

**DRAFT ENVIRONMENTAL IMPACT STATEMENT
SR 520 BRIDGE REPLACEMENT AND HOV PROGRAM**

MAY 2010

SR 520 Pontoon Construction Project

Hazardous Materials Technical Memorandum



THE INFORMATION IN THIS REPORT IS ACCURATE; HOWEVER, THE PONTOON CONSTRUCTION PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT IS THE SOURCE OF THE MOST CURRENT PROJECT INFORMATION AND ANALYSIS.

SR 520 Pontoon Construction Project Draft Environmental Impact Statement

Hazardous Materials Technical Memorandum

Prepared for

**Washington State Department of Transportation
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Abbreviations and Acronyms

ALY	Anderson Log Yard
ASTM	American Society for Testing and Materials
bgs	below ground surface
BMP	best management practice
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CTC	Concrete Technology Corporation
CUL	clean-up level
CWA	Clean Water Act
DDT	dichlorodiphenyltrichloroethane
DMMO	Dredge Material Management Office
DMMP	Dredge Material Management Program
Ecology	Washington State Department of Ecology
EDR	Environmental Data Resources, Inc.
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment <i>or</i> Endangered Species Act
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act of 1972
FINDS	Facility Index System
FTTS	FIFRA/TSCA Tracking System
GHLC	Grays Harbor Lumber Company
HOV	High-Occupancy Vehicle
HRM	Highway Runoff Manual
HWMA	Hazardous Waste Management Act
I-5	Interstate 5
ICR	independent cleanup report
ID	identification
IDD #1	Port of Grays Harbor Industrial Development District #1
LEL	lower explosive limit
LUST	leaking underground storage tank
mg/kg	milligrams per kilogram

MLLW	mean lower low water
MTCA	Model Toxics Control Act
NFA	No Further Action
NFRAP	No Further Remedial Action Planned
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Act
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RCW	Revised Code of Washington
REC	recognized environmental condition
SDWA	Safe Drinking Water Act
SPCC	Spill Prevention, Control, and Countermeasures
SR	State Route
SWMA	Solid Waste Management Act
SWQS	Surface Water Quality Standards
TPH	total petroleum hydrocarbon
TSCA	Toxic Substances Control Act
USC	United States Code
USGS	U.S. Geological Survey
UST	underground storage tank
VOC	volatile organic compound
WAC	Washington Administrative Code
WPCA	Water Pollution Control Act
WSDOT	Washington State Department of Transportation

1. Introduction

This report identifies areas near or within the State Route (SR) 520 Pontoon Construction Project hazardous materials study areas that contain, or have the potential to contain, hazardous materials, hazardous wastes, or contaminated environmental media such as soil, groundwater, sediment, or surface water.

Why are hazardous materials considered in an EIS?

Hazardous materials; hazardous substances; solid, hazardous, or dangerous waste; and contaminated environmental media are considered in an environmental impact statement (EIS) to assess their effects on the proposed project. The concern is that a release or threat of release of contaminants during or after construction of the project could harm human health or the environment. Identification and evaluation of possible effects during the EIS process allows mitigation measures to be identified. Measures might include changes in the project alignment (avoidance), identification of areas that require additional investigation before property acquisition, and implementation of other measures that are protective and reduce environmental liability and associated costs.

What are the key points of this technical memorandum?

The Washington State Department of Transportation (WSDOT) proposes building a casting basin facility at one of two alternative sites in the Grays Harbor area to manufacture large concrete floating bridge pontoons. These pontoons would be built to replace the floating portion of the Evergreen Point Bridge in the event of a catastrophic failure, or to support the planned replacement of the bridge. The Concrete Technology Corporation, Inc. (CTC) operates an existing casting basin facility in Tacoma; WSDOT might use CTC for the project, primarily to build smaller pontoons while the Grays Harbor casting basin is being built. The completed pontoons would be moored at approved locations in Grays Harbor and in Puget Sound until needed. Because the CTC facility is currently in use and its casting basins have been previously used by WSDOT for the same purposes, no additional hazardous effects or mitigation measures are anticipated.

What are hazardous materials?

These are materials that are in use that are toxic or harmful to human health or the environment and are regulated under federal CAA, CWA, TSCA, or RCRA regulations. Examples include asbestos, lead-based paint, and toxic chemicals such as PCBs.

What are hazardous substances?

Materials that are in use that may be toxic or harmful to the environment, but are not regulated by the rules cited above. Examples include petroleum products such as gasoline, diesel, and oils.

What is solid waste?

Discarded materials include solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, and household activities. Excluded are domestic sewage, industrial discharges, and nuclear materials.

What is hazardous or dangerous waste?

Solid wastes that are toxic or harmful are regulated by federal RCRA and state Dangerous Waste regulations. These wastes include those that are characteristically reactive, corrosive, toxic, or ignitable as well as specified "listed" wastes.

What are contaminated media?

Contaminated media are soil, sediment, groundwater, surface water, or air that has been contaminated by a release of a hazardous material, hazardous or dangerous waste, or hazardous substance. These may be regulated under federal CERCLA, RCRA, or state MTCA regulations.

The principal effects associated with hazardous materials at the proposed Grays Harbor Pontoon Construction Alternative sites include potential release of contaminated water into surface water bodies, alteration of existing contaminant migration pathways, accidental spills, potentially contaminated sediment requiring upland disposal, and worker safety and public health issues.

Sites in the study area have been placed into two risk categories: low- to moderate-impact sites and high-impact sites. Five low- to moderate-impact hazardous material sites have been identified in the two study areas (including the two Grays Harbor Alternative sites). Based on available site information, none of the low- to moderate-impact sites has the potential to affect project construction. No high-impact sites have been identified in the study area.

A Phase II Environmental Site Assessment (ESA) (February 2009) and a supplemental groundwater investigation (November 2009) were completed at both Grays Harbor Alternative sites (Attachment A). A supplemental soil investigation was also completed at the Aberdeen Log Yard Property (November 2009). Wide-spread soil and groundwater contamination were not identified although localized areas of contamination exist at both sites due to the sites historic use as a sawmill.

A reconnaissance-level sediment sampling event conducted in February 2009 from within the launch channel at each of the respective sites indicated that dredged sediments at the Anderson & Middleton Alternative site may be suitable for unconfined open-water disposal. Some of the dredged sediments from the Aberdeen Log Yard Alternative site may require upland disposal at a non-hazardous-waste landfill as a result of low-levels of contaminants. Additional testing following the U.S. Army Corps of Engineers' Dredged Material Management Program (DMMP) procedure will be required to confirm these findings.

Following are possible mitigation measures for the identified effects:

- Conduct additional studies to determine the need to provide treatment for groundwater generated during dewatering activities
- Conduct additional sediment studies to determine if sediment excavated from the pontoon launch channel will require special handling and upland disposal
- Prepare a comprehensive contingency and hazardous substances management plan, a worker health and safety plan, a spill prevention control and countermeasures plan, and a storm water pollution prevention plan
- Provide appropriate water treatment facilities prior to discharge to surface water

What is a low-to-moderate impact?

This risk level identifies sites where potential contamination is known or where it can be reasonably predicted. These sites are typically small to medium in size, contaminants are not extremely toxic or difficult to treat, and remediation options are straightforward.

What is a high impact?

This risk level identifies sites that may be substantially contaminated and will create a major liability for WSDOT. These sites usually have large volumes of contaminated soil, groundwater, or sediment and have complex types of contaminants that require special handling requiring disposal that is expensive to manage.

- When encountered, manage and dispose of localized hazardous or contaminated materials in accordance with applicable requirements
- When encountered, use construction techniques that minimize disturbance or release of localized contaminated media

No unavoidable negative effects relating to hazardous materials and no unavoidable negative effects on the environment or human health due to contamination are expected as a result of construction or operation of the project. Future cleanup liability as a result of acquiring the sites is considered to be low.

What are the project alternatives?

The Pontoon Construction Project Draft EIS evaluates two build alternatives that would involve constructing a new casting basin in Grays Harbor and one No Build Alternative. Two waterfront sites in the Grays Harbor area are being evaluated for the new casting basin facility:

- Anderson & Middleton property in Hoquiam
- Aberdeen Log Yard property in Aberdeen

The new Grays Harbor casting basin facility could produce all 33 pontoons needed for this project: 21 longitudinal pontoons (360 feet long by 75 feet wide), 10 supplemental stability pontoons (98 feet long by 60 feet wide), and 2 cross pontoons (240 feet long by 75 feet wide). To expedite

pontoon construction, however, each build alternative could include using the existing CTC casting basin facility in Tacoma to build pontoons while the new casting basin facility at Grays Harbor is being constructed. If used, the CTC facility, which has a limited operations area, could build up to three longitudinal pontoons and up to ten supplemental stability pontoons.

WSDOT would float most of the completed pontoons built at the new casting basin facility out of the casting basin and tow them to one or more moorage locations in the Grays Harbor area. The last pontoons built would be stored in the casting basin until needed. Any pontoons constructed at the CTC facility would be moored at existing marine berths in Puget Sound.

After the project is completed, the new casting basin would be available to produce additional pontoons needed for the planned Evergreen Point Bridge replacement, a component of the Interstate 5 (I-5) to Medina: Bridge Replacement and High-Occupancy Vehicle (HOV) Project. Pontoons for other WSDOT bridge replacement projects in the future could also be produced at this facility.

Each alternative is described below. For more details, see the Description of Alternatives and Construction Techniques Discipline Report (WSDOT 2009a), included as Attachment B to the Draft EIS.

What is a casting basin facility?

Pontoons for this project would be built at a casting basin facility. The facility would consist of a casting basin (a large chamber in which pontoons are constructed, see the next text box for a more thorough description) and several supporting facilities, such as a batch plant to produce concrete, access roads, storage and laydown areas, office space for workers, and water treatment facilities.

Site Descriptions

Anderson & Middleton Alternative

The 105-acre Anderson & Middleton Alternative site is on the north shore of Grays Harbor in Hoquiam, Washington (Exhibit 1). This generally flat property is privately owned and is zoned for industrial use. The site is surrounded by industrial maintenance shop buildings to the west, railroad tracks to the north, and vacant industrial property to the east; a rock berm borders the shoreline. The Anderson & Middleton site has no structures on it except for an existing small office building on the northern edge of the property. The site also has some gravel roads and an asphalt pad remaining from its former use as a log sorting yard. WSDOT would purchase 95 acres of this site for the project, and the casting basin and support facilities would occupy the eastern half of the site, amounting to approximately 55 acres.

Historically this site has been used for lumber industry activities. In the early twentieth century there was a sawmill and other related facilities, such as machine shops and burners, west of what was then an extension of 8th Street. Over the next several decades, fill from harbor dredging and refuse accumulation increased the land area of the site. By the late 1960s, the former mill structures were all gone. Since then, the site has been used for timber storage.

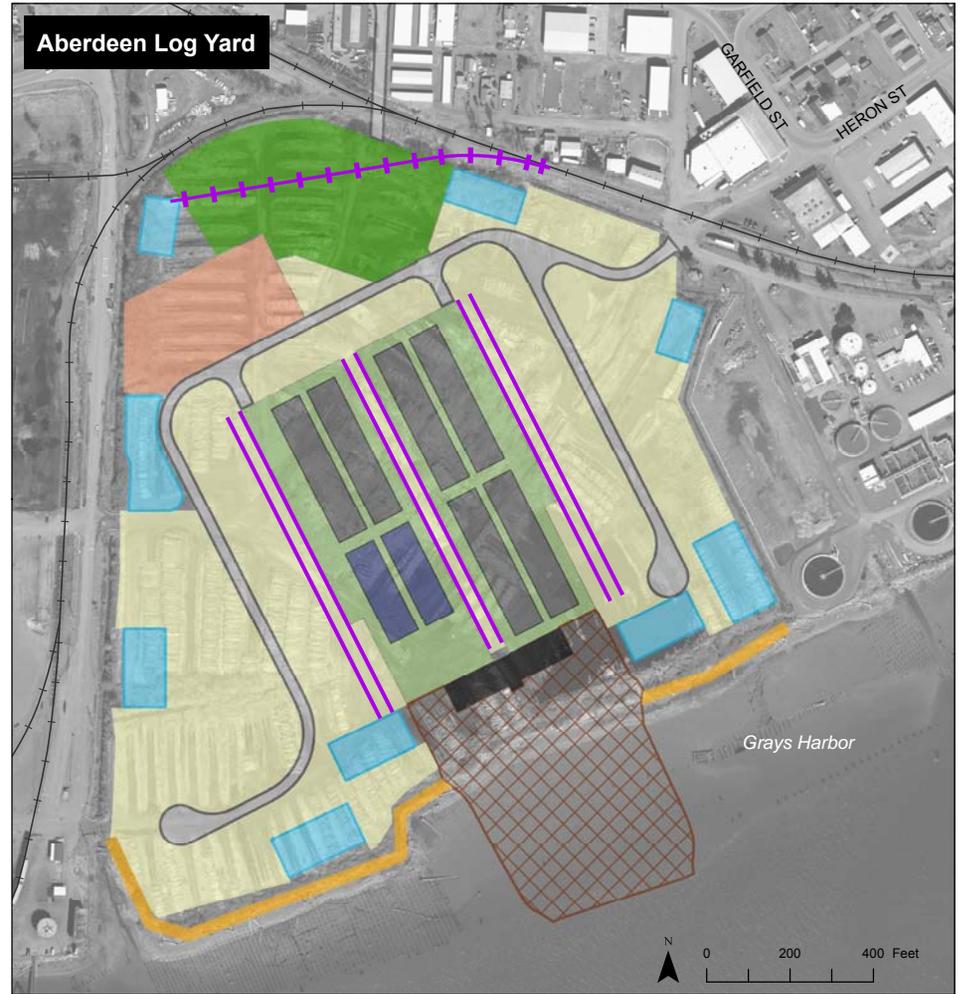
Aberdeen Log Yard Alternative

The 51-acre Aberdeen Log Yard Alternative site lies on the north shore of Grays Harbor in Aberdeen, Washington, near the mouth of the Chehalis River (Exhibit 1). This generally flat site is zoned industrial and is currently owned and used for log storage by Weyerhaeuser Corporation. There are no structures on the site now but there is a system of unpaved access roads connecting to East Terminal Road to the west and State Street to the northeast. Immediately west of the site is paved Port of Grays Harbor industrially zoned property, the City of Aberdeen wastewater treatment plant borders the eastern boundary, and the Puget Sound & Pacific Railroad mainline and siding run along the northern boundary of the site. WSDOT would purchase all 51 acres, and the casting basin and support facilities would occupy the entire site.

Two sawmills operated on the site in the last century, but since 1971, the site has been used mostly for log storage. All former sawmill-related structures have been demolished. Between 1971 and 1981, the shoreline was extended to the south through backfilling with sediments dredged from the Chehalis River, accumulated wood waste, and other fill material.

No Build Alternative

For the Pontoon Construction Project, the No Build Alternative is continued existing conditions and uses at all proposed alternative sites. Specifically, this means that WSDOT would not construct or store any pontoons—either at a new Grays Harbor facility or at the existing Tacoma CTC facility—needed to respond to a catastrophic failure of the Evergreen Point Bridge. As a result, any environmental effects resulting from the proposed project activities would not occur.



- Crane rail
- Proposed rail spur
- Existing railroad
- CTC facility limits
- Cross pontoon
- Longitudinal pontoon
- Water treatment area
- Access road
- Batch plant
- Berm
- Casting basin
- Dry storage and laydown area
- Gate
- Launch channel
- Office and parking

Source: WSDOT (2005, 2006) Aerial Photo, USDA-FSA (2006) Aerial Photo, Grays Harbor County (2006) GIS Data (Roads), Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for layers is NAVD88.

Exhibit 1. Locations and Conceptual Layouts for Build Alternative Sites

Pontoon Construction Project



For this Draft EIS, WSDOT assumes that, if unused by this project, the alternative site properties would continue to be used as they are today: the Aberdeen Log Yard would remain an active log yard, the Anderson & Middleton site would remain largely inactive, and the CTC site would be used as a casting basin for other projects and clients. While either Grays Harbor site could be developed for new uses should this project not occur, the use of these properties has remained unchanged since the 1990s. Potential future uses for these two properties, other than our proposed project, are speculative and therefore not considered under the No Build Alternative.

Key Components of Both Build Alternatives

Both build alternatives would carry out the proposed action by using the existing casting basin at the CTC facility in Tacoma while simultaneously constructing a larger casting basin in the Grays Harbor area where more pontoons could be produced in a shorter time frame.

Potential Use of the Existing CTC Casting Basin Facility

The existing CTC facility is adjacent to the Blair Waterway on the eastern edge of Commencement Bay in Tacoma (Exhibit 1). This casting basin is too small to accommodate the timely construction of the pontoons required for the Pontoon Construction Project, but WSDOT could use this facility to supplement pontoon construction at the larger casting basin proposed in the Grays Harbor area. The pontoons manufactured at the CTC facility would most likely be the smaller supplemental stability pontoons.

WSDOT would moor the pontoons built at the CTC facility at existing marine berths in Puget Sound, subject to availability.

What is a casting basin?

A casting basin is a construction facility built next to a navigable waterway that consists of a concrete slab built deep below ground level and surrounded by high concrete walls. The interior area of the casting basin provides a flat dry space where several pontoons can be constructed side by side at the same time. After the pontoons are completed, the basin is flooded. The basin walls contain the flood water, allowing the pontoons to float. When the pontoons are floating, a gate is opened and the pontoons are towed from the casting basin into navigable waters.

Proposed Grays Harbor Casting Basin

The design of the proposed Grays Harbor casting basin would be basically the same at both build alternative sites, with variations depending on site-specific features. (See the Description of Alternatives and Construction Techniques Discipline Report [WSDOT 2009a] for information on the casting basin conceptual design.) The casting basin would be positioned a few hundred feet from the shoreline and partitioned into two separate work areas—called chambers—connected to the water by a single launch channel. The launch channel would consist of an onshore portion excavated between the casting basin and shoreline, a breach in the shoreline berm, and a dredged channel extending offshore to the federal navigation channel in Grays Harbor.

Up to four concrete pontoons could be cast and cured in each of the two chambers of the partitioned casting basin, allowing pontoon construction to be phased for efficiency. That is, while the second chamber is under construction, pontoon construction could be initiated in the first partitioned chamber as soon it was completed. Two reinforced floating concrete gates

leading to each chamber would allow each to be independently flooded and drained, as well as control access to the launch channel.

Constructing a casting basin facility at either Grays Harbor build alternative site would require heavy construction activities to transform the vacant land into an industrial facility. Such activities include, but would not be limited to, the following:

- Grading (leveling) the site and excavating the casting basin
- Pile-driving to install support piles for the casting basin floor
- Paving onsite access roads
- Making multiple truck trips for hauling materials to and from the site
- Dewatering the soils during casting basin construction

All stormwater, process water, and groundwater collected onsite would be handled and treated in accordance with state water quality requirements and discharged to Grays Harbor. Project engineers are designing a water supply, distribution, and treatment system for each site to meet state standards.

Dewatering

WSDOT would install two different dewatering systems to remove groundwater from the casting basin work area at either build alternative site. Before and during casting basin construction, a temporary construction dewatering system would operate at the site. During pontoon-building operations and after the Pontoon Construction Project is completed (but while the site is still maintained by WSDOT), a permanent operation dewatering system would operate.

Operational Support Facilities

To support the use of the casting basin, each build alternative would include onsite operational support facilities such as an access road, a concrete batch plant, large laydown areas, water handling and treatment areas, office space, a rail spur, and a designated parking area for workers.

Pontoon Towing and Moorage

If WSDOT uses the existing CTC facility in Tacoma, it would moor the pontoons built there at existing marine berths in Puget Sound. Using these berths would be subject to availability, but there are several locations in the Puget Sound region that could accommodate this project's needs. The first two cycles of eight pontoons manufactured at the new Grays Harbor casting basin facility would be towed from the casting basin and moored in the Grays Harbor area outside of navigation channels. The last construction cycle of pontoons could be stored in the dry casting basin behind the closed gate.

For the pontoons to be moored in the Grays Harbor area, there are several existing berths that WSDOT could lease for pontoon moorage, if available when needed. In addition, WSDOT has identified three other potential moorage locations: (1) open water moorage in outer Grays Harbor; (2) nearshore moorage in inner Grays Harbor; and (3) dock moorage in the Chehalis

River. Please see the Description of Alternatives and Construction Techniques Discipline Report (WSDOT 2009a) for more information on these potential moorage locations.

The constructed pontoons would be stored together until they are needed to replace the Evergreen Point Bridge in the event of a catastrophic failure, and they would be identified with navigation lighting in compliance with U.S. Coast Guard requirements.

Construction Schedule

If WSDOT uses the existing CTC facility, pontoon construction would take 2 years there to complete. WSDOT would start site development for the Grays Harbor new casting basin facility at about the same time as starting pontoon construction at the CTC facility. For the Grays Harbor facility, casting basin construction would take 2 years, as would pontoon construction. In total, overall pontoon project construction would span 4 years.

WSDOT anticipates that it would take approximately 6 to 9 months to complete a pontoon construction cycle at either the existing Tacoma facility or at the new Grays Harbor facility. The new Grays Harbor facility could produce eight pontoons during one cycle; as a result, two and a half pontoon construction cycles would be required to produce 20 pontoons. At the existing CTC facility, five supplemental stability pontoons could be constructed during each pontoon construction cycle, and one longitudinal pontoon could be constructed during a cycle. As a result, three construction cycles would be needed to produce ten supplemental stability pontoons and one longitudinal pontoon.

What are the regulatory considerations and applicable laws?

Hazardous materials are defined and regulated by federal, state, and local agencies. They are identified and regulated at the federal level by the U.S. Environmental Protection Agency (EPA). For properties located within the boundaries of the state of Washington, the EPA has delegated implementation of the federal hazardous materials regulations to the Washington State Department of Ecology (Ecology). Even though EPA has delegated these responsibilities to Ecology, EPA maintains final authority on regulating hazardous materials. Therefore, the project site is subject to both federal and state regulations. Attachment A provides more detail on this topic.

Applicable federal and state regulations controlling the use, storage, handling, and disposal of hazardous materials in Washington include the following:

Federal

- Clean Air Act (CAA), 42 United States Code (USC) 7401 et seq.
- Clean Water Act (CWA), 33 USC 1251 et seq.
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601 et seq.
- Endangered Species Act (ESA), 7 USC 134, 16 USC 460 et seq.

- Federal Highway Administration (FHWA), Technical Advisory T6640.8A (1987), *Supplementary Hazardous Waste Guidance* (1997), and *Hazardous Wastes in Highway Rights-of-Way* (1994)
- Occupational Safety and Health Act (OSHA), 29 USC 651 et seq.
- Resource Conservation and Recovery Act (RCRA), 42 USC 321 et seq.
- Safe Drinking Water Act (SDWA), 42 USC 300(f) et seq.
- Small Business Liability Relief and Brownfields Revitalization Act
- Toxic Substances Control Act (TSCA), 15 USC 2601 et seq.

Washington State

- CAA, Chapter 70.94 Revised Code of Washington (RCW)
- Hazardous Waste Management Act (HWMA), Chapter 70.105 RCW
- Model Toxics Control Act (MTCA), Chapter 70.105D RCW
- Occupation Health Standards, Washington Administrative Code (WAC) 296-62
- Solid Waste Management Act (SWMA), Chapter 70.95 RCW
- Underground Storage Tanks (USTs), Chapter 90.76 RCW
- Water Pollution Control Act (WPCA), Chapter 90.48 RCW

What was the methodology used in preparation of this report?

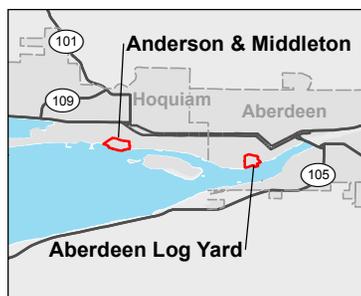
The hazardous materials discipline team obtained information on potential or existing conditions as well as relevant historical conditions within the project study area. The study area for the hazardous materials analysis, shown on Exhibit 2, includes the proposed build alternative sites as well as an area up to 1 mile from the center of these sites in accordance with American Society for Testing and Materials (ASTM) search radius guidance (ASTM E 1527), as referenced in the WSDOT Environmental Procedures Manual (WSDOT 2008a). This technical memorandum has also been prepared following the Guidance and Standard Methodology for WSDOT Hazardous Materials Discipline Reports (WSDOT 2009b).

Since the CTC facility is currently in use and its casting basins have been previously used by WSDOT for the same purposes, no additional hazardous effects or mitigation measures are expected. Therefore, no additional hazardous materials analyses were performed for the CTC facility.

The previous studies conducted, research methodology, and site screening methods for the Grays Harbor sites are presented below.

Previous Studies

A modified Phase I ESA for the Anderson & Middleton Alternative site was prepared by WSDOT in 2006. A hazardous materials screening report for the Aberdeen Log Yard



- Listed site in study area
- 1-mile buffer
- Build Alternative Site
- City limits



Source: Environmental Data Resources (2008) GIS Data (Listed Site), Grays Harbor County (2006) GIS Data (Waterbody and Street), Grays Harbor (2007) GIS Data (City Limits). Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for layers is NAVD88.

Exhibit 2. Study Area and Listed Sites

Pontoon Construction Project



**Washington State
Department of Transportation**

Alternative site was prepared for WSDOT in 2008 (CH2M HILL 2008). In addition, a Phase II ESA (CH2M HILL 2009), a sediment characterization report (WSDOT 2009c), and a supplemental soil and groundwater investigation (WSDOT 2009d), were prepared in 2009 for both the Anderson & Middleton and Aberdeen Log Yard sites. (The main texts of these reports are provided as Attachment A, Attachment B, and Attachment C, respectively, to this technical memorandum.) The Phase I ESA, the hazardous materials screening report, the Phase II ESA, the sediment characterization report, and the supplemental soil and groundwater report included most of the study elements required for this technical memorandum. As a result, the findings of these previous investigations have been incorporated into the affected environment section of this technical memorandum.

Research Methodology

Regulatory Database

Methodology used to evaluate hazardous materials included reviewing local, state, and federal regulatory databases to identify potential contamination sources within 1 mile of the property centerline. Information on sites with known or suspected environmental concerns within the project vicinity was also obtained from Environmental Data Resources, Inc. (EDR), a commercial database service that searches EPA and Ecology databases. This 2008 EDR database search report is included as a compact disc in Attachment D.

Regulatory File Review

Site file information was reviewed in previous reports or reviewed by the team at the Ecology Southwest Regional Office and the Washington State Archives Office because environmental conditions at the selected sites are more likely to result in possible effects on the project. Files were not available for all sites. Each file was reviewed for enforcement action in the last 5 years, confirmed or suspected contaminated media and associated contaminants, depth to groundwater and flow direction, and cleanup status.

Historic Information

The hazardous materials analysts reviewed historical information sources (topographic maps, aerial photographs, Sanborn maps) to identify past uses and activities on sites located within and adjacent to project limits. The U.S. Geological Survey (USGS) 7.5-minute series Hoquiam and Aberdeen, Washington, quadrangle topographic maps were reviewed for the years 1947, 1957, 1973, 1983, and 1994. Historical aerial photographs reviewed were provided by the WSDOT Aerial Photo Lab of the Anderson & Middleton Alternative site for 1966, 1978, 1988, 1993, and 2003, and several oblique photographs with unknown dates (Landau Associates 2006). Aerial photographs of the Aberdeen Log Yard Alternative site were provided by EDR for 1971, 1981, 1994, and 2006, and several undated, oblique photographs (Landau Associates 2006). Historical Sanborn maps, detailed city plans focusing on commercial and industrial areas, from EDR for the Anderson & Middleton Alternative site were reviewed for the years 1902, 1907, 1916, 1928, 1948, and 1969 (WSDOT 2006). Historical Sanborn maps received from EDR for the Aberdeen Log Yard site were reviewed for the years 1906, 1914, 1928, 1948, and 1989.

Visual Site Reconnaissance

A visual site reconnaissance was conducted for each site. The purpose of this site reconnaissance was to observe current site conditions and to identify visible indications of hazardous or potentially hazardous substances historically or currently used, generated, stored, or disposed of within the study area. The Anderson & Middleton Alternative site reconnaissance was performed on November 11, 2008. The property owner was not present.

On September 25, 2008, the team conducted a site reconnaissance of the Aberdeen Log Yard Alternative site. Other members of the WSDOT SR 520 project team were present during the reconnaissance. Mr. Dennis Davies, Senior Environmental Engineer from Weyerhaeuser, led the site reconnaissance. Because some areas of the property were overgrown with vegetation and inaccessible, not all parts of the site were directly observed.

Previous Site Investigations

In 2006, WSDOT conducted a modified Phase I ESA to identify any RECs associated with three of the five parcels at the address of the Anderson & Middleton Alternative site (056400600202, 056400600201, and 056400700200). The modified Phase I ESA did not include interviews with the property owner or a site reconnaissance.

File information on the Aberdeen Log Yard Alternative site was provided by the current property owner and was reviewed for this assessment. Selected documents are summarized below. This discussion is not intended to be a complete summary of past or current facility compliance with environmental regulations, but rather is a cursory review to identify possible RECs at the site.

Interviews

An interview with the owner of the Anderson & Middleton Lumber Company, Mr. James Middleton, was conducted by CH2M HILL on January 9, 2009. WSDOT interviewed Hoquiam Fire Department Chief Ray Pumphrey in 2006.

On September 25, 2008, Mr. Dennis Davies, Senior Environmental Engineer, Weyerhaeuser Company, was interviewed during a site visit by CH2M HILL staff regarding the Aberdeen Log Yard property's history and environmental conditions. Weyerhaeuser was using the property for log bucking and log storage.

Site Screening Criteria

An initial screening process was performed to narrow the long list of identified sites into a subset list of sites identified for further investigation. Sites eliminated from further evaluation during the initial screening process pose little to no risk to the project because the site was listed only on the RCRIS (Small and Large Quantity Generators), Facility Index System (FINDS), and/or EPA Federal Insecticide, Fungicide and Rodenticide Act of 1972 (FIFRA)/TSCA Tracking System (FTTS) databases. These database listings indicate that the site generates or uses hazardous materials that are regulated, but that no soil or groundwater contamination exists at the site. When the subset lists of sites are determined, the remaining sites are placed into one of two risk categories: low- to moderate-impact sites or high impact

sites. Low to moderate impact sites are those sites where potential contamination is known or where it can be reasonably predicted. These sites are typically small to medium in size, contaminants are not extremely toxic or difficult to treat, and remediation options are straightforward. High impact sites may be substantially contaminated and would create a major liability for WSDOT. These sites usually have large volumes of contaminated soil, groundwater, or sediment and have complex types of contaminants that require special handling requiring disposal that is expensive to manage (WSDOT 2009b).

Anderson & Middleton

Twenty-eight sites were initially identified by EDR (including the Anderson & Middleton property). Of these, seven sites were eliminated from further evaluation because the sites were listed on the RCRIS, FINDS, FTTS, or UST databases only; eight sites are located cross-gradient or upgradient and groundwater flows away from the Anderson & Middleton site; four sites are hydraulically isolated from the Anderson & Middleton site by the Hoquiam River; three sites had a final cleanup report on file with Ecology; one site had a No Further Action (NFA) on record; and one site is located cross-gradient but groundwater was not affected. The remaining four sites, categorized as low- to moderate-impact sites, are discussed in more detail below in Section 2.0, Affected Environment.

Aberdeen Log Yard

Thirty-one sites were initially identified by EDR. Of these, 11 sites were eliminated from further consideration because the sites were listed on the RCRIS, FINDS, FTTS, or UST databases only; 10 sites are located cross-gradient and most likely discharge to the Chehalis River to the southeast; 8 sites are cross- or upgradient from the Aberdeen Log Yard site but groundwater flows southwest and most likely discharges in to Grays Harbor; 1 site is hydraulically isolated from the Aberdeen Log Yard site; and 1 site had an NFA on record. The remaining site, categorized as a low- to moderate-impact site, is discussed in more detail below in Section 2.0, Affected Environment.

2. Affected Environment

Information about the historical land use, physical environment, and hazardous materials sites of concern for the Anderson & Middleton Alternative and Aberdeen Log Yard Alternative sites are presented below.

What is the historical land use of the study area?

The build alternative sites (Exhibit 1) and adjacent properties have been used primarily for various industrial purposes since the early 1900s.

Anderson & Middleton Alternative Site

The Anderson & Middleton Alternative site in Hoquiam consists of approximately 105 acres located on the north shore of Grays Harbor, west of the Hoquiam River. The site was first developed in 1901 for the Grays Harbor Lumber Company (GHLC) and began operation as a saw mill. The lumber mill operated for approximately 60 years except when it was shut down

for 4 years between 1930 and 1934. Anderson & Middleton Lumber Company acquired the property from GHLC in late 1962. In 1963 and 1964, the central portion of the property was backfilled with sediments dredged from Grays Harbor, increasing the size of the property and creating a new shoreline farther to the south. These dredged sediments can also be found in the area under what is now the asphalt pad in the center of the site. Crushed rock was placed on top of the dredged sediment throughout the site to provide a level surface for paved and gravel roadways. Anderson & Middleton demolished the saw mill shortly after purchase of the property and has used the site primarily to process and sort logs. A refuse woodwaste burner was located on the southwestern portion of the site.

Aberdeen Log Yard Alternative Site

In the early 1900s, the shores of the Chehalis River and Grays Harbor in Aberdeen were developed with lumber and saw mill facilities. The mills were typically built on piles over the water to facilitate the transport of raw logs to ships and mills. Wood waste and sawdust generated by the mills were dumped into the river, leaving deposits of wood debris. Saw mill operations at the Aberdeen Log Yard Alternative site ended sometime between 1948 and 1971. Since that time, the site has been used mostly for log storage.

The river shoreline was extended southward by backfilling with sediments dredged from Grays Harbor and the Chehalis River and by the accumulation of wood waste and other fill materials. Sometime between 1971 and 1981 the shoreline was again filled in and extended southward to its present position.

What is the physical environment of the study area?

The physical environment of the project area determines the potential fate, degradation, and transport of contaminants into the environment. Generally, the fate and transport of contaminants is controlled by the chemicals' mobility, rate of degradation, travel pathways after release, and whether the environment enhances or limits the transport of contaminants along these pathways.

Topography

Anderson & Middleton Alternative Site

The Anderson & Middleton Alternative site is relatively flat. Average surface elevations range from about 10 to 16 feet above mean lower low water (MLLW), with slopes trending down to the shore on the southern border of the site. The topography of this site has also been formed by river sediment deposition, along with artificial filling during the 1960s and subsequent modifications of the area for development (Landau Associates 2009a).

Aberdeen Log Yard Alternative Site

Surface elevations at the Aberdeen Log Yard Alternative site range from 4 feet MLLW near the shoreline to approximately 15 feet MLLW. In the mid-1800s, the shoreline was located north of the present-day site, and the entire site consisted of tidal mudflats. Backfilling with dredged sediments likely occurred from north to south. By 1966, the majority of the site was

filled except for the southeast corner. Sometime between 1974 and 1984, the southeast corner was backfilled.

Geology and Soils

The geology of the study area consists of predominantly Quaternary Period alluvial sedimentary deposits from the nearby Hoquiam River and adjacent Grays Harbor. The Quaternary alluvium is deposited in streambeds and typically consists of silt, sand, and gravel with a relatively low clay content (Walsh et al. 1987), although sand is the dominant material. Additional information can be found in the Geology and Soils Technical Memorandum (WSDOT 2009e).

What is the Quaternary Period?

The Quaternary Period is the geologic time period from about 2 million years ago to the present. It includes two geologic epochs, the Pleistocene Epoch (the most recent Ice Age) and the Holocene Epoch (the present interglacial period).

Anderson & Middleton Alternative Site

The Anderson & Middleton Alternative site is located in a former tidal flat area. A preliminary geological evaluation conducted at the Anderson & Middleton site indicated that the upper soil unit includes fill material and wood waste from previous backfilling and other site activities. The upper fill unit encountered in the explorations ranges in thickness from about 10 to 15 feet. In general, the native silt consists of a very soft to medium stiff silt of high plasticity with sand, clay, and organics (Landau Associates 2009a). The dredge material was observed at the adjacent Port of Grays Harbor Industrial Development District #1 (IDD#1) site as silty sand to sandy silt overlying native silt (Landau Associates 2007a).

Aberdeen Log Yard Alternative Site

The Aberdeen Log Yard Alternative site is located in a former tidal flat area. A preliminary geological evaluation conducted at the Aberdeen Log Yard in 2008 indicated that the upper soil unit includes fill material and wood waste from previous backfilling and site activities. The fill material consists of dredged sediments containing silts, sands, and gravels from the Chehalis River and Grays Harbor (Olympus Environmental 1993). Fill thickness encountered during the 2008 exploration ranges from about 5 feet to greater than 12 feet (Landau Associates 2009b).

Groundwater

Based on the properties' location adjacent to the tidally influenced Chehalis and Hoquiam rivers and the relatively flat topography, groundwater elevations at the properties will fluctuate with seasonal and tidal influences, causing maximum elevations to generally occur during the winter and spring months. The overall direction of groundwater flow is anticipated to be to the south toward Grays Harbor, except when groundwater is under tidal influence. Groundwater flow will generally be inhibited during periods of high tide and enhanced during periods of low tide (Landau Associates 2007b). Groundwater elevations measured by CH2M HILL in 2009 (Attachment A) were about 6 to 7 feet below ground surface (bgs) at the Anderson & Middleton Alternative site, and ranged from approximately 7 to 11 feet bgs at the Aberdeen Log Yard Alternative site.

Sediment

Potential sources of sediment contamination are related to the historical use of the upland area as well as National Pollutant Discharge Elimination System (NPDES) discharges and urban storm water runoff in the vicinity of the sites.

Four NPDES permit holders were identified near the Aberdeen Log Yard site. Information from their respective NPDES permit fact sheets are presented below:

- Aberdeen Log Yard may be a historical source for wood wastes from the sawmills and log yard areas and petroleum contamination from maintenance activities.
- The City of Aberdeen wastewater treatment facility may be a source of various pollutants. As documented in the NPDES permit factsheet, this facility had multiple violations of biochemical oxygen demand, total suspended solids, residual chlorine, and bacteria limits. Acute whole effluent toxicity testing standards were exceeded possibly due to elevated ammonia levels. In addition, thousands of gallons of solids with minimal treatment were washed out of the system and discharged to Grays Harbor in December 2005. These solids may contain elevated levels of pollutants such as metals and nutrient.
- The Aberdeen Sanitary Landfill may be a historical source of leachate potentially containing various toxic substances subsequently discharged into the Grays Harbor. Improvements have been made over the years and leachate from the landfill currently discharges to the City of Aberdeen wastewater treatment facility sewer system.
- The Weyerhaeuser Cosmopolis Facility is a part of a larger sorting yard. Some of the industrial processes may include repairs, servicing, and washing of heavy equipment and trucks used in the log yard. Elevated dioxin concentrations were observed in the historical discharge data. In addition, this facility had multiple recent violations of oil and grease and total suspended solids permit limits and therefore may be a potential source of contamination.

The only NPDES permit holder located near the Anderson & Middleton site was the Anderson & Middleton site owner. This site had two discharge outfalls that are currently inactive. Historical sources of contamination may include wood waste from the log storage areas and petroleum products from the tank full storage area, maintenance building, and equipment building. Due to tidal influence in the Grays Harbor area, contamination from downstream sources within the vicinity area may also affect site sediment quality. Potential point sources from the immediate downstream area include wood waste from log sort yards and storage areas. Discharge data from ITT Rayonier showed detected dioxin concentrations in excess of the water quality standard; therefore, this may be a potential source of dioxin contamination. Limited contamination is expected to be associated with the City of Hoquiam wastewater treatment facility because no violations of the permit discharge requirements have been reported for this facility.

Two active NPDES discharges are located in between the Anderson & Middleton and the Aberdeen Log Yard sites and may affect sediment quality in both sites. The Port of Grays Harbor Equipment Maintenance Facility maintains log loaders and other equipment for the Port of Grays Harbor and its tenants. Limited discharge monitoring reports were submitted for this facility, and the available discharge concentrations were below the associated permit limitations; therefore, limited contamination is expected from this facility. The Port of Grays Harbor Biodiesel Production Facility discharges its wastewater to the Aberdeen wastewater treatment facility sewer system. No additional contamination from point source discharge is expected from this facility other than those included in the City of Aberdeen wastewater treatment facility discharge.

In addition to individual NPDES permit holders, several urban storm drains and storm water outfalls are located near the two potential sites. Typical storm runoff in the area may include potential pollutants such as metals in vehicle exhaust, paint, rust, metal plating and tires, spilled or leaked oil and petroleum products, lawn pesticides and fertilizers, animal waste and organic matter, and cleaners.

Two storm water outfalls are located in or are near the Aberdeen Log Yard site; one of these was located near the mouth of the Hoquiam River. In 1988, Ecology inventoried potential urban storm drains in the inner Grays Harbor area. Although that study indicated that the water quality observed in these storm water outfalls was within the expected range for typical urban storm drains, the study further concluded that these observations might indicate potential improper wastewater connections.

The 1988 inventory indicated that there were no storm water outfalls in or near the Anderson & Middleton site; however, due to the proximity of the dredge area for the Anderson & Middleton site to the Hoquiam River, these areas might be affected by the outfalls located upstream along the Hoquiam River. Specifically, the 1988 inventory indicated that there may be residential greywater discharge to the Hoquiam River. Greywater may include various contaminants such as pathogens, cleaning products, oil and grease, and nutrients. The northern boundary of the Anderson & Middleton site was bordered by a railroad, which could be a potential source for petroleum contamination and wood preservatives.

Boat yards and shipping within the vicinity area of these two sites may be a potential source of tributyltins and petroleum products from boat coating and accidental spills, respectively. Available bathymetric surveys suggest that the Anderson & Middleton site might be in a scouring environment, while the Aberdeen Log Yard site might be in a depositional zone (David Michalsen, personal communication, January 9, 2009). Additional studies such as hydrodynamic modeling will be required to verify this. The potential for re-deposition of contaminated sediment from upstream sources, if present, would increase in a depositional environment.

Additional details of about the existing sediment conditions can be found in Attachment B of this memorandum.

What are the research and investigation summary results?

Topographic Maps

Anderson & Middleton Alternative Site

On the 1957 map, the southeast and southwest portions of the Anderson & Middleton Alternative site contain wetland areas. Several roads and a railroad spur are shown running north and south through the site. Buildings associated with the Grays Harbor Lumber Company's sawmill are depicted, and a circular structure labeled "stack" on the southwestern portion of the site is located north of the main building. On the 1973 map, buildings that were present on the 1957 map have been removed from the site, and several unpaved roads are mapped that were not present on the 1957 map. The 1983 map is relatively unchanged compared with the 1973 map. All of the roads on the site appear to be unpaved. The site is also relatively unchanged in the 1994 map. One building is located on the north side of the site. One paved road runs from the north to the south side of the site, approximately half the distance through the site. The area east of the site has been filled in.

Aberdeen Log Yard Alternative Site

The 1947 map shows several structures in the northern section of the Aberdeen Log Yard property near the railroad tracks. The southern portion of the property is under water and part of Grays Harbor. Fewer structures are shown on the property on the 1957 map, and most of the southern portion is under water. A road and dock extend southward into Grays Harbor, and an additional road appears on the western edge of the property. A small area in the eastern section of the property is outlined and labeled "ruins." On the 1973 map, the road and dock extending into Grays Harbor have been removed. Several small buildings and a round structure border the property on the northeast and two additional buildings are shown on the northwestern portion of the property. On the 1983 map, the property has been filled in, extending the shoreline southward, and several additional structures are shown in the northwest portion of the property and adjacent to the property on the northeast side. In the 1994 map, the structures on the northwestern part of the property have been removed and an additional road is shown entering the site from the west.

Aerial Photographs

Anderson & Middleton Alternative Site

The site in the 1966 photo appears cleared of vegetation and contains several unpaved roads. Many areas of the site were used for timber storage, including floating timber visible in a slip on the south side of the site. Two ships are anchored at the slip. There is a large building located in the southwest corner of the site, and two smaller buildings are on the northern edge of the site near 7th and 8th Streets. Trucks are also visible at the site. A large, circular building is visible east of the site on the west bank of the Hoquiam River. Several rail cars are visible on the railroad tracks north of the site. In the 1978 photograph, the site appears to be used for timber storage. Two previously visible buildings are now demolished: one on the south side and one on the north side of the site near 7th Street. One ship is anchored at the slip. Again, several rail cars are visible on the railroad tracks. The eastern circular building had been demolished. In the 1988 photo, the site is also used for timber storage. There are no

ships anchored at the slip. The area just east of the site appears to be a vacant field. A paved road south of the rail yard now connects the southern ends of 5th and 8th Streets on the north side of the site. West of the site, multiple buildings have been built on both sides of 5th Street. In the 1993 photograph the site appears generally unchanged from the 1988 photo, and in the 2003 photo the site again appears generally unchanged from the 1993 photo. There is an area of dark soil west of the slip that might have been used for burning.

Aberdeen Log Yard Alternative Site

In the 1971 photograph, the site is bounded by the Chehalis River to the south, East Terminal Way to the west, and railroad tracks to the north. The northwest corner of the property is vacant. The eastern and southern portion of the site is used for log storage and includes several buildings. The southeast corner of the site is tidelands and submerged land. The area north of the site, north of the railroad tracks, is developed as a commercial and residential area. Several commercial buildings are visible northeast of the site. The area west of East Terminal Way is used for log storage. The 1981 photo is similar to the 1971 photo except that the southeast corner of the property has been filled. It appears that several buildings have been constructed near the center and the north end of the site. The area east of the site has also been filled. There is little to no change to the northern portion of the site. The site in the 1994 photo appears relatively unchanged from the 1981 photo. Several new buildings are visible west of the site, and in the area north of the site, several residential areas have been replaced by commercial buildings. Development has extended to the waterfront west of the site. In the 2006 photo the building at the center of the site has been demolished, and no buildings remain on the property. Several areas on the site are unused and the remaining areas of the site appear to be used for log storage.

Sanborn Maps

Anderson & Middleton Alternative Site

The 1902 Sanborn map shows railroad tracks on the northeast side of the site. The rest of the site on the map is not yet filled in with sediment and is therefore labeled “Grays Harbor.” The 1907 map includes the “8th Street Extension” and shows the Grays Harbor Lumber Company’s sawmill west of the 8th Street Extension. The sawmill includes the mill and “logway” into Grays Harbor, a machine and blacksmith shop, several lumber sheds, boiler, multiple lumber piles, a steam dry kiln, fuel bins, a sorting shed, a planking mill with a shaving fill area, and an office building. At the southern end of the extension is a city dock and boat-loading float. Much of the site is labeled as “refuse fill.” The 1916 map shows the Grays Harbor Lumber Company’s expansion to include a saw mill, lumber yard, and lumber sheds. Three large round features (possibly aboveground storage tanks) are visible. The map indicates that power at the saw mill is a combination of city electric or steam produced by burning sawdust and ground slabs (wood scraps).

On the 1928 map, little change is visible from 1916 except for the addition of some land around the site. Approximately 500 feet of land has been created by backfilling with sediments east of the 8th Street Extension. “Waterway 3” is “proposed” at the west end of the site. The Wood Gutter Company is visible in the northwest portion of the site and has “fuel”

labeled at the planer building's east side. A "boiler" is located next to the buildings in the southwest portion of the site. The map describes the power source for the Grays Harbor Lumber Company's sawmill as "Steam and Electric (I.E.P) Fuel, Mill Waste, Automatic Feed." The 1948 Sanborn map is similar to the 1928 map with the following exceptions: the map shows the new operator of the mill as Blagen Mill, one of the three large round features closest to the machine shop has been demolished, a new building (Planking Mill and Sorting Table) is shown on the east side of the property, and the two buildings south of the Mill Office building (that is, Dressed Lumber Shed) in the northeast portion of the site are no longer visible.

The 1969 map is similar to the 1948 map except for the approximately 150 feet of land that was created east of the site by backfilling with sediments. Although most of the structures are still visible, the map indicates that the site is used for log storage only and still operated by Blagen Timber Company, noted on the map as a division of the Anderson & Middleton Lumber Company. A large, circular, concrete tank appears labeled "refuse" tank. The Wood Gutter Company building visible in the 1928 map has been demolished and the office building shows an address of 801 8th Street.

Aberdeen Log Yard Alternative Site

The property was historically occupied by lumber and saw mills: Hart-Wood Lumber in 1906, Western Lumber Company in 1914, American Mill Company (formerly Hulbert Mill) in 1928 and 1948, and a sawmill log dump (noted as "Not in operation" on the 1989 Sanborn map). On the 1906, 1914, 1928, and 1948 Sanborn maps, the sawmill is located in the southeastern portion of the site at the south end of West Heron Street. This sawmill featured a boiler, refuse burner, and fuel storage areas. The sawmill log dump shown on in the 1989 map is located in the northeast quadrant of the site, west of West Heron Street, near the railroad spurs. The sawmill shown on the 1906, 1914, 1928, and 1948 maps does not appear in the 1989 map. The adjacent property to the west of the site was also occupied by lumber mills in the 1928 and 1948 Sanborn maps.

Visual Site Reconnaissance

Anderson & Middleton Alternative Site

No buildings were present on the site with the exception of a small office building located near the entrance on 8th Street and Earley Industrial Way. The site was unpaved except for a concrete/asphalt pad located near the center of the site. A gravel road meanders throughout the site and along the shore. The site appeared vacant and unused. No log storage activity was observed. There were no visible indications of hazardous materials or contamination of the property.

Aberdeen Log Yard Alternative Site

No buildings were present on the site, with the exception of a small shed containing spill containment supplies. All buildings were demolished prior to 1993 with the exception of the truck scale and associated office (removed in October 1996) and a shack (removed April 1998). The following observations were made during the site reconnaissance that indicated the potential for contamination at the site:

- One empty, unlabeled 25-gallon transformer; it might have contained polychlorinated biphenyls (PCBs)
- Approximately 20 pole-mounted lights of unknown age; they might contain mercury

Attachment E includes photographs taken during both site visits.

Regulatory File Review

Anderson & Middleton Alternative Site

The Anderson & Middleton property address is listed in the federal FINDS database because there is a NPDES permit for the site and because the site is in Ecology's Facility/Site Identification System. Reviews of previous reports and documents conducted as part of environmental site assessments indicated the potential for recognized environmental conditions (RECs) due to past wood-burning activities and wood preservative use at or near the site.

Aberdeen Log Yard Alternative Site

The Aberdeen Log Yard property was listed as a NPDES permit holder with a permit number of SO3002762. The NPDES permit file reviewed did not contain analytical data. The list of contaminants to be analyzed under the permit included biochemical oxygen demand, pH, zinc, and oil and grease. The site was assigned SIC code #2411-Logging.

No environmental liens or activity and use limitations were found in the Environmental LienSearch™ report for the Aberdeen Log Yard property. The report was provided by EDR on September 23, 2008, and contains a copy of the deed dated September 18, 1985 (Inst. no. 85 18489) (Attachment D). The property ownership was assessed by reviewing the deed information, which states that the property is currently owned by Weyerhaeuser Company.

Environmental Site Investigations

Environmental site investigations conducted at the Anderson & Middleton and Aberdeen Log Yard properties are presented below.

Anderson & Middleton Alternative Site

Searches of pertinent environmental regulatory lists and databases and historical information identified the following potential recognized environmental conditions and associated contaminants at the site:

- Potential presence of dioxins from lumber mill smokestack emissions at the site and from Northwestern Lumber Company
- Potential presence of metals and pentachlorophenols from wood-preserving compounds
- Potential presence of PCBs, polycyclic aromatic hydrocarbons (PAHs), and metals from machinery maintenance and repair
- Potential presence of petroleum from vehicle fueling spills, heating operations, and storage tank leaks

- Potential presence of methane gas from decomposing subsurface wood waste.

In 2007, a geotechnical design study was conducted at the nearby IDD#1 site (Landau Associates 2007a). During the study, a number of test pits and soil borings were evaluated to assess subsurface conditions. The study found that the upper subsurface soil unit consists of dredged fill material from previous site backfilling, overlying native material. Wood waste was observed in some of the locations at depths ranging from 6 to 9 feet below ground surface. During the excavation of the test pits, hydrogen sulfide and methane gas odors were detected. The presence of hydrogen sulfide and methane are likely caused by decomposed wood waste and are likely to be present at the Anderson & Middleton site because of the site's past use as a sawmill and for log storage.

A Phase II ESA was completed in November 2009 by CH2M HILL (Attachment A). The purpose of the Phase II ESA was to identify potential soil and groundwater contamination that might be present at the site as a result of current or past releases. Field sample collection was completed on December 17, 2008, and consisted of the collection of 12 soil samples and 6 groundwater samples. The samples were analyzed for potential contaminants including petroleum hydrocarbons, volatile organic compounds (VOCs), metals, PAHs, PCBs, and dioxins and furans. The sample locations and types of analyses conducted were determined based on past operational history of the site as identified from historical sources such as Sanborn Maps and historical aerial photographs. The analytical results were compared to applicable regulations including the MTCA (WAC 173-340) cleanup levels and dangerous waste regulations. Additional groundwater samples were collected in January of 2009 and compared to surface water quality standards (SWQS) (WAC 173-201A). The results of the Phase II ESA indicated that soils and groundwater at the site were relatively unaffected by past industrial activities.

In September 2009, WSDOT conducted a Supplemental Soil and Groundwater Investigation (Supplemental Investigation), to provide additional information about groundwater conditions at the site. The Supplemental Investigation involved collecting groundwater sample from areas not previously sampled during the Phase II ESA. On September 17 and 18, 2009, analysts collected seven groundwater field samples. These samples were analyzed for potential contaminants including petroleum hydrocarbons and total and dissolved metals. Analysts compared the analytical results to applicable regulations, including the MTCA (WAC 173-340) cleanup levels and the SWQS (WAC 173-201A). The results of the Supplemental Investigation were reported in the Supplemental Soil and Groundwater Investigation Report, which was prepared in November 2009 (Attachment C). The results confirmed that groundwater at the site does not contain wide-spread contamination from past industrial activities, although localized areas of contamination may exist. An unidentified liquid was observed in groundwater at two locations near the west edge of the proposed launch channel approximately 185 feet and 225 feet north of the Grays Harbor shoreline. Sufficient groundwater was not available for collection. A soil boring was drilled at this location and no evidence of contamination was observed in soil.

A sediment characterization analysis was conducted in February 2009 by CH2M HILL (Attachment B). The purpose of the sediment characterization was to identify potential sediment contamination that might be present in the area of the launch channel as a result of historical activities on the upland area as well as nearby industrial discharge sources. The reconnaissance-level sediment sampling indicated that dredged sediments at the Anderson & Middleton site are relatively clean and may be suitable for unconfined open-water disposal. Additional testing following the U.S. Army Corps of Engineers' DMMP procedures will be required to confirm this finding.

Aberdeen Log Yard Alternative Site

A July 17, 1997, an interoffice communication titled *Excavation of Contaminated Soil Report* was prepared by Charlie Barrett for Dennis Davies, both with Weyerhaeuser Company (Weyerhaeuser Company 1997). The field investigation included soil samples collected in the vicinity of an approximately 50-gallon hydraulic oil release from a log-stacking machine. The release occurred to the ground surface in the north-central portion of the property.

Approximately 16 cubic yards of petroleum-contaminated soil was excavated and removed from the site. Groundwater was not encountered during soil excavation. Laboratory test results concluded that concentrations of total petroleum hydrocarbon (TPH)-diesel and TPH-heavy oil in soil were not detected above the method detection limits of 20 milligrams per kilogram (mg/kg) for diesel and 40 mg/kg for heavy oil from all six soil samples collected from the bottom of the excavation. Additionally, four sumps approximately 4 feet deep were installed in the area of the oil release to drain surface water due to heavy rain. The sump excavation was conducted prior to TPH-contaminated soil excavation. Approximately 2,000 gallons of water was vacuumed from the sumps and treated at Weyerhaeuser's Cosmopolis Pulp Mill after the soil excavation. The sump excavation did not encounter groundwater.

A Storm Water Pollution Prevention and Monitoring Plan for Weyerhaeuser Company Harbor Port Sort Yard was prepared by Thomas Scheidman, Jr. of Weyerhaeuser as part of Weyerhaeuser's NPDES permit number S03-002762 in July 1996 and updated most recently in October 2007 (Weyerhaeuser 2007). Under Section 2.10, Significant Spills or Leaks of Toxic or Hazardous Pollutants, the following events were reported:

- Weyerhaeuser performed a site assessment in 1992 and 1993. "As a result of that assessment, hydrocarbon contaminated ground was excavated and removed by Olympus Environmental Incorporated in 1993 – 1995." The Olympus report is reviewed below.
- "A hydraulic oil spill of approximately 100 gallons occurred in May, 1997." The incident report, *Excavation of Contaminated Soil Report*, is discussed above.
- "Another hydraulic oil line spill of 20 gallons occurred on 2/18/98. The contaminated soils were removed and site assessment indicated that the TPH of the soils in the spill area was non-detectable." No additional report regarding this spill was provided.

A soil remediation report was prepared by Olympus Environmental, Inc. for Weyerhaeuser in May 1993 (Olympus 1993). The report stated that approximately 50 to 100 gallons of used

lubricating oil being stored in drums was spilled during drum removal operations. The site map indicated the spill occurred north of the property.

A 1988 Site Plan prepared for the Weyerhaeuser Company by the Harris Group showed detailed site features of the former sawmill located near the central north portion of the site. This site plan was updated as late as 1998. The features of the former sawmill included the main sawmill buildings, log barkers, sorter, dip tank, strapping station, truck shop, truck scale, a substation, and offices. Most of these structures were noted as having been removed. The 1988 site plan also showed railroad spurs that extended to the eastern part of the sawmill.

Similar to the Anderson and Middleton site, hydrogen sulfide and methane are likely to be present at the Aberdeen Log Yard because of the site's past history. A portion of the Aberdeen Log Yard was backfilled with sediment dredged from the Chehalis River, accumulated wood waste, and other site-related fill material. As discussed previously, hydrogen sulfide and methane gas are generated as a result of the decomposition of wood waste.

A Phase II ESA was completed in February 2009 by CH2M HILL (Attachment A). The purpose of the Phase II ESA was to identify potential soil and groundwater contamination that might be present at the site as a result of past releases. Field sample collection was completed on December 17, 2008, and consisted of collection of 12 soil samples and 6 groundwater samples. The samples were analyzed for potential contaminants including petroleum hydrocarbons, VOCs, metals, PAHs, PCBs, and dioxins and furans. The sample locations and types of analyses conducted were determined based on past operational history of the site as identified from an interview with the property owner representative and historical sources such as Sanborn Maps and historical aerial photographs. The analytical results were compared to applicable regulations include the MTCA (WAC 173-340) cleanup levels and dangerous waste regulations. Additional groundwater samples were collected in January of 2009 and compared to SWQS (WAC 173-201A). The results of the Phase II ESA indicated that soils and groundwater at the site were relatively unaffected by past industrial activities.

In September 2009, WSDOT conducted a Supplemental Investigation, to provide additional information about groundwater conditions and to evaluate the nature and extent of contamination in subsurface soil in select areas of the Aberdeen Log Yard from historical activities at the site. From September 15 through 18, 2009, analysts collected 8 groundwater and 12 soil field samples. The results of the Supplemental Investigation were presented in the Supplemental Soil and Groundwater Investigation Report, which was prepared in November 2009 (Attachment C), and are summarized below.

The groundwater samples were analyzed for potential contaminants, including petroleum hydrocarbons and total and dissolved metals. One groundwater sample was also analyzed for PAHs. Analysts compared groundwater analytical results to applicable regulations, including the MTCA (WAC 173-340) cleanup levels and the surface water quality standards (WAC 173-201A). Four total metals (arsenic, chromium, lead, and manganese) exceeded MTCA

Method B clean-up levels (CULs) in one or more samples. Three dissolved metals (arsenic, lead and manganese) exceeded MTCA Method B CULs. Dissolved copper exceeded SWQC at two sample locations. Dissolved lead exceeded SWQC in one sample location. Total lead and dissolved lead concentrations exceeded MTCA Method A CUL for lead at one location. Diesel-range petroleum hydrocarbons were detected in 2 samples but did not exceed the MTCA Method A CUL.

A cultural resources test trench investigation, conducted in September 2009, identified possible contamination in soil in two locations in the central-eastern portion of the site, approximately 150 feet and 310 feet west of the property boundary with the City of Aberdeen Water Treatment Plant. Soil samples were collected at both locations during the Supplemental Investigation and were analyzed for PAHs and TPH. One location was also analyzed for VOCs. Groundwater was sampled at two locations. Both groundwater samples were analyzed for TPH and total and dissolved metals. Soil and groundwater analytical results did not confirm the cultural resource investigation observations although localized areas of soil and groundwater contamination are likely to exist throughout the site.

During a geotechnical investigation in July 2009, a sheen, floating layer on the groundwater surface, and stained soil were observed at a monitoring well in the southern portion of the site about 125 feet north of the Grays Harbor shoreline, near the western portion of the proposed launch channel. During the Supplemental Investigation, petroleum-contaminated soil was observed in soil borings on the north and south sides of a concrete slab. Groundwater was sampled downgradient of the identified petroleum contamination and petroleum hydrocarbons were not detected.

Together, these results indicate the soil and groundwater are relative unaffected by past industrial activities although localized areas of contamination are present in selected areas of the site.

As discussed above, a sediment characterization analysis was conducted in February 2009 by CH2M HILL (Attachment B), at both alternative sites. The purpose of the sediment characterization was to identify potential sediment contamination that might be present in the area of the launch channel as a result of historical activities on the upland area as well as nearby industrial discharge sources. The reconnaissance-level sediment sampling indicated that dredged sediments at the Aberdeen Log Yard site may require upland disposal. Additional testing following the U.S. Army Corps of Engineers' DMMP procedures will be required to confirm this finding.

Interviews

Anderson & Middleton Alternative Site

Mr. Middleton stated that Anderson & Middleton purchased the property from GHLC in 1962. GHLC had occupied the site since 1901. Prior to 1901, the property was undeveloped. Mr. Middleton stated that Anderson & Middleton used the property for log storage, sorting, and exporting, and that the site is currently vacant.

GHLC had used the site for the production of lumber that did not include wood treatment. Mr. Middleton stated that upon purchase of the property, Anderson & Middleton demolished the sawmill building. One building currently exists on the property to the north and is used for offices. Mr. Middleton stated that the southern half of the property was backfilled with dredge material from Grays Harbor in about 1964. Also, the western portion of the property near the former shake mill, east of 5th Street, was backfilled with wood waste and crushed rock from a quarry owned by Anderson & Middleton and located north of Hoquiam.

No materials are currently stored at the site. The herbicide Roundup is sprayed on vegetation once a year. No other materials are currently used at the site. Historical use of materials at the site associated with the former sawmill and maintenance and machine shop operations included cutting oils, industrial solvents, petroleum products, and hydraulic oils.

Mr. Middleton had no prior knowledge of underground storage tanks at the site but did discuss the potential for previously stored fuel in aboveground storage tanks. Mr. Middleton stated a refuse burner was in operation until approximately 1950 and was located in the southwestern portion of the site. The burner was brick-lined and burned wood waste.

WSDOT interviewed Hoquiam Fire Department Chief Ray Pumphrey in 2006. Chief Pumphrey had been familiar with the site for 31 years. He stated that a potential environmental concern at the site was the large aboveground storage tanks located at a truck shop in the vicinity of the site. Chief Pumphrey indicated the truck shop was located west of the northwest corner of the site.

Aberdeen Log Yard Alternative Site

Information obtained during the interview is summarized below:

- The property was purchased by the Weyerhaeuser Company from Boise Cascade in 1985.
- All buildings on the site were demolished prior to 1993, the start date of Mr. Davies' employment with Weyerhaeuser, with the exception of the truck scale and associated office (removed in October 1996) and a shack (removed April 1998).
- At the time of the interview, the property was used for log bucking and log storage.
- Previous spills on the property were reported in 1992, 1997, and 1998. The spilled material contained hydraulic and lube oil. Contaminated soil was excavated and removed from the site.
- Hazardous materials or substances (other than spill containment supplies) or wastes were not known to be stored or generated at the property.
- All utility services to the site were terminated prior to 1993.
- Four storm water outfalls are located around the perimeter of the property. Each outfall contains an oil/water separator.

What is log bucking?

Bucking is the process of cutting a felled and delimbed tree into logs. Logs destined for plywood, lumber, and pulp each have their own specifications for length, diameter, and acceptable defects.

- Mr. Davies was not aware of the presence of any USTs on the property.
- Mr. Davies stated that environmental remedial activities were conducted on the property in 1992 and 1993 by Olympus Environmental, Inc. (After further review of this report, it is unclear if the remediation occurred on the Weyerhaeuser property or on a different site to the northwest as depicted in the report's site map.)

Environmentally relevant documents such as a previous spill and remediation report, a storm water pollution prevention plan, and facility drawings were provided by Mr. Davies.

What are the hazardous materials sites of concern in the study area?

Hazardous materials sites located within the study area that were identified as sites of concern for each build alternative were placed into two risk categories as described below.

Information about each site is also presented below.

Anderson & Middleton Alternative

Low- to Moderate-Impact

Exhibit 3 lists three low- to moderate-impact sites (City Hall-Map identification [ID] B6, Truck Stop-Map ID 10, and the Anderson & Middleton site-Map ID A1, A2), and Exhibit 4 lists those sites with USTs within one-quarter mile of the property. Exhibit 5 depicts the locations of the low- to moderate-impact sites identified near the Anderson & Middleton Alternative site.

The two sites, City Hall (Map ID-B6) and the Truck Stop (Map ID-10), are considered low- to moderate-impact sites primarily because TPH was previously detected in groundwater at those sites. The third site, the subject property Anderson & Middleton Lumber Co (Map ID-A1, A2) has previously detected levels of methane gas and hydrogen sulfide that could pose a risk to worker safety. The three sites are discussed below, and Exhibits 2 and 5 show their locations.

Anderson & Middleton (Map ID-A1, A2). The address listed for Anderson & Middleton property is 815 Eighth Street. Reviews of previous reports and documents conducted as part of environmental site assessments indicated that due to past wood-burning activities and wood preservative use at or near the site, the potential exists for RECs at the site.

The Anderson & Middleton property address is listed in the FINDS database because there is a NPDES permit (SO3000391D) for the site and because the property is in Ecology's Facility/Site Identification System. The NPDES permit file reviewed at Ecology did not contain analytical data.

EXHIBIT 3

Site Screening Summary of Low- to Moderate-Impact Sites: Anderson & Middleton Alternative Site

Map ID	Site Name	Site Address	Site Location Relative to the Project Area	Site Information Sources	Hazardous Materials of Concern, Site Conditions of Concern, Affected Media and Remediation History	Risk Rating and Rationale
A1, A2	Anderson & Middleton Lumber Co.	815 Eighth Street, Hoquiam	Alternative Site	NPDES, FINDS	Localized petroleum-contaminated soil and groundwater contamination due to historical use as sawmill and log yard. Methane gas and hydrogen sulfide from decomposition of wood waste in soil borings in 2009.	Low to moderate impact due to site use history, methane gas and hydrogen sulfide detections in subsurface
B6	City Hall	609 8th Street, Hoquiam	Cross-gradient, ~721 feet Northeast of the subject property	Leaking Underground Storage Tank (LUST), Independent Cleanup Report (ICR)	TPH in soil and groundwater reported cleaned up in 2000	Low to moderate due to TPH in groundwater and proximity cross-gradient to subject property
10	Truck Stop	5th and Railroad, Hoquiam	Upgradient, ~1036 feet Northwest of the subject property	LUST, UST	TPH in groundwater reported cleaned up 1991	Low to moderate impact site due to TPH in groundwater, proximity to the site, and located hydraulically upgradient from subject property

EXHIBIT 4

Sites with USTs Within One-Quarter Mile of the Anderson & Middleton Alternative Site

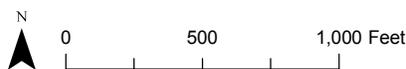
Map ID	Site Name	Site Address	UST Status
B4	Hoquiam Fire Station	625 8th Street, Hoquiam	One 111- to 1,100-gallon tank closed in place in 2000.
B6	City Hall	609 8th Street, Hoquiam	One diesel UST (1,101- to 2,000-gallon) and three USTs containing gasoline and heating oil (capacity unknown).
10	Truck Stop	5th & Railroad, Hoquiam	Two USTs were removed in 1996 (capacity unknown).



- ▲ Low- to moderate-impact site
- Build Alternative Site
- Parcel

Source: WSDOT (2006) Aerial Photo, Grays Harbor County (2006) GIS Data (Street), WSDOT (2004) GIS Data (State Route), and Environmental Data Resources (2008) GIS Data (Listed Site). Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for layers is NAVD88.

Exhibit 5. Location of Low- to Moderate-Impact Sites at the Anderson & Middleton Site
Pontoon Construction Project



Hydrogen sulfide and methane gas were observed during geological explorations at the site (Landau Associates 2009a and 2009b). The hydrogen sulfide odor and presence of methane are likely caused by the decomposition of wood waste. The upper soil units contain fill material and wood waste from previous backfilling and site activities. Methane gas can create a fire hazard if ignition sources are present during excavation activities and if concentrations are sufficiently high (that is, between 5 and 15 percent). The presence of methane gas could also present a health concern for workers during trenching work if the work space is not adequately ventilated.

The results of the Phase II ESA and Supplemental Investigation conducted at the site by WSDOT in 2008 and 2009 indicate that the soil and groundwater quality at the site is relatively unaffected by past historical use. However, there is evidence of localized soil and groundwater contamination in at least one area of the site (see Attachment C).

WSDOT conducted a sediment characterization in February 2009 to identify potential sediment contamination that might be present in the area of the launch channel as a result of historical activities in the upland area as well as nearby industrial discharges sources. The reconnaissance-level sediment sampling did not indicate that the dredged sediments at the Anderson & Middleton site contained chemical contaminants at levels above the DMMP screening levels. Additional testing following the U.S. Army Corps of Engineers' DMMP procedures will be required to confirm this finding. Attachment B includes a copy of this sediment characterization report.

City Hall (Map ID-B6). The address listed for Hoquiam City Hall is 609 8th Street. The EDR mapped site ID is B6. City Hall is listed on the LUST and ICR lists. The site is located northeast of the Anderson & Middleton property. The position of this site is hydraulically cross-gradient of the Anderson & Middleton property, a conclusion based on the flow direction toward the Hoquiam River and Grays Harbor. Remedial action included removal of diesel, leaded gasoline, unleaded gasoline, and heating fuel tanks. Ecology files reported groundwater and soil contamination cleaned up as of September 22, 2000, and therefore, the site is not expected to have an impact on the project.

Truck Stop (Map ID-10). The Truck Stop was listed at 5th & Railroad. EDR mapped this site as ID number 10 and it is listed in the LUST and UST databases. This site is located hydraulically upgradient of the Anderson & Middleton property. Leaded and unleaded gasoline tanks were removed as part of the remedial action. Ecology files report groundwater contamination cleaned up as of September 16, 1991, and therefore, this site is not anticipated to have an adverse impact on the project.

High Impact

No sites were identified as high impact to the project.

Aberdeen Log Yard Alternative Site

Low- to Moderate-Impact Sites

Exhibit 6 lists two low- to moderate-impact sites (Public Works Shop-Map ID A3 and the Aberdeen Log Yard-No Map ID), and Exhibit 7 lists those sites with USTs within one-quarter mile of the property. Exhibit 8 depicts the locations of the low- to moderate-impact sites within identified near the Aberdeen Log Yard property.

EXHIBIT 6

Site Screening Summary of Low- to Moderate-Impact Sites: Aberdeen Log Yard Alternative Site

Map ID	Site Name	Site Address	Site Location Relative to the Project Area	Site Information Sources	Hazardous Materials of Concern, Site Conditions of Concern, Affected Media and Remediation History	Risk Rating & Rational
N/A	Aberdeen Log Yard	East Terminal Road/Port Industrial Road	Target property	CH2M HILL Sediment Investigation, 2009	Localized contaminated soil and groundwater due to historical use as sawmill and log yard. Low levels of total dichlorodiphenyltrichloroethane (DDT) and dioxins/furans in launch channel sediments.	Low to moderate impact due to site use history, methane gas and hydrogen sulfide detections in subsurface, sediment contaminant detections that may require special handling and disposal at a upland facility
A3	Public Works Shop	Garfield and Heron, Aberdeen	Upgradient, ~285 feet North-northeast of the subject property	LUST, UST	TPH diesel released to soil, groundwater reportedly not impacted	Low to moderate impact site due to TPH release to soil, proximity to the site, and located hydraulically upgradient from subject property

EXHIBIT 7

Sites with USTs within One-Quarter Mile of the Aberdeen Log Yard Alternative Site

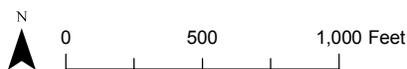
Map ID	Site Name	Site Address*	UST Status
A3	Public Works Shop	Garfield and Heron, Aberdeen	Four USTs closed in 1990 (one 1,000-gallon gasoline, one 1,500-gallon diesel, one 3,000-gallon unleaded gasoline, and one 3,000-gallon regular gasoline); one 250-gallon diesel UST removed in 1994.



- ▲ Low- to moderate-impact site
- Build Alternative Site
- Parcel

Source: WSDOT (2006) Aerial Photo, Grays Harbor County (2006) GIS Data (Street), WSDOT (2004) GIS Data (State Route), and Environmental Data Resources (2008) GIS Data (Listed Site). Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for layers is NAVD88.

Exhibit 8. Location of Low- to Moderate-Impact Sites at the Aberdeen Log Yard Site
Pontoon Construction Project



Information about the low- to moderate-impact site located near the Aberdeen Log Yard property (Public Works Shop, Map ID A3) and a discussion of the Aberdeen Log Yard are presented below. Although the Public Works site was not listed as having affected groundwater, it is located upgradient and less than 1/8 mile from the project site.

Aberdeen Log Yard. The Aberdeen Log Yard Alternative site address is listed in the federal FINDS database because there is an NPDES permit (SO3002762) for the site and because the site is in Ecology's Facility/Site Identification System. The NPDES permit file reviewed did not contain analytical data. Due to past wood-burning activities and wood preservative use at or near the site identified from previous reports and documents, the potential exists for recognized environmental conditions (RECs) at the site.

During geological explorations at the site, hydrogen sulfide and methane gas were observed (Landau Associates 2009a and 2009b). Likely caused by the decomposition of wood waste, hydrogen sulfide and methane gas were observed in the upper soil units that contained fill material and wood waste from previous backfilling and site activities. Methane gas can create a health concern for workers during trenching work if the work space is not adequately ventilated. If concentrations of methane gas are sufficiently high (that is, between 5 and 15 percent) and if ignition sources are present during excavation, a fire hazard may be created.

Groundwater samples taken in December 2008 did not contain levels of TPH, VOCs, or PAHs above MTCA cleanup levels. Detected concentrations of arsenic, chromium, lead, manganese, and vanadium exceeded MTCA cleanup levels for groundwater. Arsenic exceeded MTCA Method B cleanup levels in all samples. Concentrations of chromium and vanadium exceeded MTCA cleanup levels in groundwater at two locations. Detected concentrations of manganese and lead exceeded MTCA cleanup levels at three locations. Dissolved metals samples were not taken during the December 2008 sampling event. These samples were collected from temporary wells that created conditions for relatively high levels of suspended solids in the samples. It is likely that the relatively high metal concentrations in the test results were due to elevated turbidity and suspended solids in the groundwater samples.

Additional groundwater sampling to verify the December 2008 results, completed in January 2009, indicated that low turbidity in the samples resulted in reduced metal concentrations. Only arsenic exceeded MTCA Method B cleanup levels and did not exceed the SWQS. Total arsenic was detected at concentrations above the MTCA Method B cleanup level for groundwater in all samples. The arsenic levels most likely correspond to background concentration levels for the area. Based on these results and the fact that there is no indication of metal contamination in soil samples, there is no evidence to indicate groundwater within the property has been adversely affected. Therefore, treatment to remove contaminants might not be required before groundwater is discharged to Grays Harbor.

In September 2009, as a follow-up to the December 2008 and January 2009 groundwater testing, additional groundwater sampling was completed at the Aberdeen Log Yard site. Soil

sampling was also conducted in September 2009 in response to observed contamination during previous geotechnical and archeological investigations.

The test results for the September 2009 groundwater samples area as follows:

- Four total metals (arsenic, chromium, lead, and manganese) exceeded MTCA Method B CULs in one or more samples.
- Three dissolved metals (arsenic, lead and manganese) exceeded MTCA Method B CULs.
- Dissolved copper exceeded SWQC at two sample locations (IDs Aberdeen Log Yard (ALY-16) and ALY-18).
- Dissolved lead exceeded SWQC in one sample location at ALY-16.
- Total lead and dissolved lead concentrations exceeded MTCA Method A CUL for lead at ALY-16.
- Total lead also exceeded the MTCA Method A CUL at ALY-15.

The results of the Phase II ESA and Supplemental Investigation conducted at the site by WSDOT in 2008 and 2009 indicate that the soil and groundwater quality at the site is relatively unaffected by past historical use. However, there is evidence of localized petroleum and/or creosote contamination in soil and/or groundwater in at least three areas of the site (see Attachment C).

The reconnaissance-level sediment sampling by CH2M HILL in 2009 indicated that a portion of the dredged sediments at the Aberdeen Log Yard site may require disposal in a non-hazardous-waste landfill due to low levels of chemical contaminants. The remaining portions may be suitable for unconfined open-water disposal. Additional testing following the U.S. Army Corps of Engineers' DMMP procedures will be required to confirm this finding. Attachment B includes a copy of this sediment characterization report.

Public Works Shop (Map ID A3). Located at Garfield and Heron, the Public Works Shop is approximately 285 feet upgradient from the Aberdeen Log Yard property and is listed in the LUST database. Four USTs were closed in 1990: a 1,000-gallon gasoline, a 1,500-gallon diesel, a 3,000-gallon unleaded gasoline, and a 3,000-gallon regular gasoline tank. A 250-gallon diesel UST was removed in 1994. A non-specified amount of petroleum-contaminated soil was excavated from the tank area. Soil sample results were below MTCA Method B cleanup levels for diesel, according to a site assessment report prepared by KD&S Environmental Support Services for the City of Hoquiam (1994). Groundwater was not encountered during tank removal in 1994.

High Impact

No sites were identified as high impact for the project.

No Build Alternative

Since no construction activities would occur under the No Build Alternative, there would be no project-related potential to encounter contaminated media.

3. Potential Effects of the Project

What are standard project effects on hazardous materials?

Information collected for the hazardous materials sites identified near the project limits was analyzed to identify potential effects from construction of the proposed project. Many of the potential effects and mitigation measures for hazardous materials are similar for all construction projects. Attachment F contains a list of standard effects as well as mitigation measures.

What direct environmental effects to sensitive areas would hazardous materials have?

Build Alternatives

The build alternatives are located adjacent to environmentally sensitive areas including the Chehalis and Hoquiam rivers and Grays Harbor. Several streams and wetlands are also nearby. Additional information about environmentally sensitive receptors can be found in the Water Resources Technical Memorandum and the Ecosystems Discipline Report (WSDOT 2009f, WSDOT 2009g).

Discharge of dewatering water that contains contaminants into sensitive areas such as the Grays Harbor would have the potential to degrade water quality and impair aquatic habitat.

Dredging sediments from Grays Harbor to create a launch channel would affect ecosystems and wildlife by destroying habitats. Additional information about environmentally sensitive habitats can be found in the Ecosystems Discipline Report (WSDOT 2009g).

No Build Alternative

The No Build Alternative would not affect environmentally sensitive areas because no construction activities would occur.

What is the potential for alteration of contaminant migration zones?

The potential for alteration of contaminant migration is estimated by the extent of groundwater drawdown that might be required during dewatering operations and the presence of contaminated groundwater within the radius of influence.

Anderson & Middleton Alternative

At the Anderson & Middleton site, the dewatering zone of influence is believed to extend beyond the property

<p>What is drawdown?</p> <p>Drawdown is a lowering of the water table due to pumping of a well.</p> <p>What is a cone of depression?</p> <p>The drawdown produced at and around a pumping well results in a "cone" shape of water table levels.</p> <p>What is the radius of influence?</p> <p>The radius of influence is the radial distance from a well to a point away from the well where there is no lowering of the water table.</p>

boundary. The geology of the site and its relationship to the effects from dewatering, however, are complex and therefore were not fully investigated prior to publication of this report. Previous geotechnical investigations by Landau (2009c) have determined that soils at the A&M site have high permeability that enhances groundwater transport. The potential exists for alteration of contaminant migration plumes from nearby sites. Additional geotechnical investigations will be required in order to identify appropriate mitigation measures. Two nearby sites located within the expected radius of influence created during dewatering drawdown might have an effect on water quality because the sites have a history of hazardous material releases. (See *What are the hazardous materials sites of concern in the study area?*) City Hall is located just over one-quarter mile and cross-gradient from the Anderson & Middleton Alternative site. The Truck Stop is also located just over one-quarter mile and upgradient from the Anderson & Middleton property. Both sites have previously been listed on the LUST list. According to Ecology files, USTs were removed during remediation, and groundwater was reported as cleaned up at both sites.

Aberdeen Log Yard Alternative

The extent of the dewatering zone of influence is similar for the Aberdeen Log Yard site in that it is assumed to extend beyond the property boundaries and was not fully determined before this report was prepared. Soils at Aberdeen Log yard contain higher amounts of low-permeability silts (Landau 2009c), thereby, inhibiting groundwater transport as compared to the higher permeable sand at A&M. The geology of the site and its relationship to dewatering effects is complex and was not fully investigated prior to publication of this report. The potential exists for alteration of contaminant migration plumes from nearby sites. Additional geotechnical investigations will be required in order to identify appropriate mitigation measures.

No Build Alternative

Because no project activities would be conducted under the No Build Alternative, there would be no potential for project-related alteration of contaminant migration zones.

What effects would property acquisition have on hazardous materials?

Effects of property acquisition on hazardous materials are discussed below.

Anderson & Middleton Alternative

WSDOT would acquire the Anderson & Middleton Alternative site from the Anderson & Middleton Lumber Company. The site consists of three parcels: 05640070200, 056400600201, and 056400600202. A Phase II ESA and a supplemental groundwater investigation conducted at the site did not find wide-spread soil or groundwater contamination. Due to the historical use of the site, localized soil and groundwater contamination might be present, in particular in the southern area of the site where groundwater sheen and odor were observed during the supplemental groundwater investigation. However, WSDOT's risk of acquiring long-term cleanup liability is low since

this site is not currently engaged in a regulatory cleanup or monitoring program. If contamination soil and groundwater are encountered during construction, they would be removed as part of the project development.

Aberdeen Log Yard Alternative

The Aberdeen Log Yard Alternative site would be acquired by WSDOT from the Weyerhaeuser Company. The site consists of one parcel: 029902000101. A Phase II ESA and supplemental soil and groundwater investigation conducted at the site did not find wide-spread soil or groundwater contamination. An area of petroleum contaminated soil approximately 50 feet by 70 feet by 8 feet bgs was identified in the southern area of the site. Contaminated soil and/or groundwater may be present in additional two areas near the northeastern portion of the site. However, WSDOT's risk of acquiring long-term cleanup liability is low since this site is not currently engaged in a regulatory cleanup or monitoring program. If contamination soil and groundwater are encountered during construction, they would be removed as part of the project development.

No Build Alternative

No property would be acquired under the No Build Alternative.

What effects would project construction have on hazardous materials?

Construction effects could include encountering contaminated media during construction of the new casting basin, ancillary facilities, and new moorage facilities; accidental spills; and worker safety and public health issues. These effects and potential mitigation measures are presented in Attachment F.

Hydrogen sulfide and methane gas were observed during geological explorations at both Grays Harbor build alternative sites (Landau Associates 2009a and 2009b). The hydrogen sulfide odor and presence of methane are likely caused by the decomposition of wood waste. During construction, it is possible that hydrogen sulfide and methane gas will be encountered at both Grays Harbor build alternative sites due to the upper soil units containing fill material and wood waste from previous backfilling and site activities. At significant concentrations, 50 to 500 parts per million (ppm), hydrogen sulfide can cause nausea and headaches. At higher concentrations, 500 to 2,000 ppm, hydrogen sulfide may cause paralysis and death. At lower concentrations, however, the chemical is relatively harmless and is characterized by an odor similar to rotten eggs. When brought into contact with oxygen, in either air or water, the substance rapidly breaks down to non-toxic components. Methane gas can create a fire hazard if ignition sources are present during excavation activities and if concentrations are sufficiently high (that is, between 5 and 15 percent). The presence of methane gas could also present a health concern for workers during trenching work if the work space is not adequately ventilated.

Anderson & Middleton Alternative Site

One small office building located at the northern property boundary at the Anderson & Middleton Alternative site may be demolished during project construction. The building is

not expected to contain asbestos because the building appeared to have been constructed between 1981 and 1990, after most of the asbestos-containing materials had been banned for use in building construction.

The sediment samples collected from the proposed dredged area did not exceed the DMMP screening levels for the Anderson & Middleton site. Based on the reconnaissance sampling results, the dredged material from the Anderson & Middleton site appears to be suitable for unconfined open-water disposal and may not require additional handling and upland disposal. Additional sampling may be required to meet the minimum number of samples required by the Dredge Material Management Office (DMMO) to fully characterize the proposed dredge area. However, the risk of encountering contaminated sediment that may require special handling and upland disposal is considered low based on the reconnaissance sampling results.

Aberdeen Log Yard Property

No structures exist at the Aberdeen Log Yard Alternative site.

DMMP sediment screening levels for DDT and dioxins/furans were slightly exceeded for selected surface and subsurface sediment samples and locations at the Aberdeen Log Yard Alternative site. Further chemical testing will be needed to confirm the observed exceedances in the sediment dredge material management units where the exceedances were initially identified. If further chemical testing confirms the prior exceedances, bioaccumulation and toxicity testing will need to be performed to further assess whether this material would require additional handling and disposal such as at a non-hazardous-waste upland landfill instead of unconfined open water disposal.

Based on the detected concentrations identified in this reconnaissance sampling, the dredge material where screening levels were exceeded may be suitable for disposal in a non-hazardous-waste landfill.

No Build Alternative

Contaminated media would not be encountered under the No Build Alternative, because no construction activities would be conducted.

How would operation of the project affect hazardous materials?

Operational effects relating to hazardous and waste materials that could occur during construction of the pontoons would be associated with buildup of methane gas and runoff of contaminants entrained in storm water.

Contaminants likely to be in storm water runoff include fuel, lubricants, heavy metal compounds from tires and brakes, and automobile engine coolants such as ethylene glycol. Storm-water facilities would be designed to collect runoff from project traffic. In addition, high-pH (alkaline) water would be generated as part of the concrete production process (concrete batch plant) as well as from storm water runoff that comes into contact with raw material, intermediate product, product, byproducts, or waste used in or resulting from the

pontoon manufacturing process. Wastewater treatment facilities would be designed to collect storm water runoff from affected areas.

Maintenance dredging of the launch channel may be necessary during construction of the pontoons. Contaminated dredge material, if present, would be characterized and disposed of similarly to the disposal methods discussed above under construction effects.

Grays Harbor Build Alternatives

Contaminants in storm water runoff during project operation would be controlled by the installation of a storm water treatment facility at the project site. The treatment facility would capture any storm water runoff and treat the water to remove contaminants before discharge to Grays Harbor. Storm-water treatment might include oil/water separation, sedimentation, media filtration, and/or chemical flocculation.

The areas of buried sawdust and wood debris could be expected to undergo long-term settlement after site development and result in differential settlement for any utilities or other near-surface features constructed at the site. These zones are also a potential source of methane gas due to the continuing decay of the wood debris. Following construction, vaults, catch basins, encasement pipe, and other underground openings have the potential to accumulate significant concentrations of methane gas. These accumulations could exceed the lower explosive limit (LEL) and create an explosion hazard. Backfilled trenches could act as gas conduits and allow transmission of gas to unexpected places. The gas issue could be more critical in paved areas or other areas where construction creates a confining layer that does not allow the dissipation of any accumulated gases.

No Build Alternative

No operational effects relating to hazardous materials would occur under the No Build Alternative because pontoon construction would not take place.

How would the project affect hazardous materials in the long term?

Long-term effects include environmental effects from the new casting basin and ancillary facilities remaining in place after pontoon production was completed, effects associated with pontoon moorage over an indefinite period, and effects associated with mitigation efforts that would remain after the project was terminated.

Grays Harbor Build Alternatives

A positive long-term effect resulting from project development would be the planned new onsite storm water treatment and detention facilities. These would minimize the project's contribution to adverse effects on water resources and, after the project was terminated, would continue to provide treatment for storm water runoff from the constructed impervious surfaces.

Either Grays Harbor build alternative would have a positive long-term effect relating to hazardous materials by removing potentially contaminated soil and sediment during

excavation of the pontoon launch channel. Contaminated soils and sediments would be placed in trucks, barges, or railcars and disposed offsite at a permitted facility such as a non-hazardous-waste landfill.

Dewatering activities would also result in a positive long-term effect relating to hazardous materials by discharging groundwater to nearby surface water only after the water is treated. Contaminated groundwater would be treated onsite or processed offsite at a nearby wastewater treatment facility. Treatment and disposal of contaminated groundwater would result in some groundwater remediation at the site.

4. Mitigation

How does WSDOT avoid or minimize negative impacts?

Standard hazardous materials impacts and potential mitigation measures are presented in Attachment F and described below.

Environmental Mitigation Measures

Grays Harbor Build Alternatives

Because the Chehalis River and Grays Harbor are adjacent to the build alternative sites, these water bodies require protection against spills or releases of hazardous materials. WSDOT's Standard Specification #1-07.15(1) limits the use, transfer, and storage of hazardous materials in sensitive areas (WSDOT 2009f). WSDOT must prepare a project-specific Spill Prevention, Control, and Countermeasures (SPCC) plan before any construction activities commence. The SPCC plan is designed to mitigate impacts to soil, surface water, and groundwater. It addresses procedures, equipment, and materials to employ should a spill of contaminated soil, petroleum products, contaminated water, or other hazardous substances occur.

No Build Alternative

No negative effects relating to hazardous materials would occur with the No Build Alternative, and no mitigation measures would be needed.

Construction Mitigation Measures

Standard mitigation measures for construction impacts such as encountering contaminated soil and groundwater, underground storage tanks, or accidental spills, along with measures to address other worker safety and public health issues, are presented in Attachment F.

Grays Harbor Build Alternatives

The likelihood of encountering contaminated media at either build alternative site is considered low because of past remediation and the results of recent soil and groundwater sampling conducted during the Phase II ESA investigation (see Attachment A) and the Supplemental Soil and Groundwater Investigation (Attachment B). Localized areas of soil and groundwater contamination were identified at both sites. If localized areas of contaminated soil and/or groundwater were encountered during project construction, mitigation measures would include management and disposal of contaminated media in

accordance with applicable regulations and implementation of construction techniques that minimize disturbance to the subsurface.

To address the worker health and safety concerns posed by encountering hydrogen sulfide and methane gas during excavation activities, a comprehensive health and safety plan should be developed for the construction project that includes procedures for monitoring vapor releases and to prevent fires from potential methane ignition. In addition, procedures should be put in place to provide adequate ventilation, particularly during construction activities involving confined spaces or trenching work.

To address the potential presence of methane gas during operation, specific design measures may be required to limit the migration of methane gas on the site and to provide appropriate ventilation to keep the buildup of methane gas to levels below their explosive limit.

The likelihood of encountering contaminated sediment that requires additional handling and disposal is low at the Anderson & Middleton site. At the Aberdeen Log Yard site, the likelihood of encountering contaminated sediment that requires additional handling and disposal is moderate. Dredged sediment material exceeded the screening level defined in the DMMP. Subsequent testing may be needed to determine whether sediments must be disposed in a permitted landfill due to contamination. Mitigation measures would include management and disposal of contaminated sediment in accordance with applicable regulations and implementation of construction techniques that minimize disturbance or release of contaminants into the aquatic environment.

Best management practices (BMPs) will be implemented during dredging of the launch channel and will be designed to minimize the loss or transport of contaminated sediment or debris from the dredging footprint and minimize the generation and runoff of leachate from dredged material to the receiving water during transport or rehandling of dredged sediments. The BMPs will be selected based on dredging methods, transport equipment used, the process “train” or sequencing of the activities, and actual field conditions.

How could the project compensate for unavoidable negative impacts?

No significant unavoidable negative impacts have been identified with any of the alternatives.

What are the preliminary estimates of the proposed negative impacts?

Contaminated Soil and Groundwater

The cost estimates presented in Exhibit 9 are for soil and groundwater disposal only. They do not include the costs of excavating and transporting materials to the necessary disposal/treatment facility, which can be substantial. They also do not include the cost of soil or groundwater characterization prior to disposal.

EXHIBIT 9

Estimated Costs for Soil and Groundwater Treatment and Disposal

Treatment/Disposal	Cost
Petroleum-contaminated soil – thermal treatment or landfill disposal	\$30 to \$40 per ton
Halogenated solvent-, EPA priority pollutant-, and/or corrosive waste-contaminated soils – landfill disposal, dangerous waste	\$180 per ton
Permitting for local discharges of contaminated groundwater (depending on type and level of contaminants present)	\$2,500 to \$10,000
Onsite treatment and disposal of contaminated groundwater (depending on type and level of contaminants present)	\$0.00 to \$1.5 million
Yearly long-term operation of onsite treatment and disposal of contaminated groundwater	\$0.00 to \$250,000
Contaminated sediment – upland disposal at non-hazardous-waste landfill	\$45 per ton

Unit rates for soil management have been estimated for offsite treatment or offsite disposal based on the assumption that non-hazardous contaminated soil, if encountered, would be transported to a thermal treatment facility located in western Washington. Non-hazardous contaminated soil that cannot be disposed of at a thermal facility (for example, soil contaminated with metals) would require disposal at a regional landfill. The disposal costs for regulated hazardous waste are considerably more expensive than for non-regulated contaminated soil. The costs would differ substantially depending on the specific characteristics of the soil and the level of contamination.

Unit rates for groundwater management have been estimated for onsite treatment. These estimates are based on the assumption that contaminated groundwater (from dewatering operation) would be treated onsite using a passive filtration system to treat copper before discharge to Grays Harbor. The estimated groundwater treatment costs anticipated during project construction range from \$0 (should WSDOT be permitted to discharge untreated groundwater to surface water) to \$1.5 million. Costs can increase depending upon the characterization of the water and the levels of contamination present. The unit costs assume typical conditions and therefore represent a “most likely” estimate for treatment and/or disposal. These estimates do not include costs for sediment control and pH adjustment (if needed) of the dewatering water, because this cost would be incurred regardless of whether the groundwater was contaminated. Groundwater treatment and disposal may be needed during long-term operation of the facility since dewatering may continue during operation.

Contaminated Sediment

Dredged sediment, if found to be unsuitable for unconfined open water disposal due to chemical contamination, would be disposed of in an upland permitted landfill. The unit rate for disposal of contaminated sediment is presented in Exhibit 9. The cost does not include the costs of excavating and transporting materials to the necessary disposal/treatment facility,

which can be substantial. They also do not include the cost of sediment characterization prior to disposal.

Spill Prevention, Control, and Countermeasures Plan

SPCC plans are developed for specific construction projects. Plans typically vary in cost from \$500 to \$5,000 depending on the project size and location. Because of the project's proximity to sensitive areas (the Chehalis and Hoquiam rivers and Grays Harbor), the estimated cost to develop the SPCC Plan might be closer to \$5,000. Plan implementation costs would depend on diligence in avoiding spills. If care is taken to prevent spills, the plan implementation costs should be less than \$25,000.

5. Recommendations and Cost Estimates for Further Investigation

What data gaps or additional investigations were identified?

The test results from recent soil and groundwater sampling at the build alternative sites indicate that concentrations of contaminants are below MTCA cleanup levels with a few exceptions. Evidence of contamination was observed in one area at the Anderson and Middleton site and in three at the Aberdeen Log Yard site. However, these contaminated areas are believed to be relatively localized. No further investigation is recommended.

As part of the dredging permit requirements, a dredge material evaluation would be conducted in accordance with the requirements outlined in the U.S. Army Corps of Engineers' *Dredged Material Evaluation and Disposal Procedures (Users' Manual)* (USACE 2008). The results of the dredge material evaluation would enable the project to better define the potential cost associated with the handling and disposal of contaminated sediments.

What are the potential costs for recommended additional investigations?

The potential costs for conducting a dredged material evaluation in accordance with the requirements of the Dredged Material Evaluation and Disposal Procedures are in the range of \$100,000 to \$750,000.

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