DEPARTMENT OF ECOLOGY
State of Washington

Western Port Angeles Harbor Sediment Cleanup Unit Remedial Investigation and Feasibility Study Responsiveness Summary

Ecology's response to stakeholder and public comments

September 2020

Document and Contact Information

This document is available on the Department of Ecology's website at:
https://fortress.wa.gov/ecy/gsp/sitepage.aspx?csid=11907

For more information contact:
Toxics Cleanup Program
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775
Phone: 360-407-6261

Washington State Department of Ecology — www.ecology.wa.gov

The Department of Ecology is committed to providing people with disabilities access to information and services by meeting or exceeding the requirements of the Americans with Disabilities Act (ADA), Section 504 and 508 of the Rehabilitation Act, and Washington State Policy #188.

To request an ADA accommodation, contact Ecology by phone at 360-407-6831 or email at ecyadacoordinator@ecy.wa.gov. For Washington Relay Service or TTY call 711 or 877-833-6341. Visit https://ecology.wa.gov/accessibility for more information.

Western Port Angeles Harbor
Sediment Cleanup Unit
Remedial Investigation and Feasibility Study
Responsiveness Summary

Ecology's response to stakeholder and public comments

Toxics Cleanup Program

Washington State Department of Ecology

Olympia, Washington

This page is purposely left blank

Table of Contents

List of Figures and Tables

Page

Figures

Tables

Acknowledgements

The authors of this report thank the following people for their contribution to this study:

Lead authors and editors

- Connie Groven
- Nancy Davis

Contributors

- Marian Abbett
- Cheryl Ann Bishop
- Sheila Coughlan
- Sarah Kellington
- Rebecca Lawson

List of Abbreviations

aRPD	apparent redox potential discontinuity
CAP	cleanup action plan
cPAH	carcinogenic polycyclic aromatic hydrocarbons
CSL	cleanup screening level
DCA	disproportionate cost analysis
DOH	Washington Department of Health
EMNR	enhanced monitored natural recovery
FS	Feasibility Study
MNR	monitored natural recovery
MTCA	Model Toxics Control Act
OMMP	Operational, Monitoring, and Maintenance Plan
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PLP	potentially liable person(s)
POC	point of compliance
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
SCO	sediment cleanup objective
SMA	sediment management area
SMS	Sediment Management Standards
SWAC	surface-weighted average concentration
TPH	total petroleum hydrocarbons
WPAHG	Western Port Angeles Harbor Group

This page is purposely left blank

Introduction

The Washington Department of Ecology (Ecology) is supervising the cleanup of the Western Port Angeles Harbor Sediment Cleanup Unit (Figure 1). Harbor sediment is the material in the seabed primarily composed of silt, sand, and matter from the decomposition of plants and animals that settles to the bottom. Past industrial operations and stormwater discharges have contaminated sediments in the western harbor area.

The potentially liable persons (PLPs) are working under our oversight to characterize and clean up contaminated sediment. The PLPs include the Port and City of Port Angeles, Georgia-Pacific LLC, Nippon Paper Industries USA Co. Ltd., and Merrill & Ring.

In 2013, we signed a legal agreement (Agreed Order DE 9781) with the PLPs. At first, we did not know how contaminated the sediment was or where the contamination was located. By sampling in the Western Harbor Study Area, we learned where sediment contamination is above state cleanup levels. This area is called the Western Harbor Sediment Cleanup Unit (see Figure 1). The agreement calls for the PLPs to study the extent of contamination and assess cleanup options for sediment cleanup.

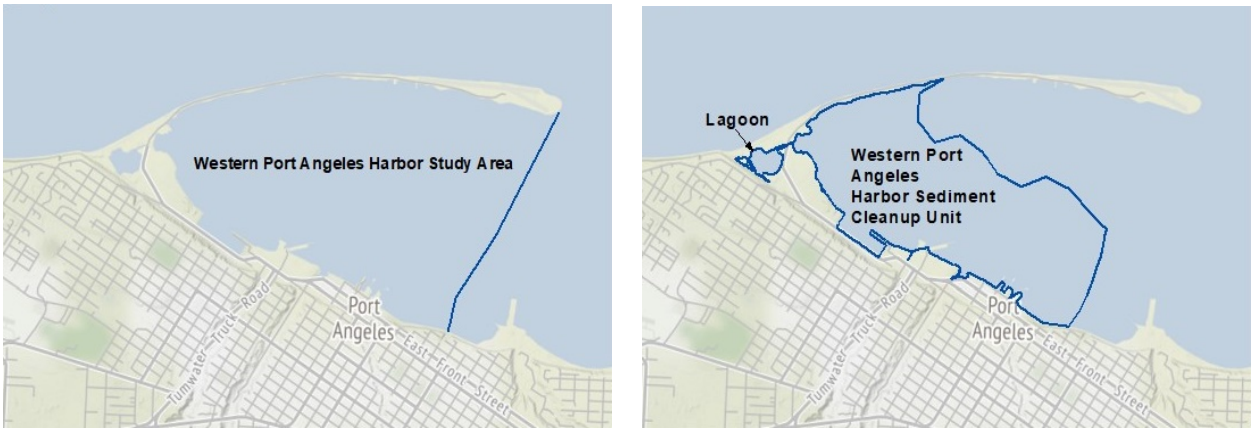


Figure 1: Western Harbor Study Area (left) and Western Harbor Sediment Cleanup Unit (right).

The summary of the work completed under Agreed Order DE 9781 is contained in the draft Remedial Investigation and Feasibility Study (RI/FS) report for the Western Port Angeles Sediment Cleanup Unit. We approved the draft report for public review.

An amendment to Agreed Order DE 9781 requires the PLPs to prepare a preliminary draft cleanup action plan. We held a public comment period and a public meeting to provide an opportunity to review and comment on the draft RI/FS and the amendment to Agreed Order DE 9781.

The comment period ran from January 16 to March 16, 2020. During the public comment period, we received comments by email, postal service, and submission to our online comment application. We received a total of 18 comments.

We appreciate the thoughtful contributions of the individuals and organizations who commented. We thoroughly considered the comments submitted. We found the advice and the input helpful and informative.

In the Responsiveness Summary, we consolidated comments that either ask the same question or express similar concerns. For each topic of concern, we sought to provide a complete and comprehensive response.

Background

Port Angeles Harbor is an important cultural area in the traditional territory of the Lower Elwha Klallam Tribe. In the last century, timber processing and other developments have led to today's busy industrial and shipping harbor.

In the past, some industries generated liquid waste and released it directly into the harbor and lagoon. Contaminated stormwater was also discharged into the harbor.

Several pulp and lumber mills burned salt-laden wood debris as a fuel source. Burning this debris formed hazardous substances, like dioxins, that rose up through smoke stacks and settled out onto marine sediments.

The Western Harbor Sediment Cleanup Unit is a large area of approximately 1,160 acres. For planning cleanup, it is divided into three sediment management areas (SMA) based on the amount of sediment contamination and the ability of cleanup equipment to access the sediment (see Figure 2).

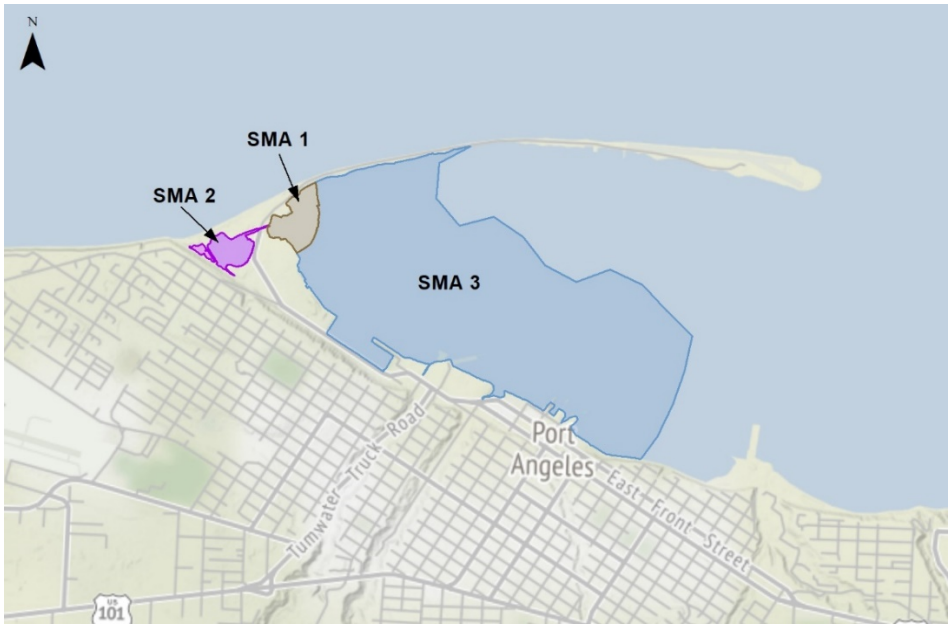


Figure 2. The three sediment management areas (SMAs) of the Western Harbor Sediment Cleanup Unit.

SMA 1 is approximately 37 acres. This area is the inner harbor and has the highest level of sediment contamination of the three areas. Cleanup equipment can access contaminated sediments more easily here than in other SMAs.

SMA 2 is approximately 25 acres. This area is the lagoon, which is located on private property. Concentrations of sediment contamination are lower than in SMA 1. Cleanup equipment may have difficulty accessing contaminated sediment because water depths are shallow making

barges or vessels typically used for cleanup difficult to operate. The area around the lagoon is an active industrial facility, which limits access to the lagoon.

SMA 3 is approximately 1,100 acres. This area is less contaminated than the other two areas. Along the shoreline, cleanup equipment will have trouble getting to sediments located close to structures built over the water. Offshore, it will be difficult to access sediment where water is deeper than 50 feet.

The Cleanup Process for the Western Port Angeles Harbor Sediment Cleanup Unit

The cleanup process for the Western Port Angeles Harbor Sediment Unit is the same process used for cleanup of other contaminated sites throughout the state. We regulate the cleanup of contaminated sites according to Washington's environmental cleanup law, the Model Toxics Control Act (MTCA, 70.105D RCW[1] and Regulation 173-340 WAC[2]). When the contaminated medium is sediment, Washington's Sediment Management Standards (SMS, 173-204 WAC[3]) and Sediment Cleanup User's Manual guide us through the sediment cleanup process.

Throughout the cleanup process, the Lower Elwha Klallam Tribe has provided us advice, input, and comments during regular meetings and discussions.

The cleanup process has several steps. One step in the cleanup process is a remedial investigation that describes what kind of contaminants are in the sediment and where the contamination is located. The draft remedial investigation (RI) summarizes the results of this process for the Western Port Angeles Harbor Sediment Cleanup Unit in the RI section of the RI/FS report.

The next step is determining cleanup objectives and evaluating the feasibility of different methods for cleaning up the contamination. The draft Feasibility Study (FS) describes and evaluates several cleanup alternatives for contaminated sediment. Results of this analysis are summarized in the FS portion of the RI/FS report.

All the cleanup alternatives considered in the RI/FS are protective of human health and the environment. The RI/FS recommends a preferred alternative. Ecology will use the information in the RI/FS and public comments to select a remedy for the cleanup action plan. The selected remedy may or may not be the same as the preferred alternative in the RI/FS.

The information gathered in the draft RI/FS was substantial, and completion of this draft is a milestone in the cleanup process. To most effectively address the public's questions and concerns, we held a comment period for the RI/FS report. At the current stage, this report is a draft and has not been finalized. Next, we will let the PLPs know what changes we require before the RI/FS is finalized. We expect to require a few minor changes to the RI/FS based on this comment period. Once the PLPs incorporate the changes, we will accept the report as finalized. The finalized RI/FS will be available at our Western Port Angeles Harbor webpage.[4]

Based on MTCA, SMS, the RI/FS report, and community concerns, we will prepare a draft cleanup action plan for the sediment cleanup unit. We will make the draft cleanup action plan and the corresponding legal agreement available for public comment. Specific elements of the

[1] https://app.leg.wa.gov/RCW/default.aspx?cite=70.105D
[2] https://app.leg.wa.gov/wac/default.aspx?cite=173-340
[3] https://app.leg.wa.gov/wac/default.aspx?cite=173-204
[4] https://fortress.wa.gov/ecy/gsp/sitepage.aspx?csid=11907

cleanup will be more fully considered during the design phase. The cleanup action plan will comply with relevant federal and state laws and permit requirements.

Documents reviewed during the public comment period

We included two documents for public review during the comment period. The two documents were the draft RI/FS report and draft amendment to Agreed Order DE 9781.

Remedial Investigation/Feasibility Study (RI/FS) Report

In accordance with Agreed Order No. DE 9781 between Ecology and the PLPs, the PLPs prepared the Western Port Angeles Harbor Sediment Cleanup Unit Remedial Investigation/Feasibility Study. The report included Part 1[5] and Part 2 (Appendices).[6] The objective of the remedial investigation is to collect and develop enough information to sufficiently characterize the sediment cleanup unit to develop cleanup action alternatives. The objective of the feasibility study is to evaluate different cleanup action alternatives to enable selection of the remedy.

The state's cleanup rule, MTCA, requires cleanup alternatives be evaluated and compared to each other based on the following requirements.

- Protect human health and the environment.
- Comply with cleanup standards.
- Comply with applicable state and federal regulations.
- Provide for compliance monitoring.
- Use permanent solutions to the maximum extent practicable.
- Provide a reasonable restoration timeframe.
- Consider public concerns.

We think the RI/FS report provides enough information for Ecology to choose an appropriate cleanup action for the sediment unit area of the harbor.

Amendment to the Agreed Order DE 9781

The second document available for public review during the comment period was an amendment to Agreed Order DE 9781.[7] The amendment requires the PLPs to prepare a preliminary draft cleanup action plan. We will use the preliminary plan to write the draft

[5] https://fortress.wa.gov/ecy/gsp/docviewer.ashx?did=89055
[6] https://fortress.wa.gov/ecy/gsp/docviewer.ashx?did=89056
[7] https://fortress.wa.gov/ecy/gsp/docviewer.ashx?did=89054

cleanup action plan. The draft cleanup action plan will be available for public comment before it is finalized.

Contamination and Alternatives for Cleanup of the Sediment Cleanup Unit

The remedial investigation found several contaminants in the Sediment Cleanup Unit of potential concern to human health and the environment. The contaminants include:

- Metals (mercury, cadmium, and zinc).
- Dioxins/furans.
- Polychlorinated biphenyls (PCBs).
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs).

Sediment contamination

Western harbor sediments near the western and southern shoreline are more heavily contaminated than areas farther offshore.

Cleanup of contaminated sediment is important. People, pets, and wildlife, including bottom-dwelling organisms, can be exposed to contaminated sediment by direct skin contact or by consuming it. They may be exposed to contaminants when they eat contaminated fish and shellfish. Hazardous chemicals may accumulate in the body if the contaminants are not removed from the body through natural processes.

The Washington State Department of Health has health advisories[8] for fish, crab, or shellfish collected from Port Angeles Harbor.

Alternatives for cleanup

All alternatives for cleanup of the sediment unit meet MTCA requirements and prevent exposure of people and other animals to contamination in sediment. Options for cleanup include excavation, capping, enhanced monitored natural recovery, and monitored natural recovery.

- Excavation removes the contaminated sediment from the intertidal or sea bottom and disposes the contaminated material offsite. Subtidal excavation is called dredging.
- Capping covers contaminated sediment with about a 2-foot layer of clean sand, gravel, and/or rock. The cap prevents exposure of aquatic life to the contamination. A cap requires an environmental covenant to protect the integrity of the cap in the future.

[8] https://www.doh.wa.gov/DataandStatisticalReports/HealthDataVisualization/MobileFishAdvisoriesMarineAreasMap

- Enhanced Monitored Natural Recovery (EMNR) places a 6-inch layer of clean sand or gravel on top of contaminated sediments to jump-start the natural recovery process that occurs through the natural deposition of cleaner material.
- Monitored Natural Recovery (MNR) requires regular checks on natural deposition to make sure new, cleaner material covers contaminated sediment over time as expected. Recovery by natural deposition occurs relatively slowly in the Western Harbor Sediment Cleanup Unit because new sediment accumulates very slowly. Contaminants in sediment would be monitored until cleanup levels are reached.

If needed, cleanup to control upland pollution sources will be handled separately by the upland property owners and Ecology.

Next Steps for the Cleanup

Here are the next steps in the cleanup process.

- Finalize the RI/FS report and sign the agreed order amendment requiring the PLPs to prepare a preliminary draft cleanup action plan.
- Prepare a cleanup action plan and an agreed order or consent decree to implement the selected remedy.
- Allow sufficient time for public review and comment.
- Finalize the cleanup action plan and order to implement the remedy.
- Complete additional sampling needed for detailed engineering design plans for the cleanup.
- Prepare the engineering design plans.
- Obtain required permits.
- Complete cleanup construction.

Realistically, the cleanup will still take a number of years due to the time it takes to design the remedy, obtain permits, and construct the remedy over a very large area while staying within "work windows." All in-water work must be coordinated with tides and the "work window." In-water work is not permitted during the early spring to early summer "fish window" that is set aside to protect fish, such as migrating juvenile salmon. The work window in Port Angeles Harbor is from about mid-July to mid-February, increasing the number of construction seasons it will take to complete this work.

Public Outreach and Involvement

We held a 90-day comment period that opened on January 16, 2020, for public comment on the draft RI/FS and amendment to Agreed Order DE 9781. We held an open house in Port Angeles in the evening on January 28, 2020, to answer questions and present information about the report. Fifty-five people attended the open house.

To inform the public about the comment period and the open house, we mailed a fact sheet[9] to local residents. We also sent an email to people and organizations on our Port Angeles email list and posted a legal ad in the Peninsula Daily News. We placed information about the comment period and the open house in our Site Register, Public Events Calendar, and Western Port Angeles Harbor webpage.

We will continue to keep the public informed during major decision points and times of investigative or interim work at the site. All electronic documents and updated information are posted regularly to our Western Port Angeles Harbor webpage.[10]

If you want to sign up for the Port Angeles email notification list, please send your name and email address to Nancy Davis, Public Involvement Coordinator, at nancy.davis@ecy.wa.gov. If you want to learn more about the public outreach process, check out the public participation plan[11] for Western Port Angeles Harbor.

[9] https://fortress.wa.gov/ecy/gsp/docviewer.ashx?did=88984
[10] https://fortress.wa.gov/ecy/gsp/sitepage.aspx?csid=11907
[11] https://fortress.wa.gov/ecy/gsp/docviewer.ashx?did=19298

Response to Public Comments by Topic

We acknowledge the time and effort it took for people to review the lengthy and detailed RI/FS report. We appreciate that people submitted their thoughtful comments during the comment period. We carefully considered each comment and tried to provide a complete and thorough response to the concerns raised in the comments.

The goal of our responses is to assist the public's understanding of the contaminant conditions in the Western Port Angeles Harbor Sediment Unit and the cleanup alternatives that were developed based on those conditions.

We did not receive any comments on the proposed amendment to Agreed Order DE 9781.

The comments we received about the RI/FS report were consolidated into major topics of concern.

Major topics raised in the comments

- Support for the RI/FS report
- Cleanup unnecessary
- Cleanup costs
- Cleanup levels
- Cumulative impacts
- Data sufficiency
- Changes in benthic conditions
- Capping
- Dredging
- In-situ treatment
- Enhanced or monitored natural recovery
- Minimum requirements for cleanup alternatives
- Recommended alternatives
- No cleanup-action alternatives
- SMA 1 recommended alternative
- SMA 2 recommended alternative
- SMA 3 alternatives
- Source control
- Tribal concerns
- Wood debris and benthic toxicity
- Document presentation

In addition to these topics of concern, one comment asked a question about why current owners or operators are considered PLPs and one comment provided information on another possible source of contamination.

Support for the RI/FS report

Many comments supported the RI/FS report as written. The reasons for supporting the report and the recommended alternative included the following comments.

- "It [RI/FS] is the result of more than ten years of study that involved extensive public outreach and includes protections for important cultural and ecological resources."

  "The RI/FS is a serious effort on the part of the PLP's to identify an economically viable path to a healthier Port Angeles harbor." Terry Gallagher

- "…we believe the science based protective remedy recommended is cost effective, can be implemented on a timely basis, and meets the Model Toxics Control Act."

  "This [preferred] remedy is comprehensive, and includes protections for ecological and cultural resources during construction to protect salmon and shellfish habitat. In addition, you have recognized that this project will be taking place in a working harbor, and your recognition of this fact will help to sustain water based operations during the cleanup period." Clallam County Board of Commissioners (Randy Johnson and Bill Peach)

- "…we write to urge the Department of Ecology to accept the preferred cleanup remedies proposed in the RI/FS for the sub-areas, called sediment management areas (SMAs). They are consistent with the state environmental cleanup regulations."

  "We ask that Ecology please accept this public review draft of the RI/FS and allow this process to move on." McKinley Paper Company (Wilfrido Rincón)

- "The preferred alternative gets this project done expeditiously, in a reasonable cost to the companies involved, and without further harm to the environment. I support moving ahead quickly with the currently suggested preferred alternative." Munroe LLC (Grant Munro)

- "The preferred alternative looks to have struck a reasonable balance between cleanup outcomes and input costs. To our knowledge, it will involve proven cleanup methods in use around the world. We support the preferred alternative." Port Angeles Business Association (James McEntire)

- "In summary, we agree with the preferred cleanup remedy supported by the thorough study initiated by Ecology in 2008, as well as compliance monitoring to ensure success over the long-term. We feel that it is time to move forward with the cleanup to assist mother nature and make Western Port Angeles Harbor safe for human health, wildlife and the environment. We feel that the time to act is now, with minimal disruption to Port operation and traffic flow, after full input of the public through the comment

period, and that Ecology should finalize this plan." Port Angeles Hardwood LLC (Marc Mendenhall)

- "I support the RI/FS that has evaluated a range of cleanup alternatives for the subareas and provides the greatest degree of benefits, including protection of human health and the environment, within in a reasonable timeline and cost."

  "The preferred cleanup plan is a result of over a decade of study. A group of five public and private entities have worked cooperatively with the Department of Ecology to agree to a science-based plan that is cost-effective, using a proven implementation approach and meets the requirements of the Model Toxics Control Act, RCW Chapter 70.105D."

  "In the best interests of the citizens of the State of Washington and most importantly the residents and visitors of Port Angeles, please move this clean-up plan forward and get the job done." Jim Haguewood

Response

Thank you for your confidence that the report was successful in meeting its twin objectives. The first objective was to characterize the contamination in the sediment unit. The second objective was to evaluate several cleanup alternatives so the cleanup action plan can be developed.

Cleanup unnecessary

Two comments supported doing no cleanup action because the contamination sources have been controlled and the Harbor should be allowed to recover naturally without human intervention.

- "Mother Nature has a phenomenal ability to heal herself. The best solution to a defiled-environment is to quit doing the destructive activity. Time heals all (mostly)."

  "Nothing will be lost and the problem which has already virtually disappeared will continue to be less of an issue." Greg Anonymous (for Karl Spees)

- "The damage was done decades ago and time is the best solution at this point." Anonymous Anonymous

Response

Our cleanups are focused on protecting the health of humans and the environment. To ensure this protection, Model Toxics Control Act (MTCA) requires that all cleanups must meet all the following requirements:

- Protect human health and the environment.
- Comply with cleanup standards.

- Comply with applicable state and federal laws.
- Provide for compliance monitoring.
- Use permanent solutions to the maximum extent practicable. A practicable remedy is one that can be designed, constructed, and implemented in a reliable and effective way, including consideration of cost. We are not required to pick the cheapest alternative, but to consider alternatives that are not disproportionately more expensive compared to other alternatives of equal benefit.
- Provide for a reasonable restoration time period.
- Consider public concerns. We've heard the public's concern through comments and we are considering these concerns in the process of following MTCA's requirements and process.

Natural processes have the ability to decrease or "attenuate" concentrations of some contaminants in sediments over time and it is tempting to just wait for this to happen. But natural processes can take many years. The length of time needed for natural recovery to work in the sediment in Western Port Angeles Harbor is estimated to take more than 70 years. This is too long to be considered a reasonable restoration time period.

In areas of the harbor with lower levels of contamination, the proposed remedy does consider natural recovery, including monitored natural attenuation and enhanced natural attenuation. In these areas, cleanup levels are expected to be reached with the help of natural processes within 10 years after cleanup construction.

Cleanup costs

Several comments expressed concerns about the cost of cleanup.

- "This is an undue burden on taxpayers…to what end?" Anonymous Anonymous
- "Minimal improvement of the real problem but at a very large expense to the current general public." Greg Anonymous (for Karl Spees)
- "We note that the contaminated sediments are the result of decades of legal industrial and manufacturing activities. The harmful effects of industrial and manufacturing byproducts were either unknown or not very well appreciated while those activities were ongoing. From a public policy perspective, it is more than appropriate that State and Federal budgets should contribute in a substantial way to the sediment cleanup. It

will not help economically for the local public and private fisc to bear the entire cost of the cleanup effort." Port Angeles Business Association (James McEntire)

- "This is a public problem and the cost of cleanup should be born by all of the taxpayers in Washington state." Stephen McKenzie

Response

Environmental cleanups can be expensive, but are often necessary to protect human health and the environment. The Model Toxics Control Act requires that PLPs are responsible for cleaning up the contaminated site. This responsibility includes the costs of the cleanup. In supervised cleanups like this one, we oversee the cleanup to ensure that investigations, public involvement, actual cleanup actions, and monitoring are done appropriately.

Each year, we provides millions of dollars in grants to local governments to help pay for the cost of site cleanup. Grants are also available for local citizen groups and neighborhoods affected by contaminated sites to facilitate public review of the cleanup.

Local governments can apply for a loan or grant to help clean up hazardous contamination sites that are supervised by Ecology under a legal agreement. These are remedial action grants. Every even-numbered year, we work with local governments to understand the 10-year cost of critical cleanup work in Washington. Their responses inform our biennial budget request to the Governor and Legislature. Our grant managers coordinate applications for grants and loans that receive funding every two years in the approved biennial budget. The City and Port of Port Angeles have received remedial action grants to assist with contaminated site cleanup around Port Angeles Harbor. More information is available on our oversight remedial action grants webpage.[12]

Cleanup levels

One comment expressed concern about how cleanup levels were being set.

- "This text [Section 8.3.2 on page 8-9 and 8-10] uses a MTCA provision as an excuse to not clean up on the basis of temporarily displacing natural resources in the harbor. The argument is that cleaning up the contamination will harm the system more than leaving the contaminants in place forever. The metals and PCBs and dioxins/furans will remain in the harbor forever if not removed or treated in place and this section seeks to make the excuse that cleaning up the harbor will cause more harm than good. The flaw in this logic is that the long term harm from leaving contaminating chemicals in place is not toxic forever." Olympic Environmental Council (Darlene Schanfald)

[12] https://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Oversight-remedial-action-grants-loans

Response

We appreciate concerns about long-term harm to the harbor through on-going exposure to harmful chemicals. However, no decisions are being made about type of cleanup, such as removal or treatment, in Section 8.3.2 of the report. This section only considers what the cleanup standards for the harbor will be. We want to be thorough in setting cleanup standards that will protect human health and the state's valuable natural fish and shellfish resources.

A cleanup level is a concentration of a contaminant, so a low cleanup level means a low concentration of the contaminant. Setting a sediment cleanup level for chemicals that bioaccumulate, such as dioxins, involves three steps.

- The lowest possible cleanup level is set at the highest of three concentrations.
    - Lowest risk-based protective concentration.[13]
    - Natural background concentration.
    - Lowest concentration that a lab can measure with confidence.
- The highest acceptable cleanup level is set at the highest of three concentrations.
    - Highest risk-based protective concentration.[14]
    - Regional background concentration.
    - Lowest concentration that a lab can measure with confidence.
- The final sediment cleanup level is set at the lowest possible cleanup level or at a higher value up to, but not more than, the highest acceptable cleanup level. We consider two factors to determine where to set the final sediment cleanup level.
    - Technical possibility of achieving the cleanup level.
    - Net adverse environmental impacts.

In Port Angeles, some of the final sediment cleanup levels are set at the highest acceptable cleanup level. It would not be technically possible to maintain the lowest possible cleanup level due to wide-spread, non-point sources of contamination, like vehicle emissions and urban stormwater runoff. These are examples of the sources of regional background concentrations. These diffuse sources continue to contribute to concentrations in the harbor. An area cleaned

[13] Risk-based protective concentrations are based on the acceptable excess cancer risk. The lowest acceptable excess cancer risk is one in a million or 10^{-6}.
[14] Risk-based protective concentrations are based on the acceptable excess cancer risk. The highest acceptable excess cancer risk is one in a hundred thousand or $10^{-5.}$

up to the lowest possible cleanup concentrations would likely soon return to regional background concentrations.

Net adverse environmental impacts are also discussed in this section of the report. Setting cleanup levels at the lowest possible cleanup level would require many more acres of remediation and take many more years to construct. Setting cleanup levels at the highest acceptable cleanup level will reduce the duration and destructive impact of the cleanup.

Cumulative impacts

Some comments expressed concerns about how cumulative impacts of wood debris and chemical contamination from multiple chemicals were being considered.

- "The document fails to account for the impact of the combined toxicity of both wood debris and the contaminating chemicals, as well as naturally occurring chemicals that exhibit innate toxicity. These two types of contamination act in concert on the benthic assemblage."

  "Failure to evaluate cumulative effects is a major flaw. The cumulative impacts of wood debris and chemical contamination should be accounted for."

  "On page 8.2, the inherent flaw in the analytical system is apparent in how chemicals are dropped from further consideration by assessing individual chemicals according to a single benchmark number… This problem is most serious when the chemical act on a common biological endpoint, such as the nervous system, a sensitive tissue for most, if not all metals. An excellent example is mercury, lead and cadmium, all of which target the developing central nervous system. This inherent flaw is present in the analysis of these data and unfortunately is imbedded in agency procedures and regulation." Olympic Environmental Council (Darlene Schanfald)

Response

We agree it is important to evaluate the cumulative effects of chemical contamination and non-chemical stressors present in the sediment, such as wood waste. We evaluated cumulative effects using several methods.

- Adjusting risk-based cleanup levels downward to account for cumulative effects.
- Testing exposure of benthic life to Port Angeles Harbor sediment.
- Evaluating habitat conditions in Port Angeles Harbor sediment.

We calculate exposure to humans, fish, birds, mammals that eat fish and shellfish, and the animals living in the sediment and choose the lowest as the risk-based cleanup level. We address cumulative effects by lowering the risk-based cleanup levels for individual

contaminants so the total risk for the site is protective. We also adjust the cleanup level downward for specific toxic endpoints such as toxicity to the liver.

We must also consider background levels and the lowest concentrations that laboratories can measure with confidence when we set final cleanup levels. Risk-based cleanup levels are often lower than background levels or the concentrations that laboratories can confidently measure. This is the case with the cleanup levels set in Port Angeles Harbor, where final cleanup levels are based on regional background levels. We don't adjust cleanup levels downwards when risk-based concentrations are lower than the regional background concentrations or the lowest levels that a laboratory can measure. In Port Angeles Harbor, the regional background concentration is the lowest concentration we expect can be maintained in the long term.

Another way we address cumulative effects is by exposing sensitive organisms to actual sediment samples. This method is bioassay testing,[15] which shows whether there are cumulative effects from contaminants and stressors on benthic organisms. Harbor locations where bioassay tests fail must be addressed by cleanup. These locations will be cleaned up even if the concentration of each individual contaminant does not exceed its cleanup level.

We also use other tools, like sediment profile imaging, to get a cross-section image of the conditions that exist in harbor sediments. These images help us understand the health of the communities of organisms living in the sediment.

Data sufficiency

Several comments were concerned about where and how long ago the data used in the report were collected.

- "Data are primarily from 2008 and 2013, 12 and 7 years ago, respectively. No current data from the past two years is used in this analysis."

  "The most recent data are 5 years old and must be updated before a decision is finalized." Olympic Environmental Council (Darlene Schanfald)

- "The Tribe supports additional characterization during the pre-remedial design phase to include characterization of intertidal areas within the lagoon (SMA-2) and within proposed buffer areas surrounding and beneath overwater structures and in other nearshore areas (SMA-1 and SMA-3). The potential for disturbance in these areas to re-suspend sediments and re-contaminate adjacent remediated areas should be evaluated and addressed. Potential contamination in these areas must be considered and

[15] The bioassay exposes a benthic animal to sediment from the harbor in a laboratory setting where their survival, development, and growth can be observed over time. A bioassay failure indicates abnormal animal survival, development, or growth.

addressed when determining compliance with cleanup levels based on surface-weighted averaging."

"…there are a number of historical industrial outfalls located in the inner harbor and the lagoon. It appears that these shoreline locations were not sampled during the remedial investigation. We recommend collecting sediment grab and core samples from these intertidal areas during the pre-remedial sampling design."

"…there appears to be a sampling gap along the northwestern shoreline from the Tesoro leased pier to the east. This area appears to have greater composition of fines and is located near significant historical industrial activities." Lower Elwha Klallam Tribe (Matt Beirne)

Response

In Port Angeles Harbor, very little new sediment is deposited each year. This means surface conditions change slowly and sediment results are meaningful for longer than they would be in a location with higher deposition rates. Based on the low deposition rates, the harbor data from 2008 and 2013 are considered reasonably representative of current conditions.

While the data in the RI/FS are sufficient for characterization and selection of a remedial alternative, we plan to gather additional data during remedial design to refine the remedy. During the RI/FS, some samples were taken near historic industrial and municipal outfalls. Additional samples will be collected in the intertidal areas of SMA 1 and SMA 2 and beneath and around over-water structures to confirm and refine the concentrations estimated in the RI/FS report. Additional intertidal and subtidal samples will also be collected east of the pier currently leased by Tesoro.

It can be difficult or impossible to clean up under and next to over-water structures, so the RI/FS assumed that those sediments would remain as they are now. Larger remediation areas were included in the alternatives to compensate for this. The 50-foot buffer area around structures will be evaluated on a structure-by-structure basis during design. The size of the buffers will be reduced where possible. The concentrations of contaminants in areas under and around structures that are not remediated will be taken into account when determining if cleanup levels are met.

Changes in benthic conditions

One comment questioned whether the data in Table 7.7 of the RI/FS report showed benthic conditions improving over the 15-year period between sediment profile imaging surveys.

- "This table [Table 7.7] gives biological successional stage (the progression from simple to more complex and abundant biological communities), and aRPD (redox potential discontinuity) do not give confidence that natural recovery is working effectively and

quickly. The depths for the ARPD are not close to the standard 10 cm considered the standard depth for oxidized habitat that supports a healthy benthic community. The 15 years, from 1998 to 2013, shown in the table that elapsed between the two surveys should have been enough time to see greater recovery. And those data are now an additional 7 years out of date/not current. Given the extent and nature of the wood debris, large sizes of the wood debris, there is no evidence that recovery is proceeding at a sufficient pace." Olympic Environmental Council (Darlene Schanfald)

Response

In Puget Sound, the majority of marine benthic macroinvertebrates are generally found within the uppermost 10 centimeters (cm, about 4 inches) of sediment. This depth has been established as the biologically active zone depth that is protective of most benthic organisms. Ten cm is not, however, the typical depth of the apparent redox potential discontinuity (aRPD).

The aRPD is the line separating the lighter-colored surface sediment from the darker sediment below. The light colored sediment shows the surface oxygenated layer. This layer generally corresponds to the depth to which the sediment is highly mixed by the activity of benthic organisms. Deeper aRPDs suggest the presence of deeper-dwelling benthic animals, which usually indicates healthier communities.

The aRPD depths in Table 7.7 are typical of sediments in Puget Sound. The increasing aRPD depths in 31 of the 43 sediment profile imaging stations surveyed in both 1998 and 2013 show improved benthic habitat quality at many locations in the Western Port Angeles Harbor Study Area.

Capping

Several comments showed concerns about the use of capping as a remedial technology in the Harbor. Concerns included upwelling of sulfides below the cap from decay of wood waste and limitations on future creosote piling removal.

- "These [SMA1 and SMA2] are the areas of some of the heaviest wood waste accumulation as well as the highest porewater sulfides, suggesting that in these areas anaerobic decay of wood waste is still ongoing. If a cap is constructed, monitoring for the upwelling of sulfides from anaerobic decay of wood waste should be conducted in those areas."

  "Limitations on sediment disturbing work in the cap area will also inhibit creosote piling removal efforts; creosote pilings are specifically cited as a source control issue. DNR is concerned about recontamination from these pilings and the appropriateness of a cap that would restrict that source control work. Capping could limit future creosote piling removals." Washington State Department of Natural Resources (Erika Shaffer)

Response

To ensure a capping cleanup alternative would be appropriate, the RI/FS report includes a preliminary cap design evaluation in Appendix K. Usually this level of detail would be completed during the engineering design phase.

Porewater sampling and analyses performed as part of the RI/FS indicated a low potential for migration of hydrogen sulfide up through an engineered cap. The results of the 2017 Ediz Hook wood debris capping pilot project performed separately by the PLPs and Lower Elwha Klallam Tribe supports this conclusion. During remedial design, additional location-specific data will be collected to ensure the cap would continue to be effective. Post-construction monitoring of sulfides will be used to verify the cap's effectiveness.

Cap designs and monitoring plans will be developed to allow removal of creosote pilings within capped areas in the future.

Dredging

Some comments were concerned about the use of dredging as a remedial technology in the Harbor and requested using modern dredging techniques and equipment to reduce releases from the dredged material to minimum amounts.

- "The Executive Summary states that the "in-water" dredging will cause release of sediment bound chemicals, but modern techniques and equipment will reduce such releases to a minimal amount, far less than even 10 years ago."

  "The most up to date methods are not included (removal methods used in the US) and the FS is incomplete without these methods."

  "Page 12-4 for example discounts the option for environmental bucket dredges or the sort that have been used in the Lower Duwamish River and in Newark Bay. In the former case, contaminated sediments from an Early Action were removed by an environmental bucket dredge designed and operated for just such a purpose as contaminated sediment removal. …in at least Newark Bay, if not several other cases, the use of modern technologies and approaches was able to reduce dredge residuals to a mere fraction of other operations and historical residuals." Olympic Environmental Council (Darlene Schanfald)

Response

We are committed to using methods that are proven, reliable, and effective for site-specific conditions to achieve our environmental goals. We select equipment, techniques, and best management practices to minimize environmental impacts.

The technology screening in Section 12 of the RI/FS report retained subtidal dredging as a potential remedial technique for this project. Mechanical dredging, using mechanical equipment tailored to site-specific conditions, was selected for evaluation in the Feasibility Study. Hydraulic dredging was not selected because buried logs, deposits of large wood debris, and deep water depths in part of Western Port Angeles Harbor make hydraulic dredging unworkable.

Even with recent improvements in dredging techniques and equipment, some contaminated sediment will spill or be stirred-up when the dredge lifts the sediment from the sea bottom. This can release contaminants to the water column. The contaminated sediment in the water will settle again on the sea bottom leaving some contaminated sediment behind. References in Section 12.1.2 list case studies of dredging in the Duwamish River, Newark Bay, and other places. The studies show that the amount of residual contaminated sediment left behind is mostly controlled by site conditions, such as sediment density, and not by dredge techniques or equipment.

Contaminated sediment that remains after dredging is expected to be greater in areas with large amounts of debris on the sea bottom (such as the woody debris found in parts of the Western Port Angeles Harbor). The debris can interfere with proper closure of the dredge bucket, which leads to additional releases of suspended sediment into the water.

Dredging included in the cleanup action plan will use equipment, techniques, and best management practices to minimize and control environmental impacts. The RI/FS evaluation assumes that shortly following completion of dredging, either a 6-inch layer of clean sand or an engineered cap will be placed on the sea bottom to prevent movement of any remaining residual contaminated sediment. The layer or cap also provides a cleaner sediment surface following construction.

In the Feasibility Study, only a general description of a closed clamshell dredging bucket was included. No specific types of mechanical buckets were eliminated. The exact mechanic equipment and type of dredging bucket will be selected during the engineering design phase. The report does indicate that an open clam shell dredging bucket will likely be needed to remove logs and large woody debris from the sea bottom.

In-situ treatment

Several comments wanted further evaluation of in-situ treatment technologies. In-situ means “in its original place” and refers to treatment that can be completed without removing the sediment. The treatment usually involves applying or mixing an amendment into the sediment to immobilize or destroy contaminants.

- “A method or methods that actually convert the toxins in situ without killing or removing the natural living harbor, have ripened for present use and would be much

more cost effective and beneficial to the health of the site as a whole. I submit a request that those methods be used instead." Port Townsend AirWatchers (Gretchen Brewer)

- "By combining these technologies as appropriate we are able to treat hard to treat as well as mixed contamination simultaneously with visible improvements to the site, often with minimal disturbance to the ground through our specialized application methods."… "The addition of these technologies within existing treatment options provided for in the Port Angeles Harbor Cleanup will ensure that when completed the contamination is not simply covered up, rather the site is clean and restored to a healthy safe condition." The Remediators Inc. (Howard Sprouse)

Response

The technology screening process looked closely at in-situ treatments, but the method was eliminated from final consideration. In-situ treatments offered limited benefits compared to other cost-effective, reliable technologies, such as capping or enhanced monitored natural recovery.

Application of activated carbon is one of the most widely used methods of in-situ treatment. During the Remedial Investigation, representative samples from SMA 1 and SMA 2 were treated with activated carbon to see if this treatment method would be effective. The activated carbon was fairly successful in attracting contaminants and reducing bioaccumulation and human health risks in SMA 1, but not in SMA 2. Contaminants attach tightly to the activated carbon. This will reduce risk of exposure, but it doesn't decrease the contaminant concentrations in the sediment. Our cleanup levels are based on contaminant concentrations.

In Western Port Angeles Harbor, the contamination is a mixture that does not lend itself well to in-situ treatment. A method that effectively treats one type of contaminant will not satisfactorily treat another type. We must use methods to achieve cleanup goals that are proven, reliable, and effective in site-specific conditions. In-situ methods may be considered again during the design of the cap or the enhanced monitored natural recovery remedy if it results in cost savings by reducing the thickness needed.

Enhanced or monitored natural recovery

Several comments objected to the use of enhanced monitored natural recovery or monitored natural recovery as remedial technologies in the Harbor.

- "The metals will not breakdown ever; natural recovery is useless for metals, PCBs and especially dioxins that breakdown so slowly and under such conditions as to be not treatable, rendering natural recovery also useless for these compounds."

  "… Monitored Natural Recovery does explain that several different processes are involved in and considered MNR: physical cover, chemical breakdown, and biological

digestion. The most toxic chemical contamination problems in Port Angeles Harbor will not be addressed by MNR at all, especially because the natural sedimentation rate is low in the harbor, as explained in this section. MNR for metals and chlorinated organic chemicals that do not breakdown is ineffective." Olympic Environmental Council (Darlene Schanfald)

Response

Monitored natural recovery includes physical, chemical, and biological processes that contribute to surface sediment recovery over time. In Western Port Angeles Harbor, the sedimentation rate averages just 0.17 cm (less than 1/10th of an inch) per year. This means it would take about 60 years for approximately 10 cm (about 4 inches) of clean sediment to be deposited on the sea bottom.

Enhanced monitored natural recovery relies on the same processes, but the physical process is sped up by adding a layer of clean sand and/or gravel first. Adding 6 inches (about 15 cm) of clean sand is the same as adding about 90 years of natural sediment deposition. The addition of the layer of clean sand gives a 90-year jump-start on the natural recovery process. Monitoring is an integral part of both of these methods to ensure recovery is progressing.

For metals and persistent organic chemicals, such as dioxins/furans, the natural recovery process is mostly driven by the physical processes of natural deposition and mixing of the cleaner sediment on top with the contamination below. This reduces surface sediment concentrations over time. Unlike a cap, the enhanced monitored natural recovery layer is not designed to fully isolate underlying sediment contaminants, but allows for mixing of the sediment to occur.

Minimum requirements for cleanup alternatives

One comment asked that alternatives that did not comply with the minimum requirements of MTCA and SMS be removed from the report.

- "Alternatives that do not comply with the requirements of the Model Toxics Control Act (MTCA) or the Sediment Management Standards (SMS) should not be included in the RI/FS. Retaining such alternatives is misleading and gives the appearance that the alternative preferred by the proponent provides greater protection than an alternative that doesn't even meet MTCA and SMS standards." Lower Elwha Klallam Tribe (Matt Beirne)

Response

A screening of cleanup alternatives, as done in Section 13 of the RI/FS report, is part of the cleanup process outlined by MTCA (WAC 173-340-350(8)(b)). During the screening, alternatives are evaluated to see if they meet the minimum requirements of MTCA (WAC 173-340-

350(8)(c)(i)(G)). Alternatives that do not meet the minimum requirements are not carried forward to the next step, the disproportionate cost analysis. Several alternatives initially proposed in the RI/FS, including Alternatives 1-G, 1-H, 2-F and 2-G did not meet the minimum requirements of MTCA and were eliminated from consideration prior to the disproportionate cost analysis.

Recommended alternatives

A couple comments disagreed with the recommended cleanup alternatives, supporting options that maximized contaminant removal instead.

- "These [preferred] options do not present the most effective long term options. The better options maximize removal of the contaminants from the intertidal zone in SMA 1 intertidal areas, with subtidal removal. In SMA 2, the better option is intertidal removal with some subtidal removal and EMNR. And in SMA 3, the option should include removal and EMNR, with limited MNR."

  "The alternatives with maximum removal will provide much better long term, permanent protection and will be more cost effective for the Port Angeles community." Olympic Environmental Council (Darlene Schanfald)

Response

We appreciate the community's concern about leaving sediment contamination in-place. We are committed to using permanent solutions to the maximum extent practicable.

MTCA requires cleanup alternatives to:

- Protect human health and the environment.
- Comply with cleanup standards.
- Comply with applicable state and federal laws.
- Provide for compliance monitoring.
- Use permanent solutions to the maximum extent practicable.
- Provide for a reasonable restoration time period.
- Consider public concerns.

All the proposed cleanup remedies in the Feasibility Study meet the above requirements except only one provides the most permanent solution to the maximum extent practicable. We use disproportionate cost analysis to evaluate which alternative satisfies this requirement. A practicable remedy is one that can be designed, constructed, and implemented in a reliable and effective way, including consideration of cost. We are not required to pick the cheapest

alternative, but to consider alternatives that are not disproportionately more expensive compared to other alternatives of equal benefit. Based on the disproportionate cost analysis in the Feasibility Study, the recommended alternatives provide the most practicable permanent solution. More permanent alternatives are disproportionately more costly.

Once the cleanup is completed, the site will be monitored and the responsible parties must ensure the remedy remains protective of human health and the environment, including maintaining any engineered caps. We will inspect and review the situation at the site about every five years to ensure conditions continue to protect human health and the environment. A report of the periodic review will be available for public review and comment.

No cleanup-action alternatives

One comment expressed concern that a no-action alternative was not included in the screening procedure.

- "One of the options must be the one of doing nothing or also called the "No Action Alternative." This option must describe how risks and conditions can be expected to progress over the coming years if no active cleanup is undertaken." Olympic Environmental Council (Darlene Schanfald)

Response

Under our state's cleanup rule, MTCA, the feasibility study is not required to include a no-action alternative. In most cases, a no-action alternative would not meet the minimum requirements for a MTCA cleanup, such as meeting cleanup levels within a reasonable restoration timeframe.

SMA 1 recommended alternative

There was concern about the engineered cap in the recommended alternative for SMA 1. The comment noted that institutional controls restricting future activities to protect the cap required Washington Department of Natural Resources (DNR) authorization. The methods for managing and maintaining the cap were not clear. There were concerns about whether navigational depths could be maintained over time and if a cap meets the public's desire to reduce risks.

- "Engineered caps are a major component of the selected remedy for SMA 1, primarily on State-Owned Aquatic Lands. Because engineered caps typically require institutional controls that may encumber future uses of SOAL [State-Owned Aquatic Lands], including restrictions on anchoring, they require authorization from DNR. This authorization will be necessary for not only the cap itself but for ongoing maintenance and monitoring for the lifetime of the cap. …The proposed method of management of the risk of damage to the cap from scour, anchoring, and other activities, including eventual replacement of

improvements at the end of life, is not clear. …will it be possible to maintain navigational depths over time if potential dredging is restricted by the presence of a cap?"

"It is not clear that the amount of removal of contaminated sediments would truly meet the public desire to reduce risks from ongoing contamination by removing contamination from the harbor, particularly with respect to the potential for damage to the cap during normal activity in the harbor." Washington Department of Natural Resources (Erika Shaffer)

Response

We acknowledge and recognize the need to consult with DNR and obtain use authorization, if necessary, prior to construction on state-owned aquatic lands. The report assumed construction of robust engineered caps in SMA-1. The engineered caps would remain intact and accommodate future activities in the harbor such as vessels maneuvering and anchoring. During remedial design, cap specifications will be refined to ensure its long-term integrity and protectiveness. Institutional controls described in the Operations, Maintenance, and Monitoring Plan will not unreasonably prevent future uses of state-owned aquatic lands.

The natural sediment deposition rate in the harbor is 0.17 cm per year, or 17 cm (less than 7 inches) in 100 years. This deposition rate is not expected to affect navigational depths. If maintenance dredging is required in the future, this work will be conducted consistent with any other maintenance dredging projects.

Our cleanup remedy decisions under MTCA/SMS are based on identifying the alternative(s) that is permanent to the maximum extent practicable, using the disproportionate cost analysis. After listening to public comment, we believe the majority of the public supports the outcome from evaluation of the proposed alternatives. The effectiveness of the remedy will be verified through long-term monitoring.

SMA 2 recommended alternative

There were concerns expressed with the recommended alternative for SMA 2 about reduction in the amount or quality of habitat. Capping alone would result in loss of part of the aquatic habitat unless additional aquatic habitat is created. There was a preference for excavation or partial excavation and capping to avoid this.

- "The selected alternative should not rely on filling of intertidal areas that would result in the loss of the amount or quality of intertidal habitat."

  "…a full dredging or partial dredging and capping option is necessary rather than capping only or EMNR options. While a revised alternative (Alternative 2-D) provides a new option that focuses on intertidal and shallow subtidal excavation and capping

actions in the lagoon to minimize changes to ecological conditions in this area, it is not included in the preferred alternative. The Tribe continues to strongly prefer excavation or partial excavation and capping in the lagoon, as opposed to capping and EMNR only." Lower Elwha Klallam Tribe (Matt Beirne)

Response

We understand the Lower Elwha Klallam Tribe's desire to preserve the amount and quality of habitat in the lagoon. Performing a cleanup in the lagoon will temporarily disrupt the habitat, but the cleanup will ultimately improve the conditions.

The alternative recommended in the RI/FS should result in no net loss of aquatic habitat area or function. Removing the causeway fill in the lagoon under Alternative 2-E would not only result in no net loss of aquatic area within the lagoon, it would also improve habitat conditions of the area currently behind the causeway. This action will increase circulation and connectivity.

During design and permitting of the remedy, our selected alternative will be refined to include additional mitigation, as necessary, to meet regulatory requirements including no net loss of aquatic habitat area or function.

SMA 3 alternatives

Another comment expressed concern about the alternatives considered for SMA 3.

- "One notable aspect of this section [Section 13] is that the FS includes and proposes no action for the largest area, SMA 3. The explanation for no active remediation for the majority of the harbor is that active remediation is too difficult and too expensive." Olympic Environmental Council (Darlene Schanfald)

Response

The area of SMA 3 is large and the concentrations of contaminant concentrations are low. Dredging or capping over this large area is considered technically impracticable and not feasible because the cost of the remedy would far out-weigh the benefits gained.

The proposed alternatives do include various amounts of enhanced monitored natural recovery and monitored natural recovery. These are not "no-action" alternatives. The recommended alternative 3-B includes 132,000 cubic yards of clean material placed over 164 acres. It is estimated that this alternative will take 3 years to construct at a cost of $15,400,000. Alternative 3-B is predicted to meet all the MTCA requirements without being disproportionately costly. Though not included in the Feasibility Study, an estimate to dredge or cap this large area would have clearly been disproportionately costly compared to the benefits.

Source control

A number of comments expressed concerns related to controlling sources of contamination. There were concerns that the current agreed order does not require the elimination of sources. Comments requested information on how we will coordinate source control efforts and cleanup.

Some comments also expressed concerns that contaminated sediment in no-action areas could mobilize and recontaminate cleaned-up areas or continue to be areas of potential contaminant exposure.

- "The document portrays a general assumption that on-going sources from the on-land, human made features on the harbor shore cannot and will not be controlled. These sources present contamination problems that are not being addressed at present, according to the RI report on nature and extent of contamination."

  "In Port Angeles, the remedy does not consider what can and should be implemented to address ongoing sources of contamination."

  "The on-going and land based sources, both soil-based and water-based, must be controlled by requirement and with certainty. Olympic Environmental Council (Darlene Schanfald)

- "Since source control will be administered through other Ecology programs, it would be helpful to have an overview of how coordination between source control and cleanup will be conducted for this site."

  "No action areas defined by a 50 foot offset from overwater structures also coincide with much of the areas of potential scour in SMA 1. Contaminated sediments in these areas could be mobilized and contribute to recontamination of the capped area. While DNR understands the practical infeasibility of dredging and engineered capping in these areas, some alternatives, such as ENR with or without amendment by activated carbon, should have been considered."

  "The channel between the harbor and lagoon, terminal berthing areas, and sections of erodible shoreline are all cited as potential sources of contamination, but are all considered to be part of no action areas. These sources do not appear to be sufficiently addressed in a source control evaluation. Additionally, much of these areas are considered to be areas of direct contact exposure and/or sessile seafood exposure, presenting a risk to the public who may access the areas for recreation or fishing activities, either at present or in the future." Washington Department of Natural Resources (Erika Shaffer)

Response

Much of the current surface sediment contamination is largely attributable to legacy sources that have been controlled for decades. This information is shown in the conceptual site model presented in Section 9 of the RI/FS report. Recent source control efforts have been completed. These include reductions in combined sewer overflows and shoreline site cleanups, like K Ply.

The current agreed order only requires completion of the RI/FS report for the sediment in Western Port Angeles Harbor. Most of our cleanups and agreed orders address the entire cleanup site that is defined as everywhere that contamination is located. This can include multiple media, such as soil, groundwater, and sediment. Because of the complexities of Port Angeles Harbor and the number of PLPs, we only focused the current agreed order on the harbor sediment.

We agreed to address upland sources of contamination separately with each PLP. We will continue addressing contaminated soil and groundwater in shoreline sites to eliminate remaining sources of contamination. Each of these sites will have separate agreed orders for investigation and cleanup. Cleanup is already underway at several upland sites, including the Marine Trades Area and Unocal Bulk Fuel sites.

As part of this RI/FS report, the Western Port Angeles Harbor PLPs were required to identify potential ongoing sources of contamination. Appendix E includes the results of this effort. We will use this information to support our on-going cleanup efforts and address any new sources identified. We will coordinate with our other programs to address source control efforts, such as actions to address diffuse non-point sources to stormwater by the Water Quality Program.

We are planning to collect additional data during the remedial design phase to refine the remedy, including no-action areas. No-action areas that could potentially be sources include the buffer areas under structures and intertidal areas where recreational, fishing and shellfishing activities may take place now or in the future.

In developing sediment cleanup alternatives, the RI/FS assumed that surface sediments beneath and surrounding over-water structures will remain at existing conditions. The 50-foot buffer is an estimate of the area that might be used. The actual size of the buffer area around individual structures will be evaluated during design. The size of the buffer areas will be reduced as much as practicable.

The area of contaminated sediment located under and around structures has relatively little influence on the average concentration across the large sediment cleanup unit. This is because the sediment surface area that is located under piers is small compared the large sediment surface area of SMA 3. Even so, the remedial design may place enhanced monitored natural recovery material under certain over-water structures when fine-tuning the final remedy. This decision will be informed by geotechnical and structural analyses and the level of protectiveness needed.

The design plan includes additional sampling of intertidal areas where the public may come into direct contact with sediment during recreation, fishing, or shellfishing. The additional sampling is needed to provide the necessary details to fine-tune the remedy design for these areas.

The narrow channel connecting SMA-1 and SMA-2 is a highly engineered, high-velocity channel that contains no fine sediments. Therefore, the channel is not a contaminant source area of concern to adjacent sediment areas of SMA 1 or SMA 2.

Tribal concerns

Other comments expressed concerns about the impacts of the proposed transloading facility on the adjacent Tse-whit-Zen village site and impacts to Tribal treaty rights.

- "The Tribe anticipates that extended activities at the proposed transloading facility may have significant impacts on Tribal uses and resources at the adjacent Tse-Whit-Zen village site. WPAHG should be on notice to consult with the Lower Elwha Tribe and develop culturally appropriate mitigation for these potential impacts. In addition to options for shielding to minimize noise and dust impacts, compensatory mitigation may also include additional ecological restoration actions at the lagoon." Lower Elwha Klallam Tribe (Matt Beirne)
- "The RI/FS notes that institutional controls would be detailed as appropriate in an OMMP to be developed and refined during remedial design "ensuring that such controls minimize the potential to impact the exercise of Tribal treaty rights." This sentence should be modified to add the phrase "including tribal access to treaty resources." In addition, it should be expressly noted that institutional controls that have the potential to impact the exercise of Tribal treaty rights should be developed in consultation with Lower Elwha and the S'Klallam Tribes." Lower Elwha Klallam Tribe (Matt Beirne)

Response

We are dedicated to continuing regular consultation with the Lower Elwha and S'Klallam Tribes and keeping them informed about the cleanup process. A discussion of mitigation or compensation for impacts on Tribal uses and resources at Tse-Whit-Zen will be considered during permitting and the remedial design stage when the scope of the transload impacts are better understood.

The RI/FS report clearly states that the Operational, Monitoring, and Maintenance Plan (OMMP) will be developed and refined during remedial design to minimize the potential to impact the exercise of Tribal treaty rights. Any institutional controls with a potential to impact the exercise of Tribal treaty rights will be developed in consultation with the Tribes. We will add language to the RI/FS report to address these concerns.

Wood debris and benthic toxicity

Some comments expressed concern about wood debris on the sea bottom and benthic toxicity. There were concerns that the RI/FS report minimized wood debris impacts, and that the evidence doesn't fully support a conclusion that wood debris does not pose a toxicity concern. Some comments thought benthic toxicity was down-played in the RI/FS report and that there were other possible explanations for benthic toxicity.

- "The introductory points on page 7-0, key findings, suggest that the benthic toxicity is small and of no real concern, while the previous section makes a different conclusion, based on chemical concentrations and wood debris distribution and abundance. Wood debris harms benthic marine habitats and organisms."

  "This section [Section 7.2.4] seeks to use the survey information to make the case that benthic habitat is not impacted by chemical contamination or wood debris. The logic here is faulty and the information and data do not fully support the explanation given as the prime explanation and certainly not as the sole explanation. The successional stage of the benthic assemblage may equally as likely be limited and is not higher due to a depressive impact from chemicals and wood combined."

  "Section 9.0 Page 9-0 lists bulleted items that are information items from the Remedial Investigation. The last item on the list, the "determination that wood debris, although widespread, does not pose a toxicity concern within the SCU (sediment cleanup unit)" is not fully supported by the evidence and, indeed, evidence in the Remedial Investigation contradicts this statement …"

  "…[Section 9.2] describes a benthic community that is little impacted by wood debris and the text makes little to no comment about the effects of the combined exposures of wood debris and toxic chemicals. Nor does the section admit or recognize the alternative explanation of the data that the wood debris continues to impair the benthic community and limit growth and recruitment. The alternative interpretation must be given equal credence and credibility, based on the existing evidence." Olympic Environmental Council (Darlene Schanfald)

Response

It's possible that wood debris contributes to toxicity. We will modify the definitive statements in the RI/FS report to reflect the possibility of wood debris contributing to toxicity.

Section 6 of the RI/FS report summarizes the results of the human health and ecological risk assessments we published in 2012. This information is based on 2008 data collected in the harbor. We based its conclusions on the surface sediment chemical concentrations, bioassay

failures,[16] and wood debris information available at that time. We concluded the benthic invertebrate community may be impaired and that chemical contamination and wood debris may contribute to impairment of the benthic community. Wood debris is present in roughly 20 to 25 percent of the sea bottom in Western Port Angeles Harbor and assessing risks posed by wood debris was a key focus of the RI/FS report.

Section 7 describes the nature and extent of contamination and wood waste with the addition of all the new data gathered as part of the RI/FS. Additional bioassay testing in 2013 during the RI/FS investigation and retesting of stations with larval bioassay [17]failures in 2008 using updated bioassay procedures resulted in only 11 of 61 stations exceeding SMS sediment toxicity criteria. The RI/FS conclusions in Section 7 are based on this new information and are different from the conclusions summarized in Section 6.

There is some conflicting information about whether wood debris is causing abnormalities in animals living in the sediment. The areas where bioassays failed and showed the benthic animals were impacted are mostly located where chemical concentrations are above cleanup levels. Some of these areas also have wood debris. Some bioassay testing in areas that have wood debris but don't have chemical exceedance passed, suggesting that wood debris alone isn't impacting the animals living on the sea bottom. But, there are also several locations with bioassay failures where chemical concentrations are not exceeded and wood debris is present. These failures could be due to the combined effects of multiple chemicals present at concentrations that do not exceed the criteria and/or other factors, such as wood chips, wood pulp, or macroalgae.

Another way we check to see if wood debris adversely affects life in the sediment is to measure the amount of organic material in the sediment and see if the amount corresponds to the bioassay test results. Total volatile solids and total organic carbon are two characteristics measured in the laboratory that indicate the amount of organic material, such as wood debris, in the sediment. This study found bioassays tended to fail when the amount of organic material present in sediment was higher. A number of sources of organic enrichment may have influenced the bioassay tests, including wood chips, historically released wood pulp, and decay of macroalgae (seaweed).

For these reasons, it's possible that wood debris contributes to toxicity. We will modify the report to reflect the possibility that wood debris contributes to toxicity. There are a few locations where bioassay tests failed where cleanup actions are not planned. These locations

[16] The bioassay exposes a benthic animal to sediment from the harbor in a laboratory setting where their survival, development, and growth can be observed over time. A bioassay failure indicates abnormal animal survival, development, or growth.

[17] A bioassay test using young bivalves after they have hatched and before they change into the adult form of a bivalve.

will be sampled again during design. If these tests fail again, the areas will receive active cleanup.

Document presentation

One comment expressed concern about how the document was presented and organized.

- "The document as a whole relies on large amounts of information that is presented primarily in appendices; adding additional summary information in the main text to reduce the amount of cross referencing required would make the document more accessible." Washington Department of Natural Resources (Erika Shaffer)

Response

For sites we supervise, we always make the RI/FS report available for public review and comment. The RI/FS is packed with technical information. To enable the public to review it and comment on it, we try to organize the material to make it as easy as possible for the non-specialist to read. That is why we separated the most detailed technical information into appendices for technical specialists to evaluate. In trying to achieve a balance between accessibility of information for the public and for the technical specialist, we realize this may not be the ideal way to organize the report for people of all levels of technical knowledge.

Answers to Questions Submitted During the Comment Period

Responsibility for cleanup

One commenter asked why the city and present owners are responsible for cleanup.

- "…why the burden of the cleanup is falling on the city and the present owners of contaminated property? Isn't the contamination something that started decades before anyone knew to protect the environment? Unless the current owners have continued to intentionally pollute over the past 20 or so years it seems unfair for them to carry the burden of remediation." Stephen McKenzie

Response

It is understandable to question why a current owner of a contaminated property, who may not have been responsible for causing contamination, would be held responsible for cleaning up the contamination. However, our state cleanup regulations include current owners in the list of responsible or liable persons. MTCA lists those liable for the release of hazardous substances at a contaminated site (RCW 70.105D.040(1)).[18] Liable persons may include:

- The current owner or operator of the facility.
- Persons who owned or operated the facility at the time of release.
- Persons who generated hazardous waste disposed of or treated at the facility.
- Persons who arranged for the disposal or treatment of a hazardous substance at the facility.
- Persons who transported a hazardous substance for disposal or treatment at the facility, if the facility could not legally receive the substance.
- Persons who sell and provide written instructions for the use of a hazardous substance, if a person following those instructions causes the release.

All liable persons are jointly responsible for the costs of cleanup. A liable person is responsible for all costs and damages resulting from a release at a site regardless of relative fault for the release.

Local governments can apply for loans or grants to help cleanup up hazardous contamination sites that we supervise through our remedial action grant program.[19] Both the City and the Port have received remedial action grants to help with cleanup of Western Port Angeles Harbor.

[18] https://app.leg.wa.gov/rcw/default.aspx?cite=70.105D.040
[19] https://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Oversight-remedial-action-grants-loans

Additional Information Submitted During the Comment Period

Potential additional contamination source

One comment provided historical knowledge about another source that was not documented in the RI/FS report.

- "Shown on some old photos and waterfront maps, you can find a 50,000 gallon wood stave fuel tank located in the vicinity just north of the intersection of W Hill St and Marine Drive. This tank was removed decades ago. For many years, the tank provided fuel for the railroad that served timber related industries adjacent to the subject cleanup site. This wood stave tank leaked fuel oil into the surrounding soil for decades." George Titterness

Response

We appreciate learning about historical activities and information that may help us identify additional sources of contamination. This information may help us focus next steps and source control studies in Port Angeles.

Comments Reference Table

The comments received represented these comment topics:

- Support for the RI/FS report
- Cleanup unnecessary
- Cleanup costs
- Cleanup levels
- Cumulative impacts
- Data sufficiency
- Changes in benthic conditions
- Capping
- Dredging
- In-situ treatment
- Enhanced or monitored natural recovery
- Minimum requirements for cleanup alternatives
- Recommended alternatives
- No cleanup-action alternatives
- SMA 1 recommended alternative
- SMA 2 recommended alternative
- SMA 3 alternatives
- Source control
- Tribal concerns
- Wood debris and benthic toxicity
- Document presentation

Some commenters supported comments submitted by others.

In additional to these topics, one comment asked why the city and current owners are responsible for cleanup. Another comment provided new information on a potential source of contamination to the harbor.

The following table lists the commenters, the general topics of their comments, and the page number where the complete comment can be found in the next section.

Table 1: List of Commenters and Comment Topics

Commenter	Representing	Comment topics	Page number
Stephen McKenzie	Self	Cleanup costs, Responsibility for cleanup	44
George Titterness	Self	Potential additional contamination source	45
Anonymous Anonymous	Self	Cleanup costs, Cleanup unnecessary	48
(Greg) Anonymous Anonymous	Karl Spees, M.D.	Cleanup unnecessary	49
Terry Gallagher	Self	Support for the RI/FS report	50
Jim Haguewood	Self	Support for the RI/FS report	51
Roberta Mantooth	Self	Support for OEC comments	52
James Mantooth	Self	Support for OEC comments	53
Erika Shaffer	Washington State Department of Natural Resources	Capping, SMA 1 Recommended alternative, Source control, Document presentation	54
Wilfrido Rincón	McKinley Paper Company	Support for the RI/FS report	57
Grant Munro	Munroe LLC	Support for the RI/FS report	59
Howard Sprouse	The Remediators Inc.	In-situ treatment	60

Commenter	Representing	Comment topics	Page number
Marc Mendenhall	Port Angeles Hardwood LLC	Support for the RI/FS report	71
James McEntire	Port Angeles Business Association	Support for the RI/FS report, Cleanup costs	72
Gretchen Brewer	Port Townsend AirWatchers	In-situ treatment	73
Darlene Schanfald	Olympic Environmental Council	Cleanup levels, Cumulative impacts, Data sufficiency, Changes in benthic conditions, Dredging, Enhanced or monitored natural recovery, Recommended alternatives, No cleanup action alternatives, SMA 3 alternatives, Source control, Wood debris and benthic toxicity	74
Matt Beirne	Lower Elwha Klallam Tribe	Data sufficiency, Minimum requirements for cleanup alternatives, SMA 2 recommended alternative, Tribal concerns, Document presentation	83
Randy Johnson and Bill Peach	Clallam County Board of Commissioners	Support for the RI/FS report	86

This page is purposely left blank

Comments Received

From: stephen mckenzie
To: Davis, Nancy D. (ECY)
Subject: WESTERN PORT ANGELES HARBOR, Site 11907
Date: Tuesday, January 14, 2020 8:09:01 AM

THIS EMAIL ORIGINATED FROM OUTSIDE THE WASHINGTON STATE EMAIL SYSTEM - Take caution not to open attachments or links unless you know the sender AND were expecting the attachment or the link

Ms Davis,
RE: PLPs for Western PA Harbor clean up

As a property owner I am concerned for the economic well-being as well as the safety of the residents in Clallam County and Port Angeles. Can you explain to me why the burden of the cleanup is falling on the city and the present owners of contaminated property?

Isn't the contamination something that started decades before anyone knew to protect the environment? Unless the current owners have continued to intentionally pollute over the past 20 or so years it seems unfair for them to carry the burden of remediation. This is a public problem and the cost of cleanup should be born by all of the taxpayers in Washington state. How is this any different than the many Superfund cleanup sites across the country?

Naming the current owners and operators as potentially liable persons seems like your department is greatly overstepping its authority, arbitrarily placing economic burden on entities least able to afford it.

Please feel free to include this communication in your collection of public comments. I am sending this to you now because you're public comment mechanism is not yet in operation.

Stephen McKenzie
Owner of 1810 W 4th St, Port Angeles WA

Sent from my iPhone

January 16, 2020

George Titterness
97 Deer Trails Way
Sequim, WA 98382

Connie Groven
Cleanup Project Manager
Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Re: Western Port Angeles Harbor Cleanup – Public Comment
Remedial Investigation and Feasibility Study
Facility Site ID: 18898
Site Cleanup ID: 11907

Ms. Connie Groven

Thank you for the Department of Ecology's effort to clean up the important environmental, cultural, and multi-use site known as Western Port Angeles Harbor. I would like to provide comments for your considerations on a location upland of the subject cleanup site but having the potential to affect the western harbor for years to come.

Shown on some old photos and waterfront maps, you can find a 50,000 gallon wood stave fuel tank located in the vicinity just north of the intersection of W Hill St and Marine Drive. This tank was removed decades ago. For many years, the tank provided fuel for the railroad that served timber related industries adjacent to the subject cleanup site. This wood stave tank leaked fuel oil into the surrounding soil for decades.

In 2003-04, a trench was excavated to a depth of 4 to 5 feet below ground surface in close proximity to the fuel tank site. The trench very quickly filled about a foot deep with a very odorous blackish-brownish gooey fuel oil/water emulsion. The trench was backfilled. I am not aware of any cleanup of this area.

If the 50,000 gallon wood stave fuel tank leaked between one percent and five percent of its volume, per year for twenty years, there could be 10,000 to 50,000 gallons of fuel oil

underground and slowly working its way to the harbor. There are several abandoned pipes and culverts on this former industrial site that can act as conduits to transport the goo to other parts of the area.

This area is a valuable historic and culturally sensitive site. Any consideration of cleaning up this area would likely require the consultation and participation of the Lower Elwha Klallam Tribe.

I urge the Department of Ecology to pursue the cleanup of the area surrounding the location of the former 50,000 gallon wood stave fuel tank. It is a toxic site in need of cleanup.

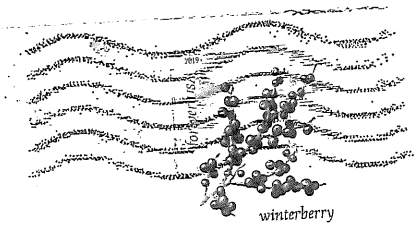
Sincerely,

George Titterness

George Titterness
97 Deer Trails Way
Sequim, WA 98382

George Titterness
97 Deer Trails Way
Sequim, WA 98382

TACOMA WA 983
OLYMPIA WA
16 JAN 2020 PM 2 L



Connie Groven
Cleanup Project Manager
Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

98504-7775

Anonymous Anonymous

This is an undue burden on taxpayers...to what end? The damage was done decades ago and time is the best solution at this point. Taxpayers are extremely weary and annoyed that unelected officials continue to drain our pocketbooks without voters having a say at the ballot box.

Anonymous Anonymous

On behalf of Karl Spees, M.D. (whose computer did not allow him to submit on this form), the following comment is submitted:

I am a scientist, a pragmatist, and a student of Natural history.

I will accept the premise that the historical PA Industries were producing some very toxic wastes at one time which they deposited in the harbor.

In today's Peninsula Daily News we have some public official who has come up with a reasonably expensive (multi-million dollar) solution to assuage the guilt trip the DOE has laid on the current inhabitants of Port Angeles. (Minimal improvement of the real problem but at a very large expense to the current general public.)

Here is the reality. Mother Nature has a phenomenal ability to heal herself. The best solution to a defiled-environment is to quit doing the destructive activity. Time heals all (mostly). The defiling of PA harbor has ceased many decades ago. Most of the problem has eroded away, been diluted, or has been embedded in a layer of silt. Ten thousand years from now the PA pollution of the 50's, 60's and 70's will be a thin line in a sedimentary mud or rock which is part of a mountain or ridge. (OK the layer could still be in some ocean location.) (Mother Nature herself has deposited some toxic materials in rock formations.) The bottom line is that if we 'do nothing', the crabs and shrimp of PA harbor will be nontoxic and edible. The Salmon traditionally bypass the harbor going to sea and returning. Doing it for the Salmon (or the children) is just emotional gibberish, blackmail. (The real reasons for our salmon resource's precipitous decline is a politically-incorrect cause which is unmentionable in bureaucratic circles.)

The Pragmatic Solution to our polluted PA Harbor is to 'do nothing'. "Stop the damaging behavior and "DO NOTHING!" Nothing will be lost and the problem which has already virtually disappeared will continue to be less of an issue.

Of course this policy will not satisfy the DOE, which makes this proposal unacceptable. (The DOE is about politics and control not acting on behalf of the WA State Citizens and the Environment.)

Karl Spees, M.D., Student of Natural History

February 29, 2020

Connie Groven
Cleanup Project Manager
Southwest Regional Office
Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Re: <u>Western Port Angeles Harbor Cleanup RI/FS</u>

Ms. Groven:

I would like to provide comment regarding the draft Western Port Angeles Harbor cleanup plan, officially the Remedial Investigation/Feasibility Study. To provide context, I retired from the Port Angeles police chief position in March 2016. Perhaps more importantly. I am a member of a pioneer family that settled in the Clallam County area circa 1887.

As you no doubt know the plan was produced through a cooperative effort between the five Potentially Liable Persons (PLP's): City of Port Angeles, Port of Port Angeles, Merrill & Ring, Nippon Paper Industries, and Georgia Pacific. It is the result of more than ten years of study that involved extensive public outreach and includes protections for important cultural and ecological resources.

I am not qualified to speak to the science behind the document. I can, however, speak to the integrity of the process and the commitment of those involved in producing the draft plan. The RI/FS is a serious effort on the part of the PLP's to identify an economically viable path to a healthier Port Angeles harbor.

I am pleased to add my name to the list of those in support of the draft RI/FS as proposed.

Respectfully,
S/Terry Gallagher

JIM HAGUEWOOD

Comment – Western Port Angeles Harbor Sediment Cleanup Unit – Remedial Investigation/Feasibility Study (RI/FS) and Amendment to the Agreed Order

Comments by Jim Haguewood, resident of Port Angeles

I support the RI/FS that has evaluated a range of cleanup alternatives for the subareas and provides the greatest degree of benefits, including protection of human health and the environment, within in a reasonable timeline and cost.

The preferred cleanup plan is a result of over a decade of study. A group of five public and private entities have worked cooperatively with the Department of Ecology to agree to a science-based plan that is cost-effective, using a proven implementation approach and meets the requirements of the Model Toxics Control Act, RCW Chapter 70.105D.

In the best interests of the citizens of the State of Washington and most importantly the residents and visitors of Port Angeles, please move this clean-up plan forward and get the job done.

Roberta Mantooth

Please give serious consideration to the comments from Olympic Environmental Council based on analysis by its technical consultant Dr. Peter deFur, which OEC has submitted to you. The harbor is important to the well-being of our economy and ecology. Friends of Ennis Creek wants to be confident the fish that spend time in the harbor and their food sources in that area will not be contaminated.

James Mantooth

Please give serious consideration to the comments from Olympic Environmental Council based on analysis by its technical consultant Dr. Peter deFur, which OEC has submitted to you. The harbor is important to the well-being of our economy and ecology. Friends of Ennis Creek wants to be confident the fish that spend time in the harbor and their food sources in that area will not be contaminated.

DEPARTMENT OF NATURAL RESOURCES

Aquatic Resources Division
PO Box 47027
Olympia, WA 98504-7027

360-902-1100
ARD@DNR.WA.GOV
WWW.DNR.WA.GOV

March 13, 2020

Ms Connie Groven
Department of Ecology
Southwest Regional Office
300 Desmond Dr SE
Lacey, 98503-1274

Subject: Western Port Angeles Harbor RI/FS

Dear Ms. Groven:

The Washington State Department of Natural Resources (DNR) would like to thank you for the opportunity to comment on the Remedial Investigation/Feasibility Study for the Western Port Angeles Harbor site.

DNR's comments are based on principles of stewardship and proprietary management derived from our statutorily defined goals to protect State-Owned Aquatic Lands (SOAL) and manage them for the public's benefit. We appreciate Ecology's consideration of these and any future comments related to the investigation and cleanup of the site.

-The document as a whole relies on large amounts of information that is presented primarily in appendices; adding additional summary information in the main text to reduce the amount of cross referencing required would make the document more accessible.

-Engineered caps are a major component of the selected remedy for SMA 1, primarily on State-Owned Aquatic Lands. Because engineered caps typically require institutional controls that may encumber future uses of SOAL, including restrictions on anchoring, they require authorization from DNR. This authorization will be necessary for not only the cap itself but for ongoing maintenance and monitoring for the lifetime of the cap.

-Additionally, much of the area where capping is to be performed is used for industrial and port activity. The proposed method of management of the risk of damage to the cap from scour, anchoring, and other activities, including eventual replacement of improvements at the end of life, is not clear. Additionally,

DEPARTMENT OF NATURAL RESOURCES

Aquatic Resources Division
PO Box 47027
Olympia, WA 98504-7027

360-902-1100
ARD@DNR.WA.GOV
WWW.DNR.WA.GOV

given the depositional nature of the inner harbor, will it be possible to maintain navigational depths over time if potential dredging is restricted by the presence of a cap?

-No action areas defined by a 50 foot offset from overwater structures also coincide with much of the areas of potential scour in SMA 1. Contaminated sediments in these areas could be mobilized and contribute to recontamination of the capped area. While DNR understands the practical infeasibility of dredging and engineered capping in these areas, some alternatives, such as ENR with or without amendment by activated carbon, should have been considered.

-While much of the harbor passed bioassays for toxicity, there were bioassay failures in the SMA1 and SMA2 areas. These are the areas of some of the heaviest wood waste accumulation as well as the highest porewater sulfides, suggesting that in these areas anaerobic decay of wood waste is still ongoing. If a cap is constructed, monitoring for the upwelling of sulfides from anaerobic decay of wood waste should be conducted in those areas.

-Limitations on sediment disturbing work in the cap area will also inhibit creosote piling removal efforts; creosote pilings are specifically cited as a source control issue. DNR is concerned about recontamination from these pilings and the appropriateness of a cap that would restrict that source control work.

-Due to the small size of the removal portion of the preferred remedy, the vast majority of contamination on SOAL will remain in the environment. It is not clear that the amount of removal of contaminated sediments would truly meet the public desire to reduce risks from ongoing contamination by removing contamination from the harbor, particularly with respect to the potential for damage to the cap during normal activity in the harbor.

-Since source control will be administered through other Ecology programs, it would be helpful to have an overview of how coordination between source control and cleanup will be conducted for this site.

-The remedy selection rationale for SMA 2 included the limits on access to the area because of its location on private property; however, it is connected to the harbor via the channel, which is also a no action area. Additionally, there is not sediment data from the channel, so its sediment quality is unknown. How will the potential for this to be a source to areas that do have public access in the harbor be limited?

DEPARTMENT OF NATURAL RESOURCES

Aquatic Resources Division
PO Box 47027
Olympia, WA 98504-7027

360-902-1100
ARD@DNR.WA.GOV
WWW.DNR.WA.GOV

Ms. Connie Groven

March 20, 2020

-The channel between the harbor and lagoon, terminal berthing areas, and sections of erodible shoreline are all cited as potential sources of contamination, but are all considered to be part of no action areas. These sources do not appear to be sufficiently addressed in a source control evaluation. Additionally, much of these areas are considered to be areas of direct contact exposure and/or sessile seafood exposure, presenting a risk to the public who may access the areas for recreation or fishing activities, either at present or in the future.

Sincerely,

Erika Shaffer
Sediment Quality Unit

Department of Ecology
Southwest Regional Office
PO Box 47775
Olympia, WA 98504-7775
Attn: Connie Groven
Cleanup Project Manager

2020-03-06

Re: MPC Comments on RI/FS Port Angeles Harbor

Ms Groven,

We at McKinley Paper Company ("McKinley") write concerning the remedial investigation and feasibility study (RI/FS) for the western Port Angeles Harbor (FSID # 18898; CSID # 11907), released January 16, 2020 for public comment.

McKinley is the owner of private property within the area studied in the RI/FS, including what is called the "lagoon," so we have a special interest in what the RI/FS proposes, especially for work proposed for the areas on and near our property.

McKinley is at a critical stage of re-starting pulp and paper production at its mill on the western Harbor. Since McKinley bought the mill in Port Angeles in 2017, we have designed and installed a complex and expensive processing system to re-configure and re-start the mill using recycled paper exclusively. In addition to meeting the state's need for consumption of recycled paper and production of eco-friendly paper, the restart allows McKinley to employ workers skilled in paper production in jobs that add great benefit to the local economy. We are currently in the process of resuming paper production as we write this.

Our re-started mill operations require that we operate on or have uncompromised access to literally every square meter of our property, which is already geographically constrained. Our mill will require truck shipments into our mill of recycled paper including old cardboard and outbound shipments from our mill of our paper products. This requires free-flowing truck access along Marine Drive and within our mill facility, including the ability to route truck traffic to avoid waits and delays. We will be operating 24/7 and 365 days per year.

7850 Jefferson St NE #150
Albuquerque, NM 87109
505.224.2300

1815 Marine Dr
Port Angeles, WA 98363
360.565.7070

County Rd. 19
Prewitt, NM 87045
505.972.2100

For these reasons, we write to urge the Department of Ecology to accept the preferred cleanup remedies proposed in the RI/FS for the sub-areas, called sediment management areas (SMAs). They are consistent with the state environmental cleanup regulations.

McKinley is opposed, however, to more extensive work that is not necessary to protect human health and the environment and that could impede or interfere with our re-started mill operations. While we are concerned about the extent and impact of the proposed intertidal excavation and capping described in the preferred alternatives for the SMAs, we know that if the areas to receive that treatment were to increase or the work required were more intrusive, it would have an adverse effect on our operations of the mill. While impacts to operational efficiencies are a primary consideration, we are also very concerned about public and worker safety, given the volume of truck traffic that will be moving in and out of the mill for paper production.

We ask that Ecology please accept this public review draft of the RI/FS and allow this process to move on.

Feel free to contact me if you have any further questions or comments on the matter.

Best regards,

Wilfrido Rincón
Managing Director
Bio-PAPPEL | McKinley Paper USA
rinconw@biopappel.com

munro llc

Comments for Facility Site ID:18898
Site Cleanup ID: 11907

Connie Groven
Cleanup Project Manager
SW Regional Office
Dept. of Ecology

Dear Sirs:
I am wishing to comment on the Western Port Angeles Harbor Cleanup project. I have been actively involved in this community for over 30 years with time spent on the City of Port Angeles Council as well as a board member on many significant organizations in this community. Thus I believe that I speak as a well informed member of this community.
It is critical that this project move ahead in the current preferred cleanup alternative and schedule. We have watched as so much time has been wasted with the Rayonier cleanup project where an important site is tied up and not contributing to the local economy. The preferred alternative gets this project done expeditiously , in a reasonable cost to the companies involved, and without further harm to the environment.
I support moving ahead quickly with the currently suggested preferred alternative.

Sincerely,
Grant Munro

The Remediators Inc

Department of Ecology
Connie Groven
Cleanup Project Manager
Southwest Regional Office
P,O. Box 47775
Olympia, WA98504-7775
Re: Port Angeles Harbor Cleanup Site Cleanup ID 11907
The preferred cleanup remedies of intertidal excavation, intertidal capping and the final selection of cleanup actions under consideration are intended to provide for the long term safety of the public and restoration of the environment in the most comprehensive and cost effective way. The modern bioremediation technologies we employ have been reviewed and approved by the EPA and the California Department of Toxic Substance Control. We have many successful projects in Superfund Sites, large industrial cleanup sites and private cleanup sites in 8 states within the lower 48 states and Alaska with several more beginning this year. The Integrated Biological Approach to bioremediation used by us and project partners at NASA/Ames Research Center relies on a combination of plants, microbes, and fungi for remediation of mixed contaminants of soil and groundwater. The technology combines patented plant/microbe pairings originating from and licensed through the University of Washington Forest Science Laboratory with fungi from our library of thoroughly tested fungal strains for remediation use. This process can deconstruct organic toxins completely as well as remove inorganic toxins and metals and concentrate them within the plant tissue effectively and at less cost than most other remediation technology. A trial using specially prepared biochar made for use within a thin-layer sand cap trial conducted from the Ashland Chemical Superfund Site on Lake Michigan outperformed 'Sedimite' and Granulated Activated Carbon (GAC), both for prevention of migration of toxins as well as providing a restorative function to the cap. These technologies are flexible, efficient, and restore the sites they are used on to a healthy condition. By combining these technologies as appropriate we are able to treat hard to treat as well as mixed contamination simultaneously with visible improvements to the site, often with minimal disturbance to the ground through our specialized application methods.Information on specific contaminants, site specific treatments, and supporting validation literature will be provided on request as well as presenting a sysnopsis of our previous and ongoing work.The addition of these technologies within existing treatment options provided for in the Port Angeles Harbor Cleanup will ensure that when completed the contamination is not simply covered up, rather the site is clean and restored to a healthy safe condition.

Ashland Laboratory Study

Estimation of Floatable Sheen from Sediment Disturbance and Sand Cap Efficacy Studies

Meg Pinza, Jay D. Word, Jack Q. Word

9/22/2011

Results of the laboratory trials indicate that a floatable sheen will be produced during any sediment removal project and mitigation controls should be instituted. All cap treatments prevented breakthrough of contaminants to sediment surface but the amended sand treatments of biochar, granular activated carbon and SediMite™ (in that order) prevented vertical migration of contaminants better than the unamended sand cap.

Mycoremediation and the Integrated Biological Approach

Mycoremediation of Environmental Pollutants

Petroleum based contamination of soil and water are a major threat to the health of our ecosystems and human heath. Cleanup costs for these often hard to treat contaminants have imposed an enormous financial burden on society with negative effects on land values. As a standalone treatment for petroleum contamination mycoremediation has achieved 'non-detects' in as little as a few months' time. The fungal metabolization of hydrocarbons creates no toxic waste stream with carbon dioxide and water being the final product of decomposition. Mycoremediation in an integrated bioremediation system represents the state of the art in bioremediation technology. We combine the use of specifically selected fungal treatments with phytoremediation plant / microbe combinations that have been proven successful in field applications to treat a variety of pollutants. This newly developed approach allows an effective solution for a broad range of organic and inorganic pollutants as well as being the least costly.

Fungi are natures' recyclers. They secrete enzymes into their environment that break down organic compounds. These compounds are chemically broken down into simpler ones which then become available to the growing fungi and other organisms. The degradation of lignin and cellulose are primary sources of energy for most fungi and lignin is a natural analogue of petroleum based hydrocarbons. Fungi can degrade a variety of petroleum hydrocarbons including aromatic (PAHs, dioxins) and chlorinated (PCBs, DDT) compounds. Enzymes responsible for this can likewise deconstruct inorganic compounds and metals which then become available to microbes and plants within our combined bioremediation systems.

Mycelium, where mushroom meets toxin. Mycelium, the rootlike structure that comprises the bulk of these fungal organisms, exist in an interconnected web of microscopic threads called hyphae that penetrate their environment. A gram of healthy soil can contain hundreds of meters of fungal hyphae. Fungal growth is dependent upon nutrients and minerals that the mycelium encounters that are degraded by enzymes secreted by the mycelium and then reabsorbed as their primary food source. It is in and around the mycelial network that the remediation occurs. Our Mycoremediation treatments consist of live fungal mycelium in cellulosic carriers optimized to meet specific project needs.

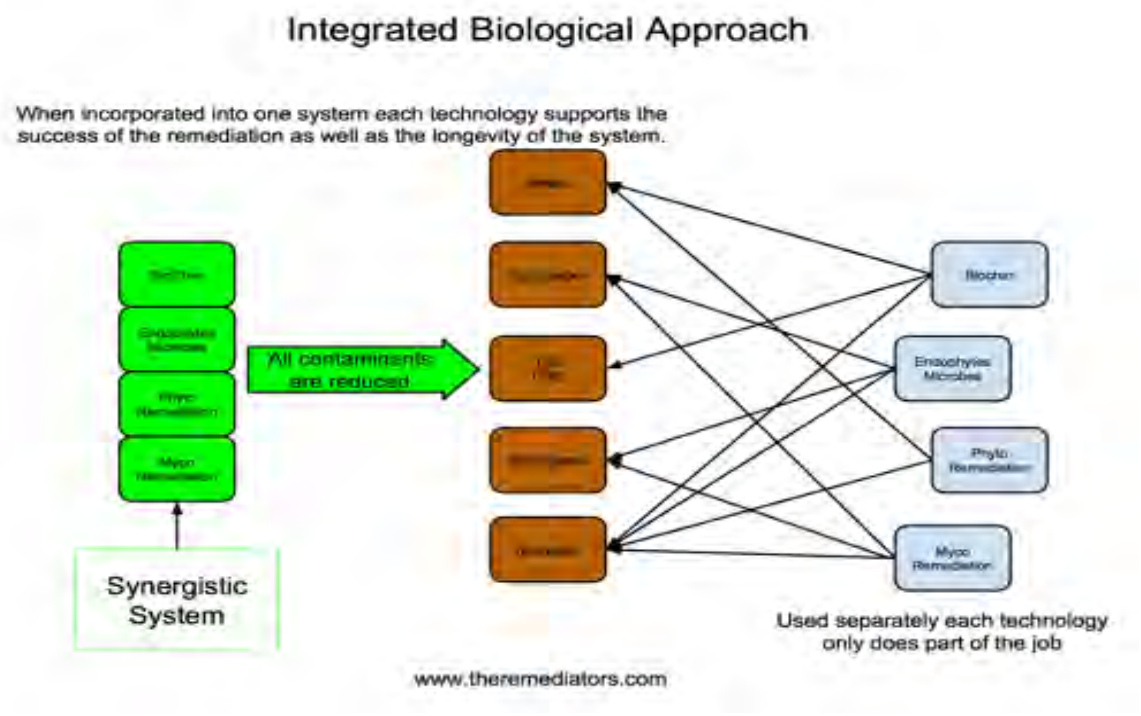
- Eliminates the need for offsite disposal of soil.
- There are no downstream negative effects from the process. The conversion of toxins transforms them to mostly CO2 and Water.
- MycoRemediation A "Green" technology. The materials used can be helpful in restoring soil health.
- The decontaminated soils may be reused, or left in place as an in-situ process.
- Minimal monitoring and no mechanical infrastructure.

Each fungal strain is thoroughly tested for the ability to decontaminate a range of toxins and for growth under different conditions.

Our process has been used successfully in the United States and Canada in the remediation of petroleum hydrocarbons and was approved by the US Navy's Facilities Engineering Service Center (NFESC) as an innovative technology suitable for their environmental program.

A Living Partnership: The Integrated Biological Approach.

Soil bacteria grow and travel in the film surrounding the mycelial hyphae more efficiently than in soil or water without hyphae, giving these microbes direct access to their food source. These interactions also support the transfer of genetic material within these populations which supports greater diversity and vitality. These factors translate to more rapid decomposition of toxic compounds that are also made



accessible for uptake into the roots of plants used in the remediation. The partnership between fungi, soil bacteria, and hyper accumulating plants allows for the successful treatment of many hard to treat toxins as well as increasing the performance of each component of the system. The Integrated Biological Approach is our remediation 'toolbox' and constitutes latest state of the art of bioremediation.
For effective and affordable treatment of contaminated soil, sediments and water feel free to contact us for more information.

The Remediators Contact:

Howard Sprouse CEO
The Remediators Incorporated
Email hsprouse@theremediators.com 1-773-609-2427
Website www.theremediators.com

TABLE 9 SUMMARY OF TOC/TC AND TOTAL SOLIDS DATA

Core	Sand			SediMite™			Biochar			GAC		
Depth	TOC	TC	TS	TOC	TC	TS	TOC	TC	TS	TOC	TC	TS
0-1				0.02 U	0.02 U	76.0	0.02 U	0.02 U	78.7	0.02 U	0.02 U	77.8
1-2				0.02 U	0.02 U	76.2	0.02 U	0.02 U	77.3	0.02 U	0.02 U	78.1
2-3	0.02 U	0.02 U	73..3	**7.28**	**7.30**	72.5	**5.47**	**6.21**	77.6	**12.0**	**12.9**	75.4
3-4				0.02 U	0.02 U	76.6	0.028	0.022	77.2	3.44	4.11	77.0
4-5				0.02 U	0.02 U	75.5	0.02 U	0.023	77.0	0.02 U	0.024	77.2

In addition to physical analysis, the deepest section of each core was analyzed for SVOCs to establish if the contaminant layer was migrating through the cap. The results of this analysis are provided in Table 10. The SVOCs were detected at a much higher concentration in the sand cap (10,590 ug/kg dry wt.) than the amendments. All of the amended sediment had reduced concentrations of SVOCs compared to the sand cap by at least 25 and as much as 50-fold. Biochar appeared to be the most efficient at reducing the migration of the contaminated layer followed by GAC and then SediMite™ (approximately half the concentrations observed in the other amended sand cap treatments).

The dominant compounds within the different treatments changed depending on treatment type; phenanthrene was found at the highest concentration in the sand, GAC, and biochar treatments whereas naphthalene compounds were the most dominant in the SediMite™ treatment. This observation may be related to SediMite™ pellets moving somewhat vertically through the cap and absorbing or entraining the contaminants. In any case, the sand cap had higher concentrations of contaminants than any of the amended treatments; therefore if the restorative layer is selected as the preferred option for the Ashland waterfront site, the restorative layer should include the addition of an amendment.

CONCLUSIONS

The summary findings as a result of laboratory studies conducted on selected cores from Chequamegon Bay, Lake Superior are:

1. There is a distinct silty sand contamination layer of free floating product mixed with pebbles varying in depth from approximately 1 ft to 3 ft below the sediment surface depending on the station location. This layer is comprised of PAH compounds similar to sediment samples collected from URS in 2001; most likely derived from petrogenic sources related to on-shore activities. *Based on boring logs advanced both on shore at Kreher Park and off shore in the bay sediments, this sandy material corresponds to granular materials underlying the wood chip/ reworked sediments at varying depths from elevation 591 to 595 msl. This granular unit is in turn underlain by soft to firm silts and/or stiff to hard clay. At some sediment sample points contaminants have penetrated the silt. Monitoring wells screened in the sand at the shoreline have historically encountered both dissolved and more recently free-phase hydrocarbon. Prior to initiating any sediment dredging or removal operation, the granular materials at Kreher Park should be contained*
2. The measured PAH compounds within the contamination layer are mobile and move within the sediment column both in an upward as well as downward direction.
3. The PAH compounds will migrate from the sediment to the water surface during dredging operations (4% of measured compounds were found in the elutriate preparations). *Mitigation measures such as containment booms should be employed to address floatable products that will surface during dredgi*ng. Under this method at least 4% of the contamination in the sediment will be mobilized to the surface of the water.

4. The concentrations in the sand cap were more than fifty times as high as the biochar treatment and more than 20 times higher than the GAC or SediMite amendment. *A restorative layer should include a sand cap amended with a carbon source. Additionally, the biochar amendment appears to enhance the carbon nutrient quality of the sand which could promote more rapid recolonization of the returning benthic community.*

TABLE 10 SUMMARY RESULTS FOR SEDIMENT CORES

Analyte *(conc. = ug/kg,dry)*	**Clean sand**	**SediMite™**	**Biochar**	**GAC**
Phenol	< 60	< 63	< 64	< 64
2-Methylphenol	< 60	< 63	< 64	< 64
4-Methylphenol	< 60	< 63	< 64	< 64
2,4-Dimethylphenol	< 60	< 63	< 64	< 64
Naphthalene	**84**	**270**	< 64	< 64
2-Methylnaphthalene	**780**	**130**	< 64	**80**
1-Methylnaphthalene	**580**	**96**	< 64	< 64
Dimethylphthalate	< 60	< 63	< 64	< 64
Biphenyl	**120 J**	**12 J**	< 64	< 64
Acenaphthylene	< 60	< 63	< 64	< 64
Acenaphthene	**1200**	< 63	< 64	< 64
Dibenzofuran	**77**	< 63	< 64	< 64
Diethylphthalate	< 60	< 63	< 64	< 64
Fluorene	**520**	< 63	< 64	< 64
Pentachlorophenol	< 300	< 320	< 320	< 320
Dibenzothiophene	**120 J**	< 63	< 64	< 64
Phenanthrene	**2100**	< 63	**140**	**160**
Carbazole	< 60	< 63	< 64	< 64
Anthracene	**550**	< 63	< 64	< 64
C(1)-Ph/An's	**920 J**	< 63	< 64	< 64
Cyclopentaphenanthrene	**180 J**	< 63	< 64	< 64
Di-n-butylphthalate	< 60	< 63	< 64	< 64
Fluoranthene	**620**	< 63	< 64	< 64
CyclopentaPh/An	**240 J**	< 63	< 64	< 64
Pyrene	**990**	< 63	**72**	**86**
Butylbenzylphthalate	< 60	< 63	< 64	< 64
Benzo(a)anthracene	**270**	< 63	< 64	< 64
bis(2-Ethylhexyl)phthalate	< 60	< 63	< 64	< 64
Chrysene	**250**	< 63	< 64	< 64
Di-n-octylphthalate	< 60	< 63	< 64	< 64
total Benzofluoranthenes	**240**	< 63	< 64	< 64
Benzo(a)fluoranthene	**70 J**	< 63	< 64	< 64
Benzo(e)pyrene	**140 J**	< 63	< 64	< 64
Benzo(a)pyrene	**240**	< 63	< 64	< 64
Perylene	**40 J**	< 63	< 64	< 64
Indeno(1,2,3-cd)pyrene	**89**	< 63	< 64	< 64
Dibenzo(a,h)anthracene	< 60	< 63	< 64	< 64
Benzo(g,h,i)perylene	**120**	< 63	< 64	< 64
Anthanthrene	**50 J**	< 63	< 64	< 64
Sum of detected SVOC	**10590**	**508**	**212**	**326**

RESTORATIVE LAYER RESULTS

The restorative layer experiment was initiated on 5/15/11 and the experiment was terminated on 7/14/11. One hundred grams of contaminated sediment created from contaminated sections typically 13 inches or more below the sediment surface from several stations was used as a worse case residual material. The test aquaria were monitored daily for signs of any contaminant breakthrough of the sand cap including visual observance of product either floating on water surface of present in the sediment, any noticeable odors representative of petroleum, and the volume of water passing through the system was measured daily.

GENERAL OBSERVATIONS

A lighter colored sand layer approximately 0.25 inches in thickness was observed in all of the treatment tanks at the surface of sediment layer. This lighter colored layer is thought to be associated with the finer sand particles settling out of the sand surface. Over time green and red algae were observed in most treatment tanks; the biochar treatments had the most predominant growth.

SediMite™

A SediMite™ pellet was noted on the surface of one tank approximately one week after the start of the experiment. This pellet migrated up through the sand cap from the three inch depth. Additionally, there was a noticeable upward migration pattern from the SediMite™ layer towards the surface of the sand cap. This pattern was noted for all three treatment replicates and is illustrated in Figure 13.

FIGURE 13 SEDIMITE™ VERTICAL MIGRATION PATTERN, PELLET ON SURFACE

BIOCHAR

The biochar treatments all showed a black cloud pattern diffusing in all directions from the three inch layer (Figure 14). Algal growth was most prevalent in biochar treatments in association with the black cloud pattern which may indicate that this amendment has the most available carbon to promote more rapid benthic recolonization of the cap.

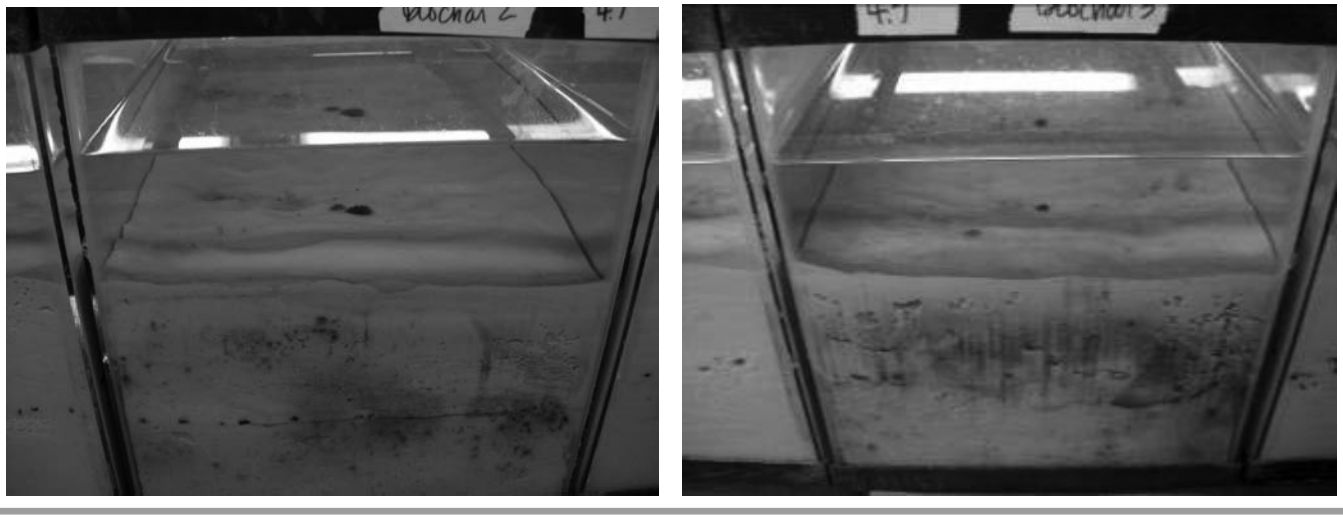


FIGURE 14 BIOCHAR DIFFUSION PATTERNS AND ALGAL GROWTH

Granular Activated Carbon (GAC) – Pellet Form

The GAC treatments had no vertical movement from the three inch depth layer as shown in Figure 15. There was also no observed algal growth associated with any of the GAC replicates.

FIGURE 15GAC TREATMENT REMAINS AT THREE INCH DEPTH INTERVAL

Oil and Gas Endophyte-Enhanced Tree Phytoremediation plus Mycoremediation

Crude oil and gas pollution originate from many sources and can include activities such as unintentional spills of organic pollutants, leaking storage tanks, and oil and gas exploration, extraction, and transportation that can contaminate soils and sediments, groundwater, and surface water. Traditional cleanup of petroleum hydrocarbon pollutants is costly, not only financially but also environmentally. In some cases, traditional remediation treatments are unsuccessful at removing a sizable portion of pollutants that were accidentally released into the environment. In other cases, low, yet reportable, levels of recalcitrant petroleum hydrocarbon pollutants persist after initial cleanup, making it difficult to close sites. Our team provides remediation assessment, direction and new solutions to assist in the stabilization and remediation of these contaminants from polluted environments, and the mitigation of risks associated with these sites. Intrinsyx and PPCU utilize poplar tree-endophytic bacteria in many different groundwater loving trees combined with the Remediators fungal soil mycelium to effectively remove and degrade petroleum hydrocarbon pollutants (BTEX, TPH, PAH's, etc.) in groundwater and soil using a combined poplar tree phytoremediation and mycoremediation system.

Advantages of using plants inoculated with endophytic bacteria that degrade petroleum hydrocarbons.

Trees inoculated with our highly-specialized bacteria significantly increase the degradation of petroleum pollutants in soil and water by as much as 40% versus controls containing un-inoculated plants, and considerably more than no treatment at all. In addition, plants containing these specialized endophytic bacteria have demonstrated higher root and shoot growth as well as no signs of phytotoxic effects from petroleum pollutants, even at traditionally phytotoxic concentrations. In fact, these endophytic bacteria even facilitate increased uptake of pollutants into the plant tissues for degradation, which is especially important for recalcitrant hydrocarbons. In the image shown above, willow trees were inoculated (left 3 trees), or un-inoculated (right 3 trees), and grown in soil containing phytotoxic concentrations of phenanthrene (Khan et al. 2014). Thankfully, these specialized endophytic bacteria can be used with any plant species, and the inoculation of plants can occur at the time of planting or on established trees, shrubs, herbs and grasses!

Plant endophytic bacteria that degrade chlorinated solvents and pesticides.

Some petroleum hydrocarbon impacted sites also contain chlorinated solvents or persistent organic pesticides, or even explosives! In addition to our petroleum hydrocarbon degrading poplar endophytes we have tree endophytes that degrade chlorinated molecules and explosives like TNT and RDX.

Soil mycoremediation. Fungi naturally breakdown organic compounds from the soil in which they reside. They inherently degrade a variety of petroleum hydrocarbons including aromatic (PAHs, dioxins) and chlorinated (PCBs, DDT) compounds. Degradation of these organic pollutants results in the creation of water and carbon dioxide, leaving no contaminants behind. In addition to the degradation activities of these beneficial fungi for remediation of organic pollutants, they also provide benefits to the plants used for phytoremediation by helping to make mineral nutrients more bioavailable as well as confer greater environmental stress tolerance to biotic and abiotic factors.

Combined Tree Bio-Phytoremediation and Mycoremediation Applications. Combining endophyte-enhanced phytoremediation with mycoremediation has the potential to dramatically increase the remediation efficiency and effectiveness of organic polluted sites over any other green technology on the market; and, this system is vastly less expensive than traditional remediation approaches. Our system is designed to work together to increase remediation efficiency from the time of implementation to closure and reduces the total time to remediate using biological organisms. To top it all off, the technologies discussed in this paper are isolated from nature and are completely safe to humans and the environment, and do not require specialized permitting for use. Many sites we encounter are contaminated with multiple pollutants and we have found that this multifaceted approach is ideal because we can address multiple contaminants of concern concomitantly.

Our endophytic plant bacteria and soil fungi are compatible with most plant species. That means we can customize our remediation approach specific to the site's geographic region, site conditions, chemical characteristics, and depth of pollutant(s). Plant selection can take into consideration any desire for native plants as well as future plant biomass use for timber or bio-fuel related applications. This combined system allows us to address multiple pollutants at many depths. We can address:

- Soil contamination at shallow depths and deeper due to the trees
- Groundwater contamination at 30 feet below ground using high-transpiration water loving trees. Trees like Poplar, Willow, Ash and Alder are quite useful in this regard. These trees generally grow in freshwater aquifers where the water table depth is not more than ten meters.
- Aquatic systems requiring water and/or sediment remediation

John L. Freeman, Ph.D.
Chief Science Officer
Intrinsyx Environmental
Email: jfreeman@intrinsyx.com
Cell: 650-210-9219
www.intrinsyxenvironmental.com

Howard Sprouse
President and CEO
The Remediators Inc.
Email: hsprouse@gmail.com
Cell: 360-565-2065
www.theremediators.com

Christopher M. Cohu, Ph.D.
CEO and Cofounder
Phytoremediation and Phytomining Consultants United
Email: cohu.ppcu@phytoconsultants.com
Cell: 970-319-3316
www.phytoconsultants.com

CLEANING UP THE CLEANUP

MPC Brings Sustainability to Environmental Remediation

Environmental remediation involves removing contaminants from water and soil to protect human health and restore the environment; however, certain remediation activities can generate emissions or other waste products that impact the environment. MPC is moving to the forefront of the oil and gas industry with plans for a new company-wide approach to remediation projects that incorporates a sustainability evaluation.

The trees planted at the Alaska site support phytoremediation, which relies on the natural processes of plants and trees to mitigate the effects of contaminants.

Framing the Bigger Picture

The program's foundation is an assessment that identifies opportunities for reducing a project's anticipated amount of greenhouse gas, air emissions, energy use, waste, water use and raw materials. This can lead to switching remediation technology, exploring greener options in the supply chain or introducing new habitat features. The assessments aim to go beyond environmental concerns to address the broader potential of this work to positively affect surrounding communities.

"We are looking to factor in stakeholder inclusion and evaluating software tools that could gauge economic and social factors for more complex sites," said Kyle Waldron, HES professional in Environment, Safety, Security and Product Quality (ESS&PQ). "Considering economic and social factors may allow remediation projects to provide value to the local community through the use of low-impact solutions and by identifying reuse opportunities for the remediation resources."

This tactic is expected to help shorten the use of mechanical systems at the site by at least seven years, adding to the benefits of using more energy-efficient equipment for other tasks. Together, these measures are calculated to reduce carbon dioxide (CO_2) emissions during the project's lifecycle by roughly 90 tons, which is equivalent to the energy use of 10.8 average homes in one year.

Advantages Made in the Shade

In developing its sustainable remediation program, MPC is conducting pilot testing at two company remediation sites. It is also drawing upon successful initial results from a remediation effort at a former Andeavor fuel terminal in Alaska. This undertaking has shown sustainability can create substantial cost advantages, especially when it includes planting trees (phytoremediation) to mitigate the effects of petroleum contaminants. Remediation has added 550 balsam poplar trees to the three-acre site.

"Prior to planting the trees, they were inoculated with specific bacteria that have the ability to degrade the contaminants of concern at the site," Waldron said. "When the trees are fully mature after approximately four years, they will take up groundwater at a rate that significantly reduces groundwater flow across the site, and treat the water through their natural processes, eliminating the expense of operating a mechanical pump and treatment system."

Port Angeles Hardwood LLC
333 Eclipse Industrial Parkway
Port Angeles, WA 98363

March 3, 2020

Connie Groven
Cleanup Project Manager
Southwest Regional Office
Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Re: Comments, Western Port Angeles Harbor Cleanup
Facility Site ID: 18898
Site Cleanup ID: 11907

Dear Ms. Groven:

Port Angeles Hardwood is a thriving company that provides high quality Alder, Maple, Cottonwood and Birch hardwood lumber for furniture and cabinet industries worldwide. Our Port Angeles facility has 72 full-time employees and is dependent on a healthy, functioning Port Facility for delivering logs to supply our mill.

We have reviewed both the Remedial Investigation/Feasibility Study (RI/FS) and Amendment to the Agreed Order (DE 9781) as relates to the Western Port Angeles Harbor Cleanup. We feel that the comprehensive study and the preferred cleanup remedy identified, a combination of excavation, capping and enhanced monitored natural recovery (EMNR) are fact/science-based after analysis of the historic contamination, feasibility of alternatives and possible future uses of WPAH.

We feel that the draft RI/FS that the WPAH Group, five public and private entities, in cooperation with Ecology, has found a cost-effective remedy for the three sediment management areas and that with implementation of the various remedies will meet the standards for cleanup in the Model Toxics Control Act, RCW Chapter 70.105D.

In summary, we agree with the preferred cleanup remedy supported by the thorough study initiated by Ecology in 2008, as well as compliance monitoring to ensure success over the long-term. We feel that it is time to move forward with the cleanup to assist mother nature and make Western Port Angeles Harbor safe for human health, wildlife and the environment. We feel that the time to act is now, with minimal disruption to Port operation and traffic flow, after full input of the public through the comment period, and that Ecology should finalize this plan.

Sincerely,

Marc Mendenhall
Chief of Operations
Cascade Hardwood Group

333 Eclipse Industrial Parkway, Port Angeles, WA 98363
Office: (360) 452-6041 Fax: (360) 417-6805 www.cascadehardwood.com

Port Angeles Business Association

The Port Angeles Business Association is happy to provide the following comments on the Port Angeles Western Harbor Cleanup Remedial Investigation/Feasibility Study:

1. The preferred alternative looks to have struck a reasonable balance between cleanup outcomes and input costs. To our knowledge, it will involve proven cleanup methods in use around the world. We support the preferred alternative.

2. Get it done! Port Angeles does not need a repeat of the failing effort to remediate the former Rayonier Mill site in the eastern Port Angeles harbor and upland area. That effort is still seemingly stuck – an unacceptable cleanup plan, coming decades after the mill closure, with no end yet in clear view.

3. We note that the contaminated sediments are the result of decades of legal industrial and manufacturing activities. The harmful effects of industrial and manufacturing byproducts were either unknown or not very well appreciated while those activities were ongoing. From a public policy perspective, it is more than appropriate that State and Federal budgets should contribute in a substantial way to the sediment cleanup. It will not help economically for the local public and private fisc to bear the entire cost of the cleanup effort.

4. The Potentially Liable Parties (PLPs) will have to bear considerable cost, even if insured against this kind of risk – either in increased insurance premiums, or in an inability to be insured against this type of risk in the future. As above, we need help from State and Federal budgets to help lessen local fiscal impacts and opportunity costs for the money spent from local coffers.

5. It is very appropriate for local governments and business entities to expect the same kind of outside financial support, in the same proportion to the overall effort, as other similarly situated communities have. This is not the first such effort undertaken in our state, and it is reasonable for us to think that earlier cleanup efforts in Western Washington have had substantial Federal and State financial support. If the Department of Ecology were to directly contract for some appropriate portion of the cleanup effort – since the contamination resulted from legal activities back in the day – there would be no constitutional issue of such monies going directly to private entity PLPs involved in this cleanup effort.

Port Townsend AirWatchers

It is welcome to finally have cleanup action in sight. However, in agreement with comments submitted by Dr. Peter deFur and others, the proposal offers cleanup alternatives come from standard operating practices of the past and have been shown to be less effective than methods that have been developed and developing over these most recent two decades and are ripe for use here.

In the last couple of decades much research and many trials have allowed for better methods that actually remediate the contaminated areas. Much work has been done, e.g., with fungi (even underwater varieties), and other bio-forms that don't merely accumulate but actually convert the contaminants. I highly encourage the agency to review literature and consult with those who have been developing these methods, including your area's own Batelle Institute and Dr. Paul Stamets at the region's Fungi Perfecti, for instance.

This site would be an ideal proving ground for methods that these and other researchers have been developing and testing, and I submit that whatever of those methods tried, it would likely be much cheaper and more effective.

Of the proposals that are offered:
• Excavation and removal merely moves the problem from one place to another, replicating the contamination in another ecosystem. As they say, in the environment there is no "away" in which to throw things.

• Cover and contain: the contamination is still there. An impermeable cap means that that layer has effectively been killed. It ignores that mobility between soil strata is part of natural soil health.

• Cover and "jump start the natural recovery process" with sand or gravel layers. This one is baffling. Given the litany of chemicals that have accumulated in the Western Port Angeles Harbor sediments, this is a centuries-long process, so "jump start" is a conceptual stretch.

• Check on natural deposition: by itself, equals "do nothing" which is unacceptable as it merely leaves the contaminated mess. Checking on the process regularly should be part of any cleanup process.

A method or methods that actually convert the toxins in situ without killing or removing the natural living living harbor, have ripened for present use and would be much more cost effective and beneficial to the health of the site as a whole. I submit a request that those methods be used instead.

Thank you for your consideration,
Gretchen Brewer

Groven, Connie (ECY)

From: OEC <oec@olympus.net>
Sent: Friday, March 13, 2020 11:00 AM
To: Groven, Connie (ECY); Lawson, Rebecca (ECY); Pendowski, Jim (ECY); Doenges, Rich (ECY)
Subject: OEC correction on western Port Angeles Harbor comments
Attachments: Comments revised final.docx

The date of OEC's comments on the earlier copy read 2002. It should have read 2020. Please make note of this.

I've corrected that on this Word document.

Thank you,

Darlene Schanfald
Olympic Environmental Council
Project Coordinator,
Rayonier Mill-Port Angeles Harbor Hazardous Waste Cleanup Project
PO Box 2664
Sequim WA 98382
1-360-681-7565

Groven, Connie (ECY)

From: OEC <oec@olympus.net>
Sent: Tuesday, March 10, 2020 11:45 AM
To: Groven, Connie (ECY); Lawson, Rebecca (ECY); Pendowski, Jim (ECY); Doenges, Rich (ECY)
Subject: OECC comments on western Harbor Draft RI/FS -- Facility ID 18898-Site Cleanup ID 11907
Attachments: Comments revised final.pdf

PLEASE CONFIRM RECEIPT OF THIS EMAIL

Olympic Environmental Council
PO Box 2664
Sequim WA 98382

Connie Groven
Rebecca Lawson
Jim Pendowski
Rich Doenges
Washington State Department of Ecology
Olympia WA 98504

Attached please find OECC's comments for the western Harbor Draft RI/FS -- Facility ID 18898-Site Cleanup ID 11907.

Darlene Schanfald
Olympic Environmental Council
Project Coordinator,
Rayonier Mill-Port Angeles Harbor Hazardous Waste Cleanup Project
PO Box 2664
Sequim WA 98382
1-360-681-7565

Comments on the Western Harbor Remedial Investigation/Feasibility Study
Prepared for the Olympic Environmental Council Coalition
March 9, 2002
ESC LLC
PL deFur, Ph.D.
Henrico VA

Glossary

aBHC-alpha-Hexachlorocyclobenzene
Dioxins- also TCDDs or tetrachlorodibenzodioxins
IHS- Indicator Hazardous Substances
LEKT- Lower Elwha Klallam Tribe
PAH- polynuclear aromatic hydrocarbons
PCBs-polychlorinated biphenyls
RI/FS-Remedial Investigation / Feasibility Study
RPD- redox potential discontinuity
SCU- Sediment cleanup unit
SMU- Sediment management unit
TEQ- Toxic equivalent

Summary of Comments

Several problems arise with the Remedial Investigation and Feasibility Study (RI/FS) that include the interpretation of data for sediment toxicity and assumptions regarding remedies. These problems are discussed in more detail below in the appropriate sections.

The document portrays a general assumption that on-going sources from the on-land, human made features on the harbor shore cannot and will not be controlled. These sources present contamination problems that are not being addressed at present, according to the RI report on nature and extent of contamination. This approach is unacceptable, especially because these sources are at the harbor and not regional or global in nature.

Executive Summary

The Executive Summary states that the “in-water” dredging will cause release of sediment bound chemicals, but modern techniques and equipment will reduce such releases to a minimal amount, far less than even 10 years ago. Such new techniques include sediment/silt curtains, environmental bucket dredges, suction dredges, and GPS guided dredge heads.

The metals will not breakdown ever; natural recovery is useless for metals**,**
PCBs and especially dioxins that breakdown so slowly and under such conditions as to be not treatable, rendering natural recovery also useless for these compounds.

The RI used all the previous investigations that could be obtained and were conducted during recent investigations of harbor contamination, notably the Rayonier, K Ply, Nippon, among others.

The first 5 sections of the RI/FS report are basic materials that collect summaries of what work has been done previously, a description of the harbor, the well-known information to begin the investigation. The RI/FS itself is intended to provide an analysis of the nature and extent of contamination and the sources. The document then goes on to examine the options for cleaning up the contamination.

Section 1 is an introductory and background description of the harbor area
Section 2 Description of the harbor
Section 3 Historical and Current Uses of the Harbor
Section 4 Previous Investigations
Section 5 RI/FS Activities conducted for this report

Section 6 This part evaluates the results of the investigations to estimate the risks and potential harm to humans and ecological receptors in the harbor, not just the Western Harbor for humans and ecological resources.

Section 6.1.1.1 summarizes the human health risks from eating seafood, evaluating health risks to subsistence fishers, Lower Elwha Klallam Tribe members and recreational users. The section notes: "*Therefore, the preliminary human health IHSs identified included: arsenic, cadmium, copper, selenium, mercury, zinc, alpha-BHC, cPAHs, PCBs, and dioxins/furans TEQ."*

Section 7 presents the nature and extent of the distribution of hazardous substances and wood debris in the Western Harbor.

The introductory points on page 7-0, key findings, suggest that the benthic toxicity is small and of no real concern, while the previous section makes a different conclusion, based on chemical concentrations and wood debris distribution and abundance. Wood debris harms benthic marine habitats and organisms.

Data are primarily from 2008 and 2013, 12 and 7 years ago, respectively. No current data from the past two years is used in this analysis.

Page 7- 7 makes a telling comment that the earlier result of bioassay toxicity tests, using harbor sediments, indicate more widespread toxicity in a much greater number of samples. The reduction in toxicity would indicate improvement in sediment quality, as noted:

- "These improved results primarily reflect use of the resuspension protocol (Kendall et al. 2012) that addressed possible larval entrainment/negative bias, but also may reflect improved sediment quality over the 5-year period between 2008 and 2013."

Section 7.2.4, page 7-7. This section seeks to use the survey information to make the case that benthic habitat is not impacted by chemical contamination or wood debris. The

logic here is faulty and the information and data do not fully support the explanation given as the prime explanation and certainly not as the sole explanation. The successional stage of the benthic assemblage may equally as likely be limited and is not higher due to a depressive impact from chemicals and wood combined.

The document fails to account for the impact of the combined toxicity of both wood debris and the contaminating chemicals, as well as naturally occurring chemicals that exhibit innate toxicity. These two types of contamination act in concert on the benthic assemblage.

Table 7.7 This table gives biological successional stage (the progression from simple to more complex and abundant biological communities), and aRPD (redox potential discontinuity) do not give confidence that natural recovery is working effectively and quickly. The depths for the aRPD are not close to the standard 10cm considered the standard depth for oxidized habitat that supports a healthy benthic community. The 15 years, from 1998 to 2013, shown in the table that elapsed between the two surveys should have been enough time to see greater recovery. And those data are now an additional 7 years out of date/not current. Given the extent and nature of the wood debris, large sizes of the wood debris, there is no evidence that recovery is proceeding at a sufficient pace.

Section 8 presents information on hazard indices and cleanup options

The introduction to the section explains a feature that is an inherent flaw in the analytical system because the toxic chemicals are assessed individually. The toxicity occurs collectively for all the exposures that occur simultaneously, including multiple metals, organic chemicals, and gases (ammonia, sulfurous gases). Failure to evaluate cumulative effects is a major flaw.

Section 8.1.1.1
On page 8.2, the inherent flaw in the analytical system is apparent in how chemicals are dropped from further consideration by assessing individual chemicals according to a single benchmark number. In this case, if a chemical is present at a concentration fractionally less than the screening number (i.e. at 75% of the screening number), and is not carried forward for analysis, and other chemicals have a similar pattern, then all such chemicals are dropped, although the combined, cumulative effects and exposures may well cause harm, or least increase risk. This problem is most serious when the chemical act on a common biological endpoint, such as the nervous system, a sensitive tissue for most, if not all metals. An excellent example is mercury, lead and cadmium, all of which target the developing central nervous system. This inherent flaw is present in the analysis of these data and unfortunately is imbedded in agency procedures and regulation.

Section 8.3.1
Page 8-9 The text admits that land-based sources are not considered in the control or remedial efforts, unlike the situation in CERCLA sites, such as the Lower Duwamish River. In Port Angeles, the remedy does not consider what can and should be implemented to address ongoing sources of contamination. The text does

Section 8.3.2 on page 8-9 and 8-10. This text uses a MTCA provision as an excuse to not clean up on the basis of temporarily displacing natural resources in the harbor. The argument is that cleaning up the contamination will harm the system more than leaving the contaminants in place forever. The metals and PCBs and dioxins/furans will remain in the harbor forever if not removed or treated in place and this section seeks to make the excuse that cleaning up the harbor will cause more harm than good. The flaw in this logic is that the long term harm from leaving contaminating chemicals in place is not toxic forever. These assumptions are false and should be rejected. An analysis will show that the loss of resource use over the next 100 years alone is greater than any short term financial gain to the company.

Section 9.0 Page 9-0 lists bulleted items that are information items from the Remedial Investigation. The last item on the list, the *" determination that wood debris, although widespread, does not pose a toxicity concern within the SCU (sediment cleanup unit)"* is not fully supported by the evidence and, indeed, evidence in the Remedial Investigation contradicts this statement for the following reasons:

1) The sediment toxicity tests do indicate toxicity for this limited battery of tests;
2) The redox potential and thus indication of lack of oxygen, a lethal and biologically limiting condition, is not in the full normal range and the aRPD is not at the depth point to indicate support of a balanced and population of infaunal benthic species;
3) The benthic community successional stage analysis does not indicate that all of the areas with wood debris have the normal and appropriate assemblage of benthic species, especially considering that Puget Sound as a source of larvae and immigration is immediately available, and decades have passed since the input of wood debris has ceased from Rayonier and others, providing time for recovery. Recovery is not occurring at a sufficiently fast pace to conclude "no toxicity." Wood debris is known to produce toxic chemicals (both acute and chronic effects, such as sterol exposure) and these effects must be considered in evaluating wood debris as source materials.

Section 9.2
page 9-6. The last conclusion of this section describes a benthic community that is little impacted by wood debris and the text makes little to no comment about the effects of the combined exposures of wood debris and toxic chemicals. Nor does the section admit or recognize the alternative explanation of the data that the wood debris continues to impair the benthic community and limit growth and recruitment. The alternative interpretation must be given equal credence and credibility, based on the existing evidence.

Section 10. Feasibility Study
This section presents a range of options for addressing the problems of contamination in the area described in the previous sections. One of the options must be the one of doing nothing or also called the "No Action Alternative." This option must describe how risks and conditions can be expected to progress over the coming years if no active cleanup is undertaken. Few methods have been used to address toxic chemicals in sediments: remove, cover up, add something to bind the chemicals or leave it to the system to cover with sediment or wash away. An abundance of evidence from other sites over many years (note the James River, Hudson River, Housatonic River, Columbia River)

demonstrate that PCBs and similar chlorinated organic chemicals will not breakdown, or otherwise leave the system.

The FS also presents the objectives of the cleanup in terms of achieving specific objectives, such as protecting human health from exposure due to consuming contaminated seafood from the harbor. These objectives are presented on Page 10-1.

Section 11 presents information on where the sediment cleanup will take place, the cleanup levels and specifics about sediment remediation. The harbor is divided into three cleanup areas: SMA -1; SMA-2 and SMA -3.

Section 11.2.1 page 11-6 Here the document explains that some areas present logistical restrictions on what work can be conducted in the harbor in terms of cleanup. The major issue is the presence of over-water structures such as docks that cannot be moved and many remain in active use.

The remedy will address sediment cleanup on an area-wide basis so that the areas that cannot be cleaned up are “averaged” with areas that will be cleaned up. This method is standard in approaching this type of sediment cleanup.

Section 12 Remedial Technologies Screening
This section discusses various methods that might be or could be used to cleanup the different parts and contaminated areas.

For the most part, such a presentation is straightforward, but may have a one-sided presentation or a “bias” in terms of limiting applicability of one method or technology.

Page 12-4 for example discusses the limitations of environmental bucket dredges or the sort that have been used in the Lower Duwamish River and in Newark Bay. In the former case, contaminated sediments from an Early Action were removed by an environmental bucket dredge designed and operated for just such a purpose as contaminated sediment removal. And in Newark Bay NJ, the similar situation existed, except that the depth was much greater, up to 50 feet, with an overdredge. The discussion on page 12-4 discounts the option for environmental bucket dredges. This text despite the fact that in at least Newark Bay, if not several other cases, the use of modern technologies and approaches was able to reduce dredge residuals to a mere fraction of other operations and historical residuals.

Section 12.2.4 presents the information on nearshore confined disposal facilities in which the dredged material is placed in a barriered /diked structure that is engineered for such containment. The cleanup at Commencement Bay has such a unit and the community needs to discuss the option of this type of facility in the harbor. At present, the RI/FS does not contemplate such a confined facility, but leaves open the option, should conditions arise.

Section 12.3 explains the general aspects and general methods for an engineered cap to cover sediments that cannot be removed, or are lightly contaminated, or for some other reason must be isolated from the environment.

Section 12.4 This part has some information on treating contaminated sediment in place, referred to as *in situ* treatment. Such treatment is not considered appropriate for metals that do not breakdown, and for some chlorinated organic chemical that have a breakdown so slow as to be imperceptible. A few new technologies are under development or have been used in limited cases for *in situ* treatment, mostly in upland soils. This treatment also includes additives that can bind the chemicals and prevent them from moving into the food web; organic carbon is one such additive and is considered briefly in the feasibility report. Once the chemicals are bound, no additional changes occur.

Section 12.5, page 12-12 and13 presents some material and assessment of Enhanced Monitored Natural Recovery (EMNR), which is a combination of adding a layer or material and then monitoring the situation. This approach, specifically or generally, can work with organic chemicals that breakdown through the action of microbial activity (either natural microbes or added ones). As in the text above for section 12.4, this method does not work with chemicals that do not break down, such as metals and dioxins and some other chlorinated organic chemicals.

Section 12.6, page 12-15. This piece on Monitored Natural Recovery does explain that several different processes are involved in and considered MNR: physical cover, chemical breakdown, and biological digestion. The most toxic chemical contamination problems in Port Angeles Harbor will not be addressed by MNR at all, especially because the natural sedimentation rate is low in the harbor, as explained in this section. MNR for metals and chlorinated organic chemicals that do not breakdown is ineffective.

Section 12.7 Source Control.
The text of the document observes that upland sources should be addressed:
“As stated in the AO, “this Order requires investigation of sediments and identification of ongoing upland sources of contamination that have the potential to result in sediment recontamination at levels greater than prospective sediment cleanup standards. Any such upland sources identified under this Order will be addressed under separate actions, agreements, permits or orders” (State of Washington 2013a).” The problem with the nice sounding language is that the wording does not require that all of the upland sources will be eliminated with certainty.

Section 13 Development of Remedial Alternatives

This section explains and discusses the combination of methods that might be used to clean up the contamination in the three major areas, management areas 1, 2 & 3. The options include maximum removal, medium removal and minimum removal for the three major sediment management areas (SMAs).

One of the alternatives for each area includes no removal of sediment and instead reliance on natural recovery of some description.

One notable aspect of this section is that the FS includes and proposes no action for the largest area, SMA 3. The explanation for no active remediation for the majority of the harbor is that active remediation is too difficult and too expensive.

Section 14 Alternatives
All of the alternatives were evaluated according to a series of criteria:

1- Protectiveness
2- Permanence
3- Long term effectiveness
4- Short term risk
5- Technical and administrative issues
6- Consideration of community public concerns

The final selections for cleanup are presented in this section, specifically, the RI/FS identifies the following alternatives as the preferred ones for the three sediment management areas:

Alternative 1-D: Partial Intertidal Excavation and Capping with Subtidal Capping for SMA 1;
Alternative 2-E: Intertidal Capping with Subtidal EMNR for SMA 2;
Alternative 3-B: Year 10 EMNR with MNR for SMA 3.

These options do not present the most effective long term options. The better options maximize removal of the contaminants from the intertidal zone in SMA 1 intertidal areas, with subtidal removal.
In SMA 2, the better option is intertidal removal with some subtidal removal and EMNR.
And in SMA 3, the option should include removal and EMNR, with limited MNR.

Summary
In summary, the FS assumes that the benefit of a cleaner harbor, which accrues to the entire community is not great enough to balance against the cost to the companies responsible for the cleanup. As a result, the FS proposes to leave more contamination in place than alternatives that can remove more contamination. The alternatives with maximum removal will provide much better long term, permanent protection and will be more cost effective for the Port Angeles community.

• Cumulative effects of all contaminants simultaneously need to be considered
• The on-going and land based sources, both soil-based and water-based, must be controlled by requirement and with certainty
• The most recent data are 5 years old and must be updated before a decision is finalized
• The most up to date methods are not included (removal methods used in the US) and the FS is incomplete without these methods
• The impacts of woody debris are far greater than noted in the RI/FS.

Groven, Connie (ECY)

From: Matt Beirne <matt.beirne@Elwha.org>
Sent: Monday, March 16, 2020 4:53 PM
To: Groven, Connie (ECY)
Subject: LEKT Comments on WPAH Public Review Draft RIFS_F
Attachments: LEKT Comments on WPAH Public Review Draft RIFS_F.docx

Hi Connie,

Please find our attached comments regarding the WPAH Public Review Draft RIFS. If you have any questions, feel free to give me a call.

Thanks!

Matt

Matt Beirne
Natural Resources Director
Lower Elwha Klallam Tribe
760 Stratton Road
Port Angeles, WA 98363
360-457-4012, ext 7480
360-461-2516 cell

Lower Elwha Klallam Tribe's Additional Comments
on the Western Port Angeles Harbor Sediment Cleanup Unit
2019 Public Review Draft Remedial Investigation/Feasibility Study

March 16, 2020

The Lower Elwha Klallam Tribe ("Lower Elwha" or "the Tribe") has previously, in 2018 and 2019, submitted review comments to the Department of Ecology on prior review drafts of the Western Port Angeles Harbor Sediment Cleanup Unit Remedial Investigation/Feasibility Study (RI/FS). While the Tribe found most responses to our comments to be adequate and believes that the Western Port Angeles Harbor Group's (WPAHG) revisions the RI/FS report reasonably address some of the Tribe's comments, we continue to note several concerns that Ecology must consider in developing the Cleanup Action Plan for the Site.

Additional Characterization

The Tribe supports additional characterization during the pre-remedial design phase to include characterization of intertidal areas within the lagoon (SMA-2) and within proposed buffer areas surrounding and beneath overwater structures and in other nearshore areas (SMA-1 and SMA-3). The potential for disturbance in these areas to re-suspend sediments and re-contaminate adjacent remediated areas should be evaluated and addressed. Potential contamination in these areas must be considered and addressed when determining compliance with cleanup levels based on surface-weighted averaging.

According to the Draft RI/FS there are a number of historical industrial outfalls located in the inner harbor and the lagoon. It appears that these shoreline locations were not sampled during the remedial investigation. We recommend collecting sediment grab and core samples from these intertidal areas during the pre-remedial sampling design.

In addition to the historic industrial outfall locations, there appears to be a sampling gap along the northwestern shoreline from the Tesoro leased pier to the east. This area appears to have greater composition of fines and is located near significant historical industrial activities.

Sediment Management Area (SMA) 2

As noted in our previous comments, the Tribe believes that a full dredging or partial dredging and capping option is necessary rather than capping only or EMNR options. While a revised alternative (Alternative 2-D) provides a new option that focuses on intertidal and shallow subtidal excavation and capping actions in the lagoon to minimize changes to ecological conditions in this area, it is not included in the preferred alternative. The Tribe continues to strongly prefer excavation or partial excavation and capping in the lagoon, as opposed to capping and EMNR only.

Transloading Facility

The Tribe anticipates that extended activities at the proposed transloading facility may have significant impacts on Tribal uses and resources at the adjacent Tse-Whit-Zen village site. WPAHG should be on notice to consult with the Lower Elwha Tribe and develop culturally appropriate mitigation for these potential impacts. In addition to options for shielding to minimize noise and dust impacts, compensatory mitigation may also include additional ecological restoration actions at the lagoon.

Filling of Intertidal Habitat

The selected alternative should not rely on filling of intertidal areas that would result in the loss of the amount or quality of intertidal habitat.

Compliance with MTCA and SMS Requirements

Alternatives that do not comply with the requirements of the Model Toxics Control Act (MTCA) or the Sediment Management Standards (SMS) should not be included in the RI/FS. Retaining such alternatives is misleading and gives the appearance that the alternative preferred by the proponent provides greater protection than an alternative that doesn't even meet MTCA and SMS standards.

Treaty Rights and Access

The RI/FS notes that institutional controls would be detailed as appropriate in an OMMP to be developed and refined during remedial design "ensuring that such controls minimize the potential to impact the exercise of Tribal treaty rights." This sentence should be modified to add the phrase "including tribal access to treaty resources." In addition, it should be expressly noted that institutional controls that have the potential to impact the exercise of Tribal treaty rights should be developed in consultation with Lower Elwha and the S'Klallam Tribes.

Clallam County Board of Commissioners

See attached letter for comments from the Clallam County Board of Commissioners.

Loni Gores - Clerk
agores@co.clallam.wa.us
360-417-2256

Board of Clallam County Commissioners

223 East 4th Street, Suite 4
Port Angeles, WA 98362-3015
360.417.2233 Fax: 360.417.2493
Email: commissioners@co.clallam.wa.us

March 3, 2020

Department of Ecology
Connie Groven
Cleanup Project Manager
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Re: Port Angeles Harbor Cleanup Site Cleanup ID 11907

Dear Ms. Groven:

We appreciate the scientific work and information your department has developed for cleanup alternatives in the Western Port Angeles Harbor after over a decade of study.

After the Department of Ecology thoroughly investigated the alternatives in collaboration with the five public and private entities, we believe the science based protective remedy recommended is cost effective, can be implemented on a timely basis, and meets the Model Toxics Control Act. We recognize that this information and recommendation was the result of hard work over many years. One of the very important factors in your preferred remedy is the fact that there are case studies showing that your recommendation has been successful in other locations.

The preferred cleanup remedy includes intertidal excavation, intertidal capping, and subtidal enhanced monitoring. This combination of remedies when coupled with compliance monitoring and institutional controls (we believe) will result in a successful outcome. This remedy is comprehensive, and includes protections for ecological and cultural resources during construction to protect salmon and shellfish habitat. In addition, you have recognized that this project will be taking place in a working harbor, and your recognition of this fact will help to sustain water based operations during the cleanup period.

Thank you for accepting our comments, and we appreciate the Department of Ecology's proactive stance on this very important project.

Sincerely,

BOARD OF CLALLAM COUNTY COMMISSIONERS

Excused absence
Mark Ozias, Chair

Randy Johnson

Bill Peach