will be developed during remedial design)
- The confirmatory sediment samples will be submitted for analysis of PAHs, dioxins/furans, cadmium, and/or TVS as appropriate for each remedial action area, to verify that the removal actions are complete or to document dredging residual concentrations that will be addressed by post-dredge sand placement
- Samples will be analyzed on a short turnaround basis to allow the results to be compared with sediment cleanup levels shown in Table 3-1 to evaluate whether the final limits of the remedial excavations have been achieved

Compliance monitoring requirements are described in more detail in Section 7 of this CAP.

5 ALTERNATIVES CONSIDERED AND BASIS FOR REMEDY SELECTION

A range of potential cleanup action alternatives for each SMA was evaluated in the PRI/FS. This section summarizes the cleanup technologies and alternatives considered and the basis for the selected remedy.

5.1 Cleanup Technologies

The PRI/FS report presents a detailed screening evaluation of potentially applicable general response actions and remediation technologies. Cleanup action alternatives were developed by assembling the technologies that were carried forward from this screening evaluation, including dredging, capping, EMNR, monitored natural recovery (MNR), and combinations of these remedial technologies consistent with EPA (2005).

5.2 Feasibility Study Alternatives

The PRI/FS report presents a detailed evaluation of a range of potential cleanup action alternatives for SMA-1 through SMA-5, as follows:

- SMA-1
  - Dredge
  - Dredge and Cap (selected remedy)
  - Cap
  - Cap and EMNR
- SMA-2
  - Dredge
  - Dredge and Cap
  - Dredge and Cap II
  - Dredge, Cap and EMNR (selected remedy)
  - Cap
  - Cap and EMNR
- SMA-3
  - Dredge

  - Cap
  - EMNR (selected remedy)
  - MNR
- SMA-4
  - Dredge
  - Cap
  - EMNR (selected remedy)
  - MNR
- SMA-5
  - Dredge
  - Cap
  - EMNR
  - MNR (selected remedy)

The evaluations of each alternative are summarized in Section 5.3 below.

5.3 Summary of Detailed Analysis of Alternatives

This section provides a narrative description of the evaluation and comparison of these alternatives for each SMA. Each alternative was evaluated relative to the following SMS and MTCA criteria:

- Threshold criteria of protection of human health and the environment, and attainment of cleanup standards
- Short-term effectiveness
- Long-term effectiveness
- Implementability
- Cost
- Community concerns
- Recycling and Waste Minimization
- Environmental Impacts

For each alternative, an absolute numeric ranking ranging from 1 to 5 was assigned, where 1 is the lowest (least favorable) ranking and 5 is the highest (most favorable) ranking. These absolute rankings were weighted to calculate a total score for each alternative. Table 5-1 summarizes the evaluation and tabulates the overall score for each alternative.

5.3.1 North Mill (SMA-1) Detailed Evaluation

5.3.1.1 Threshold Evaluation

All of the alternatives evaluated for SMA-1 meet the SMS threshold criteria of protection of human health and the environment, and attainment of cleanup standards. Each alternative was configured to meet the required cleanup standards, and all alternatives would meet the cleanup standard within a 10-year time frame. Cleanup will be achieved in compliance with applicable laws.

5.3.1.2 Short-term Effectiveness

For the Dredge alternative, short-term effectiveness was given a score of 3 for human health and 4 for environment, for an average score of 3.5. This scoring reflects the relatively large volume of material that needs to be handled in this alternative and the potential risks to human health associated with this work, as well as generated dredge residuals.

For the Dredge and Cap alternative, less material is removed, with less attendant human health risk during implementation. At the same time, dredge residuals will still result in environmental impact. Thus, this alternative was given a score of 4 for human health, and 4 for environment, for an average score of 4.0.

The Cap alternative does not require upland management of dredge material and debris, and thus represents the lowest potential risk to human health. However, there are water quality impacts associated with placing a large volume of capping material, which represents a short-term environmental risk. Thus, this alternative ranks 5 for human health, and 4 for environment, for an overall average of 4.5.

Table 5-1

Remedial Alternatives Evaluation Matrix

		Protection of Human Health and the Environment[a]			Attainment of Cleanup Standards and Compliance with Laws[b]		Short-term Effectiveness[c]			Long-term Effectiveness[d]					Ability to be Implemented[e]				Cost[f]	Community Concerns[g]	Recycling, Reuse, Waste Min.[h]	Environmental Impacts[i]	
SMA	Alternative	Human Health	Environment	Time to Achieve Standards	Cleanup Standards	Applicable laws	Human Health	Environment	Score	Environment	Human Health	Certainty and Reliability	Residual Risks	Score	Technical Feasibility	Availability of Materials, Land, etc.	Permitting and Regulatory	Score	Estimated Average Cost Score	Score	Score	Score	Total Score
Mill North	1 - Dredge	Y	Y	Y	Y	Y	3	4	3.5	5	5	4	4	4.5	4	5	5	4.7	1	5	2	4	69
	2 - Dredge and Cap	Y	Y	Y	Y	Y	4	4	4.0	5	5	4	3	4.3	4	5	5	4.7	2	3	3	4	72
	3 - Cap	Y	Y	Y	Y	Y	5	4	4.5	4	5	3	3	3.8	5	5	5	5.0	3	1	3	4	75
	4 - Cap and EMNR	Y	Y	Y	Y	Y	5	5	5.0	3	5	2	2	3.0	5	5	5	5.0	3	1	3	4	71
Mill South	1 - Dredge	Y	Y	Y	Y	N	1	1	1.0	5	5	4	4	4.5	3	2	4	3.0	1	5	2	1	54
	2 - Dredge and Cap	Y	Y	Y	Y	Y	2	1	1.5	5	5	4	3	4.3	3	3	5	3.7	1	4	3	3	58
	3 - Dredge and Cap II	Y	Y	Y	Y	Y	3	2	2.5	4	5	4	3	4.0	4	4	5	4.3	2	3	4	3	66
	4 - Dredge, Cap, and EMNR	Y	Y	Y	Y	Y	4	4	4.0	4	5	4	3	4.0	4	4	5	4.3	3	2	4	4	74
	5 - Cap	Y	Y	Y	Y	Y	5	5	5.0	4	5	3	3	3.8	5	4	5	4.7	4	1	5	3	80
	6 - Cap and EMNR	Y	Y	Y	Y	Y	5	5	5.0	3	5	2	1	2.8	5	4	5	4.7	4	1	5	4	75
Central Bay	1 - Dredge	Y	Y	Y	Y	N	1	1	1.0	5	5	2	4	4.0	2	1	2	1.7	2	2	2	1	48
	2 - Cap	Y	Y	Y	Y	Y	5	3	4.0	4	5	4	3	4.0	4	3	5	4.0	5	3	5	2	83
	3 - EMNR	Y	Y	Y	Y	Y	5	5	5.0	3	5	4	2	3.5	5	4	5	4.7	5	4	5	3	87
	4 - MNR	N	N	N	N	N	1	1	1.0	2	1	1	1	1.3	5	5	5	5.0	5	1	1	5	62
FLA	1 - Dredge	Y	Y	Y	Y	Y	1	1	1.0	5	5	5	4	4.8	3	3	5	3.7	2	4	2	3	64
	2 - Cap	Y	Y	Y	Y	Y	5	4	4.5	4	5	5	3	4.3	4	5	5	4.7	5	4	5	4	91
	3 - EMNR	Y	Y	Y	Y	Y	5	5	5.0	4	5	4	3	4.0	5	5	5	5.0	5	3	5	4	91
	4 - MNR	N	N	N	N	N	1	1	1.0	2	1	1	1	1.3	5	5	5	5.0	5	1	1	5	62
Background	1 - Dredge and MNR	N	Y	N	N	N	1	1	1.0	3	2	2	4	2.8	2	1	2	1.7	2	1	2	1	39
	2 - Cap and MNR	N	Y	N	N	N	2	2	2.0	3	2	3	3	2.8	3	2	4	3.0	5	2	5	2	67
	3 - EMNR and MNR	N	Y	N	N	N	2	3	2.5	4	2	2	2	2.5	4	3	5	4.0	5	2	5	3	71
	4 - MNR	N	Y	N	N	N	1	5	3.0	5	1	1	1	2.0	5	5	5	5.0	5	1	1	5	70

Notes:

Does not meet threshold criteria
Highest scoring alternatives (within a few points)
Draft preferred alternative

1 = Low
2 = Low-medium
3 = Medium
4 = Medium-high
5 = High

EMNR = enhanced, monitored natural recovery
FLA = former lease area
MNR = monitored natural recovery
SMA = Sediment Management Area

a = Overall protection of human health and the environment, time required to attain the cleanup standard(s), and on-site and off-site environmental impacts and risks to human health resulting from implementing the cleanup alternatives.
b = Attainment of the cleanup standard(s) and compliance with applicable federal, state, and local laws.
c = Short-term effectiveness, including protection of human health and the environment during construction and implementation of the alternative.
d = Long-term effectiveness, including degree of certainty that the alternative will be successful, long-term reliability, magnitude of residual biological and human health risk, and effectiveness of controls for ongoing discharges and/or controls required to manage treatment residues or remaining waste cleanup and/or disposal site risks.
e = Ability to be implemented, including the potential for landowner cooperation, consideration of technical feasibility, availability of needed off-site facilities, services and materials, administrative and regulatory requirements, scheduling, monitoring requirements, access for construction, operations and monitoring, and integration with existing facility operations and other current or potential cleanup actions.
f = Cost, including consideration of present and future direct and indirect capital, operation, and maintenance costs and other foreseeable costs.
g = The degree to which community concerns are addressed.
h = The degree to which recycling, reuse, and waste minimization are employed.
i = Environmental impact. Sufficient information shall be provided to fulfill the requirements of the State Environmental Policy Act. Discussions of significant short-term and long-term environmental impacts, significant irrevocable commitments of natural resources, significant alternatives including mitigation measures, and significant environmental impacts which cannot be mitigated shall be included.

The Cap and EMNR alternative entails handling the lowest volume of material, and thus has the lowest attendant risks to both human health and the environment. This alternative scored 5 for both human health and the environment, for an overall average score of 5.0.

5.3.1.3 *Long-term Effectiveness*

The long-term effectiveness of the Dredge alternative ranks high for protection of human health and the environment because source material is removed to the maximum extent practicable. Because of generated dredge residuals, this alternative ranks marginally lower for certainty and reliability, and residual risks. This alternative was scored 5 for human health, 5 for environment, 4 for certainty/reliability, and 4 for residual risks, for an average score of 4.5.

The Dredge and Cap alternative has a similar ranking to the Dredge alternative; however, the residual risk category ranks lower because of the reliance on caps to prevent exposure to material that remains in the environment. Thus, the scoring is 5, 5, 4, 3 for human health, environment, certainty/reliability, and residual risk, respectively, for an overall average of 4.3.

The Cap alternative is protective of human health because the exposure pathway to sediments is removed; a score of 5 was assigned. Because the benthic community will reside within the cap matrix and there remains a lower risk of toxicity due to sulfides from decomposing wood waste (though the caps would be designed to address this risk), environment ranks slightly lower compared to human health, and was scored 4. Because institutional controls are required, capping has lower certainty/reliability compared to removal, and was scored 3. Similar to the Dredge and Cap alternative, residual risk was also scored 3, for an overall average score of 3.8 for long-term effectiveness.

The Cap and EMNR alternative is similar to the Cap alternative and ranks 5 for protection of human health. However, the reliance on EMNR in parts of the SMA results in a lower score of 3 for environment because of the potential for benthic exposure before natural recovery processes have reduced concentrations below criteria. EMNR presumes ongoing natural recovery following placement of clean sand, and thus is less certain (until a demonstration is made through long-term monitoring) than capping, so certainty has been scored 2.

Similarly, residual risk ranks 2 because of the reliance on EMNR in portions of the SMA. The overall average score for long-term protectiveness is 3.0 for the Cap and EMNR alternative.

5.3.1.4 Implementability

The technical feasibility of the Dredge alternative was given a score of 4 in consideration of the amount of material handled, and the need to process debris and unsuitable dredge material in an available upland location. Materials and equipment for dredging are commonly available, and this criterion was scored 5. Finally, dredging projects are routinely permitted in Puget Sound and have the support of regulatory agencies when performed in conjunction with cleanup, and thus this criterion scored 5. The overall average implementability score for the Dredge alternative is 4.8.

The Dredge and Cap alternative is the same as the Dredge alternative from an implementability standpoint, and the same considerations and scoring are applied. The implementability average score for this alternative is also 4.8.

Capping ranks higher for technical feasibility compared to dredging because there would be less need for upland sorting or processing of excavated material. Thus, the Cap alternative was scored 5 for technical feasibility. Capping materials and equipment are commonly available, and thus this criterion was also scored 5. Finally, as with dredging, there is regulatory and permitting support for capping performed during environmental cleanup, and this criterion scored 5 as well, for an overall average score of 5.0 for implementability.

The Cap and EMNR alternative has the same considerations as the Cap alternative and was thus scored the same, with an overall average score of 5.0.

5.3.1.5 Cost

The Dredge alternative in SMA-1 has the highest estimated cost ($1.1 million/acre) and the lowest rank, scoring 1. The Dredge and Cap alternative is estimated to cost $900,000/acre and has a score of 2. The Cap and Cap and EMNR alternatives are estimated to cost $700,000/acre, and have been given a score of 3 for cost.

5.3.1.6 Community Concerns

As this is one of the smaller SMAs with relatively few existing shellfish beds that would be impacted by the cleanup, a stronger preference has been expressed for removal (dredging) of as much material as possible. Removal of contaminated sediments also provides the greatest flexibility for future land uses in this area. This preference is reflected in a score of 5 for the Dredge alternative, a score of 3 for the Dredge and Cap alternative, and scores of 1 for the Cap and EMNR alternatives.

5.3.1.7 Recycling and Waste Minimization

The ability for a sediment cleanup project to use recycling and waste minimization is limited to a few key opportunities discussed in Section 5. The Dredge alternative has limited opportunity for recycling or reuse, while at the same time generating waste during excavation, and was thus scored 2. The Dredge and Cap, Cap, and Cap and EMNR alternatives have the potential to beneficially reuse navigationally dredged sand for cap material, and thus all of these alternatives were scored 3 for this evaluation criterion.

5.3.1.8 Environmental Impacts

The potential environmental impacts associated with all alternatives rank equally considering that the scale and scope of each project is similar. The environmental impacts associated with dredge residuals are relatively low due to the relatively low volume of material excavated. The environmental (water quality) impacts associated with cap material placement are also relatively low considering the relatively low volume of material used. Thus, all alternatives were scored 4 for consideration of environmental impacts.

5.3.1.9 Selected Remedy

Based on this evaluation, the Dredge and Cap, Cap, and Cap and EMNR total scores rank highest. The Dredge and Cap alternative was selected due to Ecology's preference for removal of dense wood waste deposits as part of the remedy, particularly in areas with identified sulfide toxicity. The restoration timeframe for the Dredge and Cap alternative is approximately 2 to 3 years for design, permitting, and implementation.

5.3.2 South Mill (SMA-2) Detailed Evaluation

5.3.2.1 Threshold Evaluation

The Dredge alternative meets the threshold criteria for protection of human health and the environment, and achieves cleanup standards within a 10-year time frame. However, a Dredge alternative over this large area is likely to have significant water quality impacts that would be difficult to control. There are also concerns about resuspension and distribution of wood debris and contaminated sediments to other areas of the Bay. For these reasons, this alternative may be more difficult to obtain permits for, and it may also be more difficult to remain in compliance with water quality limits during implementation.

The remaining alternatives evaluated for SMA-2 meet the SMS threshold criteria of protection of human health and the environment, and attainment of cleanup standards. Each of these alternatives has been configured to meet the required cleanup standards, and all of the remaining alternatives will meet the cleanup standard within the required 10-year time frame. Finally, cleanup will be achieved in compliance with applicable laws.

5.3.2.2 Short-term Effectiveness

For the Dredge alternative, short-term effectiveness was given a score of 1 for human health and 1 for environment, for an average score of 1.0. This scoring reflects the significant volume of material that needs to be handled in this alternative, resulting in significant potential risks to human health associated with this work based on documented health and safety issues that show measurable increased worker safety risk for marine construction compared to upland construction. The large volume of dredge material would also result in significant generated dredge residuals and unknown residual distribution and impacts on the rest of the Bay.

For the Dredge and Cap alternative, less material is removed than the Dredge alternative, with less human health risk associated with this action during implementation. However, the overall volume of removal is still significant. Further, significant generated dredge residuals will result in environmental impact. Thus, this alternative was given a score of 2 for human health, and 1 for environment, for an average score of 1.5.

The Dredge and Cap II alternative removes less volume than the Dredge and Cap alternative. Considerations about human health and the environment are similar, but scoring is higher to reflect the lower removal volume, with a value of 3 selected for human health, and 2 for environment, for an overall average score of 2.5.

The Dredge, Cap, and EMNR alternative balances removal and capping such that the dredging is focused on the highest concentration of woody debris in the area most susceptible to generation of porewater sulfide. The result is a lower volume of removal compared to the Dredge and Cap II alternative, and a greater percentage of the dredged material would be suitable for open-water disposal. The dredge prism is also located in an area that is less subject to strong currents. Because of the lower risks associated with the lower volume of removal, human health and environment both score 4, with an overall average of 4.0 for this alternative.

The Cap alternative requires limited upland management of dredge material and debris (from the intertidal excavation area), and thus represents the lowest potential risk to human health. While there may be water quality impacts associated with placing a large volume of capping material, this represents a short-term environmental risk that is lower than the risk of water quality impacts and residuals generation associated with removal. Thus, this alternative ranks 5 for human health, and 5 for environment, for an overall average of 5.0.

The Cap and EMNR alternative entails handling the lowest volume of material, and thus has the lowest attendant risks to both human health and the environment. This alternative scored 5 for both human health and the environment, for an overall average score of 5.0.

5.3.2.3 Long-term Effectiveness

The long-term effectiveness of the Dredge alternative ranks high for protection of human health and the environment because source material is removed to the maximum extent practicable. Because of generated dredge residuals, this alternative ranks marginally lower for certainty and reliability, and residual risks. This alternative was scored 5 for human

health, 5 for environment, 4 for certainty/reliability, and 4 for residual risks, for an average score of 4.5.

The Dredge and Cap alternative has a similar ranking to the Dredge alternative; however, the residual risk category ranks lower because of the reliance on caps to maintain protectiveness. Thus, the scoring is 5, 5, 4, 3 for human health, environment, certainty/reliability, and residual risk, respectively, for an overall average of 4.3.

The Dredge and Cap II alternative has a similar ranking to the Dredge and Cap alternative; however, the environment category ranks slightly lower because less removal is accomplished. Thus, the scoring is 5, 4, 4, 3 for human health, environment, certainty/ reliability, and residual risk, respectively, for an overall average of 4.0.

The Dredge, Cap, and EMNR alternative shares the same considerations and scoring as the Dredge and Cap II alternative, and thus has an overall average score of 4.0 for long-term effectiveness.

The Cap alternative is protective of human health because the exposure pathway to sediments is removed; a score of 5 was assigned. Because the benthic community (and in particular, geoducks) will reside within the cap matrix, environment ranks slightly lower compared to human health, and was scored 4. Because institutional controls are required and there may be a lower risk of continuing sulfides impacts (though the caps would be designed to address this risk), capping has lower certainty/reliability compared to removal, and was scored 3. Similar to the Dredge, Cap, and EMNR alternative, residual risk was also scored 3, for an overall average score of 3.8 for long-term effectiveness.

The Cap and EMNR alternative is similar to the Cap alternative and ranks 5 for protection of human health. However, the reliance on EMNR in parts of the SMA results in a lower score of 3 for environment because of the potential for benthic exposure before natural recovery processes have reduced concentrations below criteria. EMNR presumes ongoing natural recovery following placement of clean sand, and thus is less certain (until a demonstration is made through long-term monitoring) than capping, and thus certainty/reliability has been scored 2. Finally, residual risk ranks 1 because of the reliance on EMNR in portions of the

SMA, and because of the risk posed by the relatively large volume of woody debris that remains under this alternative. The overall average score for long-term protectiveness is 2.8 for the Cap and EMNR alternative.

5.3.2.4 *Implementability*

The technical feasibility of the Dredge alternative was given a score of 3 in consideration of the relatively large amount of material handled, and the need to process debris and unsuitable dredge material in an available upland location. While materials and equipment for dredging are commonly available, the upland space required for processing up to 100,000 to 150,000 cy (representing the 75 percent of SMA-2 material assumed to be unsuitable for DMMP open-water disposal) of dredge material is significant and the ability to manage this volume upland is questionable; thus this criterion was scored 2. The permitting and regulatory criterion was scored 4 because the large volume of dredging could trigger regulatory concerns. The overall average implementability score for the Dredge alternative is 3.0.

The Dredge and Cap alternative is similar to the Dredge alternative from an implementability standpoint, and the same considerations and scoring (3) are applied for technical feasibility. Because the volume of dredge material is lower, the scores for availability of materials and space, as well as the score for regulatory and permitting is slightly higher than the dredge alternative, with scores of 3 and 5, respectively. The implementability average score for the Dredge and Cap alternative is 3.8.

The Dredge and Cap II alternative entails a lower volume of material handled on the upland compared to the Dredge and Cap alternative, and thus has been assigned a higher score of 4 for technical feasibility. Considerations for availability of materials/space, and permitting/regulatory are reduced, and thus a score of 4 was assigned. Finally, a score of 5 was assigned for regulatory/permitting (similar to other small- to medium-scale dredging alternatives) for an overall average score of 4.3.

The Dredge, Cap, and EMNR alternative is similar in scope and scale to the Dredge and Cap alternative, and the scoring for implementability reflects this, with an overall average of 4.3 for this alternative.

Capping ranks higher for technical feasibility compared to dredging because there would be less need for upland sorting/processing of excavated material. Thus, the Cap alternative was scored 5 for technical feasibility. Capping materials and equipment are commonly available; however, a relatively large volume of cap material would be required under this alternative (over 100,000 tons), and thus this criterion was scored 4. Finally, as with dredging, there is regulatory and permitting support for capping performed during environmental cleanup, and this criterion scored 5 as well, for an overall average score of 4.8 for implementability.

The Cap and EMNR alternative has the same considerations as the Cap alternative and similar cap material volume requirements and was thus scored the same, with an overall average score of 4.8.

5.3.2.5 Cost

The Dredge alternative in SMA-2 has the highest estimated cost ($1.6 million/acre) and the lowest rank, scoring 1. The Dredge and Cap alternative is estimated to cost $1.1 million/acre and has also been assigned a score of 1. The Dredge and Cap II alternative is estimated to cost $900,000/acre and has been assigned a score of 2. The Dredge, Cap, and EMNR alternative has an estimated cost of $510,000/acre and has been assigned a score of 3. The Cap and Cap and EMNR alternatives are estimated to cost $370,000/acre, and have been given a score of 4 for cost.

5.3.2.6 Community Concerns

This SMA represents the area most heavily impacted by mill operations over time, and where it has been reported by divers that geoducks have been heavily impacted by wood wastes in sediments. While dredging large volumes of wood waste and impacted sediments may present some challenges and short-term risks to human health and the environment, the long-term gains over multiple generations from cleaning up this area have been stated by community and tribal members as being worth the risks. Therefore, like at SMA-1,

alternatives that result in greater long-term removal (dredging) of contaminated sediments were scored higher. The Dredge alternative received a score of 5; the Dredge and Cap alternative a score of 4; Dredge and Cap II (which dredges lower quantities of sediments) a score of 3; Dredge, Cap, and EMNR a score of 2; and both the Cap and Cap and EMNR alternatives a score of 1.

5.3.2.7 *Recycling and Waste Minimization*

The ability for a sediment cleanup project to use recycling and waste minimization is limited to a few key opportunities discussed in Section 5. As with SMA-1, the Dredge alternative in SMA-2 has limited opportunity for recycling or reuse, while at the same time generating waste during excavation, and was thus scored 2.

The Dredge and Cap alternative has the potential to beneficially reuse sand for cap material, and thus this alternative was scored 3 for this evaluation criterion.

The Dredge and Cap II and Dredge, Cap, and EMNR alternatives are similar to the Dredge and Cap alternative, with the key difference that they would generate less waste from the removal process, and thus these alternatives were scored 4.

Finally, the Cap and Cap and EMNR alternatives produce the least waste and have the highest potential for recycling through the beneficial reuse of maintenance dredge material in the cap, and thus these alternatives both score 5 for this evaluation criterion.

5.3.2.8 *Environmental Impacts*

The potential environmental impacts associated the Dredge alternative are significant. The large volume of material removed (140,000 to 200,000 cy) and associated water quality and dredge residuals impacts would be substantial. Because open-water disposal would only be applicable to a small portion of the dredge material, upland rehandling would result in significant noise, traffic, and local air emissions at the offloading facility and during transloading to the landfill. Marine traffic associated with dredging would interfere with local fishing and shellfish harvest activities for at least 3 years, and noise and light associated with this long-term construction project would cause notable impacts on the local

communities that surround Port Gamble Bay. As a result, the Dredge alternative was given a score of 1 for the environmental impacts criterion.

The Dredge and Cap and Dredge and Cap II alternatives have lower overall dredge volumes and lower impacts associated with dredging. There are additional potential water quality impacts (specifically turbidity) associated with cap material placement that are not associated with dredging, because the volume of material placed is higher under these alternatives than under the Dredge alternative. Thus, these two alternatives were both assigned a score of 3 for environmental impacts.

The Dredge, Cap, and EMNR alternative provides a balanced approach that minimizes impacts associated with dredging, and reduces impacts associated with capping compared to the Cap alternative. Thus, this alternative was assigned a score of 4.

The Cap alternative does not result in dredge-related impacts; however, this alternative does require placement of significant volumes of material for cap construction, and thus has been assigned a score of 3 for environmental impacts.

The Cap and EMNR alternative requires less cap material placement than the Cap alternative and, therefore, scores comparatively higher at 4 for environmental impacts.

5.3.2.9 Selected Remedy

Based on this evaluation, the Dredge, Cap, and EMNR alternative and the Cap alternative total scores rank highest. The Dredge, Cap, and EMNR alternative was selected due to Ecology's preference for removal of large deposits of wood waste as part of the remedy, particularly in areas with identified sulfide toxicity. However, the overall cost of the Dredge, Cap, and EMNR alternative presumes the use of open-water disposal for 50 percent of the dredge material, consistent with OPG/PR's preliminary screening-level sampling. The restoration timeframe for the Dredge, Cap, and EMNR alternative is approximately 3 years for design, permitting, and implementation.

5.3.3 Central Bay (SMA-3) Detailed Evaluation

5.3.3.1 Threshold Evaluation

The Dredge alternative meets the threshold criteria for protection of human health and the environment, and achieves cleanup standards within a 10-year time frame. However, dredging over this large area is likely to have significant water quality impacts that would be difficult to control. There are also concerns about resuspension and distribution of wood debris and contaminated sediments to other areas of the Bay. For these reasons, it may be more difficult to obtain permits for this alternative, and it may also be more difficult to remain in compliance with water quality limits during implementation.

The Cap and EMNR alternatives for SMA-3 meet the SMS threshold criteria of protection of human health and the environment, and attainment of cleanup standards. Each of these alternatives has been configured to meet the required cleanup standards, and these alternatives will meet the cleanup standard within a 10-year time frame. Finally, cleanup will be achieved in compliance with applicable laws for the Cap and EMNR alternatives.

The MNR alternative does not meet the threshold criteria for protection of human health and the environment or attainment of cleanup standards/compliance with laws. Bioassay results currently exceed SQS, and cPAH levels are on the order of 2 to 4 times the cleanup level. Because ongoing natural recovery has not been documented in this SMA and sedimentation rates in the area are very low, this alternative is not expected to meet the cleanup standards within 10 years.

5.3.3.2 Short-term Effectiveness

For the Dredge alternative, short-term effectiveness was given a score of 1 for human health and 1 for environment, for an average score of 1.0. This scoring reflects the substantial volume of dredge material that needs to be managed in this alternative (with approximately twice the volume compared to the Mill Site South Dredge alternative – and similar effectiveness considerations on a larger scale), as well as generated dredge residuals, which will result in a significant environmental impact in the Central Bay.

The Cap alternative does not require upland management of dredge material and debris, and thus represents the lowest potential risk to human health. However, there are water quality impacts associated with placing a large volume of capping material, which represents a short-term environmental risk. Thus, this alternative ranks 5 for human health and 3 for environment, for an overall average of 4.0.

The EMNR alternative entails handling the lowest volume of material, and thus has the lowest attendant risks to both human health and the environment. This alternative scored 5 for both human health and the environment, for an overall average score of 5.0.

Because MNR does not take active measures to improve human health and the environment in the short term, it was scored 1 for both of these criteria, for an overall average of 1.0 for short-term effectiveness.

5.3.3.3 *Long-term Effectiveness*

The long-term effectiveness of the Dredge alternative ranks high for protection of human health and the environment because source material is removed to the maximum extent practicable. However, the scale of the removal would require more than eight construction seasons to complete, which significantly impacts the certainty that the dredging remedy can be completed. Finally, due to generated dredge residuals, this alternative ranks marginally lower for residual risks. This alternative was scored 5 for human health, 5 for environment, 2 for certainty/reliability, and 4 for residual risks, for an average score of 4.0.

The Cap alternative is protective of human health because the exposure pathway to sediments is removed; a score of 5 was assigned. Because the benthic community will reside within the cap matrix, environment ranks lower compared to human health, and was scored 4. Because institutional controls are required, capping has lower certainty/reliability compared to removal, and was scored 4. Similar to the Cap alternatives in the other SMAs, residual risk was also scored 3, for an overall average score of 4.0 for long-term effectiveness.

The EMNR alternative is similar to the Cap alternative and ranks 5 for protection of human health. However, the reliance on EMNR in parts of the SMA results in a lower score of 3 for

environment because of the potential for benthic exposure before natural recovery processes have reduced concentrations below criteria. EMNR presumes ongoing natural recovery following placement of clean sand, and thus is less certain than capping; however, bioassay exceedances are very close to the SQS and so it is reasonable to assume EMNR can be reliable in reducing toxicity to the benthic community. Thus certainty/reliability has been scored 4. Residual risk ranks 2 because of the reliance on natural recovery processes and the fact that material is not removed under this alternative. The overall average score for long-term protectiveness is 3.5 for the EMNR alternative.

Natural recovery is presumed to be occurring very slowly in SMA-3, and thus MNR has been assigned a score of 1 for protection of human health and 2 for protection of the environment because the predominant issue in the Central Bay is exceedance of cPAH levels. Further, MNR is scored 1 for certainty/reliability and 1 for residual risks because active measures are not taken under this alternative. The overall average score for long-term effectiveness of MNR in SMA-3 is 1.3.

5.3.3.4 *Implementability*

The technical feasibility of the Dredge alternative was given a score of 2 in consideration of the significant amount of material handled, and the need to process debris and unsuitable dredge material in an available upland location. Materials and equipment for dredging are commonly available; however, the space required to manage 200,000 to 250,000 cy of dredge material would likely be difficult, if not impossible to find, and thus this criterion was scored 1. Finally, while dredging projects in Puget Sound typically have the support of regulatory agencies when performed in conjunction with cleanup, it is expected that dredging on the scale necessary in SMA-3 for this alternative would create significant concerns, and thus this criterion scored 2. The overall average implementability score for the Dredge alternative is 1.8.

Capping ranks higher for technical feasibility compared to dredging because there would be less need for upland sorting/processing of excavated material. Thus, the Cap alternative was scored 4 for technical feasibility. While capping equipment is commonly available, procuring more than 180,000 tons of cap material for this alternative could be difficult, and

thus this criterion was scored 3. Finally, there is typically regulatory and permitting support for capping performed during environmental cleanup, and this criterion was scored 5, for an overall average score of 4.0 for implementability.

The EMNR alternative has similar considerations to the Cap alternative but ranks higher for technical feasibility and availability of materials because only one-half of the cap material is required under this alternative. Thus, scores were 5, 4, and 5 for technical feasibility, availability of materials and equipment, and permitting/regulatory considerations, respectively, for an overall average score of 4.8.

MNR does not entail active construction. Implementability is related to periodic sampling during each monitoring event. Because it does not trigger any of the technical feasibility, materials availability, or permitting/regulatory issues that occur with active construction, all factors were assigned a score of 5, for an overall average score of 5.0 for implementability.

5.3.3.5 Cost

The Dredge alternative in SMA-3 has the highest estimated cost ($800,000/acre) and the lowest rank, scoring 2. The Cap alternative is estimated to cost $60,000/acre and has been assigned a score of 5. The EMNR alternative is estimated to cost $40,000/acre and has been given a score of 5 for cost. MNR is estimated to cost $5,000/acre in the Central Bay and has been assigned a score of 5.

5.3.3.6 Community Concerns

The Central Bay is a much larger area than those at the mill site, and contains thriving geoduck beds that serve as a recruitment area for the commercial beds to the north. This SMA is also in the center of the Bay and both dredging and capping actions will interfere with fishing over the short term. Balancing these considerations is the need to clean up an area of the Bay in which breakdown products of wood waste have settled and formed flocculant sediments that are undesirable habitat for shellfish, fish, crab, and other biota. Therefore, alternatives received a higher score that would have the potential to improve sediment conditions for biota and remediate contamination while still allowing survival of the existing benthic community and interfering with fishing activities as little as possible.

Based on these considerations, the Dredge alternative received a score of 2. This alternative would require 7 years of dredging operations in the center of the Bay, and would likely resuspend a great deal of flocculent sediments that would settle elsewhere in the Bay. In addition, dredging would destroy the existing geoduck beds and benthic community throughout this area. The Cap alternative received a score of 3. This alternative would have fewer impacts than the Dredge alternative and would require only two capping seasons to carry out. However, the full 1-foot cap envisioned under this alternative would likely kill the existing benthic community, including the geoduck bed, which would require a substantial period of time to become re-established. The EMNR alternative is similar, but uses a 6-inch layer of sediments, which would likely be enough to improve the physical and chemical conditions in sediments without completely eliminating the shellfish and benthic communities. The MNR alternative received a score of 1, because it does not result in any immediate benefit to this area and public comments were received expressing clear dissatisfaction with this approach in the Bay.

5.3.3.7 *Recycling and Waste Minimization*

Similar to SMA-1 and SMA-2, the Dredge alternative in SMA-3 has limited opportunity for recycling or reuse, while at the same time generating waste during excavation, and was thus scored 2 for recycling/waste minimization.

The Cap alternative and the EMNR alternative produce the least waste and have the highest potential for recycling through the beneficial reuse of maintenance dredge material in the Cap, and thus these alternatives both score 5 for this evaluation criterion.

MNR does not entail active construction. There is no opportunity for recycling or waste minimization with this alternative. MNR has been assigned a score of 1 for this criterion.

5.3.3.8 *Environmental Impacts*

The potential environmental impacts associated the Dredge alternative are significant. Dredging over 4 to 8 years would have substantial community impact, with noise, air and light issues affecting the Port Gamble Bay community, disruption of access to fishing and

shellfish harvesting, and significant potential air emissions associated with the marine equipment and offloading/transloading activity for the estimated 200,000+ cy of material that would not be suitable for DMMP open-water disposal. The large volume of material removed, associated water quality and dredge residuals impacts, and community impacts described above result in a score of 1 for this criterion. In addition, dredging would eliminate the benthic community and any shellfish resources in the area remediated.

The Cap alternative does not result in dredge-related impacts; however, this alternative does require placement of significant volumes of material for cap construction, with associated potential for water quality impacts. This alternative also buries the benthic community. Although most elements of the benthic community recover within 2 to 3 years, larger organisms such as geoduck may require long timeframes for recovery. Thus, this alternative has been assigned a score of 2 for environmental impacts.

The EMNR alternative requires less and thinner cap material placement than the Cap alternative and, therefore, scores comparatively higher at 3 for environmental impacts.

Because MNR does not entail construction activities, there are no environmental impacts associated with this alternative. MNR has been assigned a score of 5 for environmental impacts.

5.3.3.9 Selected Remedy

Based on this evaluation, the Cap alternative and EMNR alternative total scores rank similarly, with EMNR ranking highest of the alternatives. Thus, EMNR is the selected alternative for SMA-3. The restoration timeframe for the EMNR alternative is approximately 2 to 3 years for design, permitting, and implementation.

5.3.4 Former Lease Area (SMA-4) Detailed Evaluation

5.3.4.1 Threshold Evaluation

The Dredge, Cap, and EMNR alternatives for SMA-4 meet the SMS threshold criteria of protection of human health and the environment, and attainment of cleanup standards. Each of these alternatives has been configured to meet the required cleanup standards, and

these alternatives will meet the cleanup standard within a 10-year time frame. Finally, cleanup will be achieved in compliance with applicable laws for the Dredge, Cap, and EMNR alternatives.

The MNR alternative does not meet the threshold criteria for protection of human health and the environment or attainment of cleanup standards/compliance with laws. Bioassay results currently exceed SQS, and cPAH levels are on the order of 2 times the cleanup level. Because ongoing natural recovery has not been documented in this SMA, and sedimentation rates in the area are very low, this alternative is not expected to meet the cleanup standards within 10 years.

5.3.4.2 Short-term Effectiveness

For the Dredge alternative, short-term effectiveness was given a score of 1 for human health and 1 for environment, for an average score of 1.0. This scoring reflects the large volume of dredge material that needs to be managed in this alternative and the potential risks to human health associated with this work, as well as generated dredge residuals in a more nearshore shellfish-rich environment, which may result in a significant environmental impact in the FLA.

The Cap alternative does not require upland management of dredge material and debris, and thus represents the lowest potential risk to human health. However, there are water quality impacts associated with placing the capping material, which represents a short-term environmental risk. Thus, this alternative ranks 5 for human health and 4 for environment, for an overall average of 4.5.

The EMNR alternative entails handling the lowest volume of material, and thus has the lowest attendant risks to both human health and the environment. This alternative scored 5 for both human health and the environment, for an overall average score of 5.0.

Because MNR does not take active measures to improve human health and the environment in the short term, it was scored 1 for both of these criteria, for an overall average of 1.0 for short-term effectiveness.

5.3.4.3 Long-term Effectiveness

The long-term effectiveness of the Dredge alternative ranks high for protection of human health and the environment because source material is removed to the maximum extent practicable. The ability to dredge a site of this size has been demonstrated on other projects, and the overall duration is reasonable, making dredging rank high for certainty/reliability. Finally, due to generated dredge residuals, this alternative ranks marginally lower for residual risks. This alternative was scored 5 for human health, 5 for environment, 5 for certainty/reliability, and 4 for residual risks, for an average score of 4.8.

The Cap alternative is protective of human health because the exposure pathway to sediments is removed; a score of 5 was assigned. Because the benthic community will reside within the cap matrix, environment ranks lower compared to human health, and was scored 4. Although institutional controls are required, capping can be completed in a reasonable time frame, and thus certainty/reliability was scored 5. Similar to the Cap alternatives in the other SMAs, residual risk was also scored 3, for an overall average score of 4.3 for long-term effectiveness.

The EMNR alternative is similar to the Cap alternative and ranks 5 for protection of human health. However, the reliance on EMNR in parts of the SMA results in a lower score of 4 for environment because of the potential for benthic exposure before natural recovery processes have reduced concentrations below criteria. EMNR presumes ongoing natural recovery following placement of clean sand, and thus is less certain than capping. Thus, certainty/reliability has been scored 4. Residual risk ranks 3 because of the reliance on natural recovery processes and the fact that material is not removed under this alternative. The overall average score for long-term protectiveness is 4.0 for the EMNR alternative.

Similar to the Central Bay SMA, the FS presumes that natural recovery is occurring very slowly in SMA-4, and thus MNR has been assigned a score of 1 for protection of human health and 2 for protection of the environment. Further, MNR is scored 1 for certainty/reliability and 1 for residual risks because active measures are not taken under this alternative. The overall average score for long-term effectiveness of MNR in SMA-4 is 1.3.

5.3.4.4 *Implementability*

The technical feasibility of the Dredge alternative was given a score of 3 in consideration of the large volume of material handled, and the need to process debris and unsuitable dredge material in an available upland location. Materials and equipment for dredging are commonly available; however, the space required to manage 50,000 to 60,000 cy of dredge material would be significant, and thus this criterion was scored 3. Finally, as with other alternatives, dredging cleanup projects of this scale in Puget Sound typically have the support of regulatory agencies, and thus this criterion scored 5. The overall average implementability score for the Dredge alternative is 3.8.

Capping ranks higher for technical feasibility compared to dredging because there would be less need for upland sorting/processing of excavated material. Thus, the Cap alternative was scored 4 for technical feasibility. Capping equipment is commonly available, and procuring the required volume of cap material for this alternative is feasible, and thus this criterion was scored 5. Finally, there is typically regulatory and permitting support for capping performed during environmental cleanup, and this criterion was scored 5, for an overall average score of 4.8 for implementability.

The EMNR alternative has similar considerations to the Cap alternative but ranks higher for technical feasibility and availability of materials because only one-half of the cap material is required under this alternative. Thus, scores were 5, 5, and 5 for technical feasibility, availability of materials and equipment, and permitting/regulatory considerations, respectively, for an overall average score of 5.0.

MNR does not entail active construction. Implementability is related to periodic sampling during each monitoring event. Because it does not trigger any of the technical feasibility, materials availability, or permitting/regulatory issues that occur with active construction, all factors were assigned a score of 5, for an overall average score of 5.0 for implementability.

5.3.4.5 Cost

The Dredge alternative in SMA-4 has the highest estimated cost ($800,000/acre) and the lowest rank, scoring 2. The Cap alternative is estimated to cost $100,000/acre and has been assigned a score of 5. The EMNR alternative is estimated to cost $70,000/acre and has been given a score of 5 for cost. MNR is estimated to cost $10,000/acre in the FLA and has been assigned a score of 5.

5.3.4.6 Community Concerns

This SMA is also relatively small, and is located along a sloped area where neither substantial intertidal shellfish beds nor major geoduck beds are likely to be impacted by cleanup operations. It is also out of the way of most fishing activities in the Bay. Therefore, based on preferences expressed by the community, alternatives that actively remove or remediate sediments in this SMA received higher scores. The Dredge and Cap alternatives both received a score of 4, the EMNR alternative received a score of 3, and the MNR alternative received a score of 1.

5.3.4.7 Recycling and Waste Minimization

Similar to the other SMAs, the Dredge alternative in SMA-4 has limited opportunity for recycling or reuse, while at the same time generating waste during excavation, and was thus scored 2 for recycling/waste minimization.

The Cap alternative and the EMNR alternative produce the least waste and have the highest potential for recycling through the beneficial reuse of maintenance dredge material in the cap, and thus these alternatives both score 5 for this evaluation criterion.

MNR does not entail active construction. There is no opportunity for recycling or waste minimization with this alternative. MNR has been assigned a score of 1 for this criterion.

5.3.4.8 Environmental Impacts

The potential environmental impacts associated the Dredge alternative are greater than for capping alternatives. The relatively large volume of material removed and associated water quality and dredge residuals impacts result in a score of 3 for this criterion.

The Cap and EMNR alternatives do not result in dredge-related impacts; however, these alternatives do require placement of relatively large volumes of material during construction, with associated potential for water quality impacts, and thus both of these alternatives have been assigned a score of 4 for environmental impacts.

Because MNR does not entail construction activities, there are no environmental impacts associated with this alternative. MNR has been assigned a score of 5 for environmental impacts.

5.3.4.9 Selected Remedy

Based on this evaluation, the Cap alternative and EMNR alternative total scores rank similarly, with EMNR ranking highest of the alternatives. Thus, EMNR is the selected alternative for SMA-4. The restoration timeframe for the EMNR alternative is approximately 2 years for design, permitting, and implementation.

5.3.5 cPAH Background Area (SMA-5) Detailed Evaluation

5.3.5.1 Threshold Evaluation

None of the alternatives for SMA-5 meet the SMS threshold criteria of protection of human health and, therefore, none meet the requirement for attainment of cleanup standards. Consistent with SMS, because no practicable alternative exists to achieve cleanup levels, a technical practicability evaluation was performed for SMA-5. This evaluation is described below.

5.3.5.2 Technical Practicability Evaluation for Background Area (SMA-5)

The Background Area (SMA-5) is characterized by sediments and tissue cPAH concentrations that exceed human health risk criteria. The natural background sediment

and tissue cPAH concentrations also exceed MTCA risk criteria for protection of human health under the exposure scenarios modeled. However, cPAH concentrations in SMA-5 sediments exceed natural background by an order of magnitude.

Ecology selected a cleanup level for cPAHs based on the sediment background threshold value (BTV). BTVs are higher than natural background because they represent a 90 percent confidence interval on the 90th percentile background value. The cleanup level for cPAH was thus selected to be 16 µg/kg dry weight TEQ.

SMS defines the term "practicable" as "able to be completed in consideration of environmental effects, technical feasibility and cost." (WAC 173-204-200(19)). The general response actions of dredging, capping, and EMNR are technically impracticable in SMA-5. Given the scope and size of the SMA, environmental impacts from in-water construction on this scale (dredge residuals, water quality impacts during removal and material placement, impacts to shellfish beds, vessel and vehicle traffic, interference with fisheries, construction noise and light, and air emissions) would be substantial as discussed below, and uses of the Bay would be restricted for long periods of time during remedy implementation. More importantly, however, is that the best outcome that could be anticipated from an active remedy is that only about 30 percent of SMA-5 could be cleaned up to a natural background surface sediment concentration, which itself is higher than risk-based concentrations. Further, upon completion of a dredge, cap, or EMNR action in SMA-5, it is not clear that changes in tissue concentrations would be observable, and they would likely be very small compared to the overall risk.

The following details describe the environmental and community impacts that render dredging, capping, and EMNR impracticable for SMA-5.

5.3.5.3 Dredging Resuspension and Residuals Impacts

As previously discussed, dredging resuspension and residuals releases have been well-documented and would be expected to result in significant impacts to Port Gamble Bay if a dredging remedy were to be implemented in SMA-5. Based on bottom conditions in the

Bay, residuals loss on the order of 2 to 5 percent of the contaminant mass dredged would be expected (Bridges et. al. 2008 and 2012).

5.3.5.4 Capping and EMNR Turbidity Impacts

As has been well-documented on other sediment remediation projects, placement of silt, sand, and gravel under water results in a turbidity plume, even for materials with very low fines content. The magnitude of the turbidity plume is a function of the percent fines, the volume of material placed, and the settling velocity of the cap material. The spread of the plume will vary depending on the settling velocity of the material, as well as prevailing currents and wind during cap/EMNR placement. Because of the number of variables involved, predicting the spread of a turbidity plume during cap/EMNR requires a complicated modeling process.

Widespread turbidity can cause a variety of environmental impacts, including a reduction in light penetration (and reduced photosynthesis), and impacts to adult fish, as well as affecting normal development of bivalve eggs and larva. Although not directly quantifiable, these impacts could potentially be significant, and span a long duration for a capping or EMNR remedial action in SMA-5, which would require placement on the order of 250,000 to 500,000 tons of cap/cover material over a period of 1 to 3 years.

5.3.5.5 Community Impacts

Under any construction scenario for SMA-5, community impacts from noise, light, air emissions, and truck traffic would be significant. Offsite transport and disposal of the 500,000 to 700,000 cy of dredge material would require 50,000 to 70,000 dump truck trips through the Port Gamble community, or wherever else an offloading site would be located. Import of 250,000 to 500,000 tons of cover or cap material from a beneficial reuse source would entail at a minimum 100 large barge trips into the Bay, but more likely on the order of 200 to 500 barge trips based on typical equipment available for a project of this nature, which would inhibit the use of the Bay for fishing and/or shellfish harvesting for anywhere from 1 to 3 years during the construction season. Where an upland quarry is required for cap/cover material, 20,000 to 40,000 truck trips would be needed to deliver the material.

Besides the direct community impacts during construction, related indirect impacts such as infrastructure wear and tear (e.g. pavement damage) would require additional mitigation upon completion of the SMA-5 remedial action.

5.3.5.6 *Technical Practicability Conclusions*

Based on the environmental and community impacts, logistical considerations, and overall feasibility of conducting a large scale remedy in the Port Gamble Bay community, dredging, capping, and EMNR remedies are technically impracticable in SMA-5. Environmental impacts from dredging resuspension/residuals and turbidity from capping and EMNR would be significant. Community impacts such as air emissions, noise, light, and general community disruption would also be substantial.

As with active remedial measures, natural recovery processes are expected to result in a reduction in Site-wide cPAH concentrations over time, particularly after cPAH sources such as creosoted piles are removed during the remedial action. Recovery of SMA-5 will be monitored over time under the MNR alternative.

6 IMPLEMENTATION OF THE CLEANUP ACTION

Remedial design will begin with development of a Remedial Design and Adaptive Management Work Plan, a Cultural Resources Assessment Plan (Appendix B), and concept-level engineering designs (generally 30 percent design) sufficient to complete a Joint Aquatic Resources Permit Application (JARPA). Permitting and engineering design schedules accommodate initiation of remedial actions in summer 2015.

Appropriate sequencing of remedial actions and adaptive management are important elements of the selected remedy for Port Gamble Bay. As discussed in Section 4, the selected actions are interdependent and will be sequenced to maximize overall protectiveness, as well as short term effectiveness. Sequencing considerations include beginning with source control, followed closely in time by intertidal excavation, subtidal dredging, and backfilling. Capping and EMNR will be sequenced to occur after removal actions are completed to maximize control of dredging residuals and to accelerate natural recovery processes, with the goal of reducing the overall restoration time frame to the extent practicable and maximizing short term effectiveness.

The selected remedy assumes that, where practicable, cap, cover, and residuals management materials may largely be obtained from a beneficial reuse maintenance event when clean sediment with the appropriate grain size is available. Based on history, large volumes of this type of material are only periodically dredged in Puget Sound. Alternatively, smaller volumes from local maintenance dredge projects (marinas, etc.) may be available in any given year. PR/OPG will be required to seek alternate sources if obtaining dredged materials will prevent the cleanup from concluding in a reasonable timeframe, which will be defined during remedial design.

There are considerable advantages associated with sequencing the implementation of the sediment cleanup remedy, allowing for an adaptive management strategy to be used during the cleanup process. Because implementation is expected to occur within an approximate 3-year period, the opportunity exists to collect interim data to gauge the rate and success of natural recovery processes. At the same time, it is desirable to use suitable clean material as

it becomes available (whether small or large volumes) to avoid missing opportunities. Appropriate sequencing can be accomplished in several ways:

1. Discrete capping, EMNR, and/or residual management areas can be selected for completion in any given year, and all of the available beneficial reuse material generated during that year would be dedicated to one or more SMAs. The advantage of this approach is that an SMA could be considered effectively "finished" and long-term monitoring of that SMA could be initiated. The disadvantage of this approach is that other SMAs that cannot be completed in a given year would remain unaddressed until a future construction season.
2. Wide areas could be addressed, with a thinner placement of material in a series of lifts that are completed as material comes available. This approach would allow interim monitoring to occur to gauge the effectiveness of the remedy as it is implemented. It could be determined that the initial thinner lifts (similar to EMNR) within a capping area have sufficiently addressed benthic and human health risk, and the adaptive management approach could ultimately result in a different final remedy for that area. This approach would also cover a wider area with the available material, at least partially addressing exposure over a greater footprint. Finally, this approach would cause less benthic disturbance and short-term environmental impact, as the benthic community is less likely to be damaged with thinner lifts of material, which would allow the community time to adapt before the next placement of material. The disadvantage of this approach is that larger areas of Port Gamble Bay would remain "unfinished" until adaptive management endpoints are met and/or full placement of the design thickness of material is achieved.

The Remedial Design and Adaptive Management Work Plan will describe in detail the phasing of implementation of the sediment cleanup remedy, including the adaptive management strategy to be used during implementation of the sediment cleanup remedy.

Appendix A contains an outline of the required schedule for completing remedial design and implementation activities.

Appendix B is the existing Cultural Resources Assessment Plan which provides an overview of cultural resources assessment and consultation activities that will inform the design and permitting of the cleanup and restoration actions, along with development of study plans and inadvertent discovery provisions during implementation of the actions, consistent with state and federal requirements.

Consistent with Chapter 70.105D RCW, as implemented by Chapter 173-340 WAC (MTCA Cleanup Regulation), Ecology has determined that the selected sediment cleanup action described in Section 4 of this CAP is protective of human health and the environment, will attain federal and state requirements that are applicable or relevant and appropriate, complies with cleanup standards, and provides for compliance monitoring. The selected cleanup action satisfies the preference expressed in WAC 173-340-360 for the use of permanent solutions to the maximum extent practicable, and provides for a reasonable restoration timeframe.

7 COMPLIANCE MONITORING

Compliance monitoring and contingency responses (as needed) will be implemented in accordance with WAC 173-340-410, Compliance Monitoring Requirements. OPG/PR will comply with detailed requirements in the Construction Quality Assurance Plan (CQAP) and Operations, Maintenance, and Monitoring Plan (OMMP) to be prepared as a part of the remedial design. The objective of these plans is to confirm that cleanup standards have been achieved, and also to confirm the long-term effectiveness of cleanup actions in Port Gamble Bay. The plans will contain discussions on duration and frequency of monitoring, the trigger for contingency response actions, and the rationale for terminating monitoring. The three types of compliance monitoring to be conducted include:

- Protection Monitoring to confirm that human health and the environment are adequately protected during the construction period of the cleanup action
- Performance Monitoring to confirm that the cleanup action has attained cleanup standards and other performance standards
- Confirmation Monitoring to confirm the long-term effectiveness of the cleanup action once performance standards have been attained

Cleanup levels and associated points of compliance for the cleanup action are described above in Section 3.

7.1 Monitoring Objectives and Rationale

Monitoring to determine whether cleanup standards have been achieved during and after the cleanup action is required. OPG/PR will undertake three broad categories of compliance monitoring at the Site as follows:

- Water Quality (Protection and Confirmation Monitoring) – During the cleanup action, construction controls and protection monitoring will be implemented as practicable to ensure surface water quality protection within Port Gamble Bay. Detailed monitoring and contingency response requirements will be described in the CQAP and OMMP to be prepared as a part of remedial design as approved by Ecology.

- Physical Limits and Integrity (Performance and Confirmation Monitoring) – As discussed in Section 4.7, bathymetric performance monitoring will be conducted during the cleanup action to guide the limits of construction activities. Following completion of construction, physical confirmation monitoring of sediment cap surfaces will be performed to verify that caps are not substantially eroded over time by natural and/or anthropogenic forces. During these confirmation monitoring events, sediment cap thickness will be assessed and compared with the minimum required thickness determined during remedial design to ensure integrity of the caps to protect human health and the environment (Palermo et al. 1998). Again, detailed monitoring and contingency response requirements will be described in the CQAP and OMMP to be prepared as a part of remedial design.
- Sediment Quality (Performance and Confirmation Monitoring) – As discussed in Section 4.7, once required excavation or dredging elevations have been verified, performance monitoring will involve collecting representative composite sediment samples from the base of excavations to certify that cleanup and remediation levels have been achieved and to document concentrations of contaminants remaining on site. The certification sample composites will be comprised of a minimum of 5 multi-increment subsamples to address small-scale heterogeneity in sediment chemical concentrations resulting from environmental sampling and analysis (e.g., see EPA 2011). The size of the compositing areas at the base of the excavations will be defined in the CQAP (prepared during remedial design), and are anticipated to represent approximately 2 to 3 days of removal construction work (e.g., corresponding to roughly 50 to 100 lineal feet of shoreline in the intertidal excavation areas). If certification samples exceed remediation levels at the base of excavation areas, analysis of the data will be performed to assess the extent and degree of exceedance. Following Ecology approval, response actions will be implemented as appropriate, including but not limited to:
  - No further action (i.e., cleanup determined to be successful within a given certification area)
  - Additional wood waste and/or chemical sampling to further characterize residual contamination within and/or adjacent to the excavation and dredge areas

  - Placement of a clean sand cover as necessary to address identified sediment residuals
  - Placement of a confining cap layer or backfill to achieve isolation of underlying contaminants
  - Supplemental excavation or dredging to remove contaminated sediments or wood waste or miscellaneous debris, followed by additional post-construction performance sampling, as appropriate

- Following completion of construction, confirmation monitoring of surface sediments within the cap areas will be conducted. Chemical monitoring will be performed to verify that these areas achieve and maintain site-specific cleanup levels (Table 3-1). Again, detailed monitoring and contingency response requirements will be described in the CQAP and OMMP to be prepared as a part of remedial design.

8 FIVE-YEAR REVIEW

Because the cleanup action described in Section 4 will result in hazardous substances remaining in Port Gamble Bay at concentrations exceeding cleanup levels (e.g., beneath caps and in other areas), Ecology will review the selected cleanup action described in this CAP at least every 5 years to ensure protection of human health and the environment. Consistent with the requirements of WAC 173-340-420, the 5-year review shall include but is not limited to the following:

- A review of available monitoring data to verify the effectiveness of completed cleanup actions, including engineered caps, in limiting exposure to hazardous substances remaining in Port Gamble Bay
- A review of monitoring data for enhanced monitored natural recovery areas and monitored natural recovery areas, to confirm effective recovery of these areas
- A review of new scientific information for individual hazardous substances or mixtures present in Port Gamble Bay
- A review of new applicable state and federal laws for hazardous substances present in Port Gamble Bay
- A review of current and projected future land and resource uses in Port Gamble Bay
- A review of the availability and practicability of more permanent remedies
- A review of the availability of improved analytical techniques to evaluate compliance with cleanup levels

Ecology will publish a notice of all periodic reviews in the site register and will provide an opportunity for review and comment by the potentially liable persons and the public. If Ecology determines that substantial changes in the cleanup action are necessary to protect human health and the environment at the site, a revised CAP will be prepared and provided for public review and comment in accordance with WAC 173-340-380 and 173-340-600.

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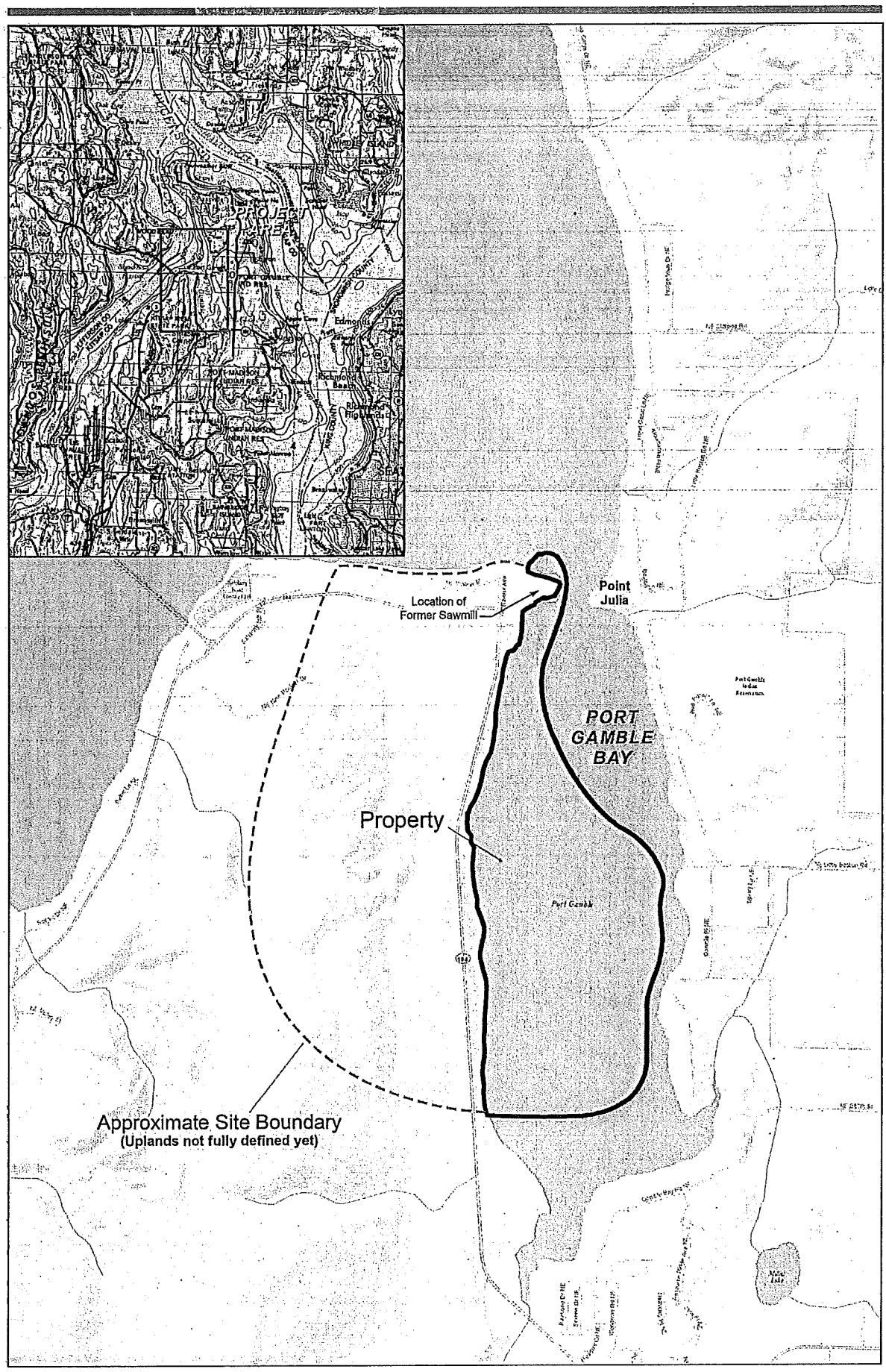
EXHIBIT B

Site and Property Diagram



Feet
0 1,000 2,000 3,000 4,000

Property

Exhibit B
Site and Property Diagram
Port Gamble Bay and Mill Site