OFF-PROPERTY PORTION INTERIM ACTION WORK PLAN

FORMER PACIFIC WOOD TREATING CO. SITE
FACILITY ID 1019, CLEANUP SITE ID 3020

Prepared for

PORT OF RIDGEFIELD

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The material and data in this work plan were prepared under the supervision and direction of the undersigned.

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BMP	best management practice
the City	City of Ridgefield
CRZ	critical root zone
CUL	cleanup level
DCA	disproportionate-cost analysis
dioxins	chlorinated dibenzo-p-dioxins and dibenzofurans
Ecology	Washington State Department of Ecology
FS	feasibility study
IAWP	interim action work plan
ISM	incremental sampling methodology
LA	landscape architect
LRIS	Lake River Industrial Site
MFA	Maul Foster & Alongi, Inc.
MTCA	Model Toxics Control Act
ng/kg	nanograms per kilogram
NGVD	National Geodetic Vertical Datum of 1927/1947
OPP	off-property portion
the Order	Agreed Order No. DE 11057 between the Port and Ecology
OSHA	Occupational Safety and Health Act
PAH	polycyclic aromatic hydrocarbon
PCP	pentachlorophenol
POC	point of compliance
the Port	Port of Ridgefield
PWT	Pacific Wood Treating Co.
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RI	remedial investigation
ROW	right-of-way
SAP	sampling and analysis plan
the site	former PWT site
TEE	terrestrial ecological evaluation
TEF	toxicity equivalency factor
TEQ	toxicity equivalent
TOC	total organic carbon
WAC	Washington Administrative Code

1 INTRODUCTION

On behalf of the Port of Ridgefield (the Port), Maul Foster & Alongi, Inc. (MFA) has prepared this interim action work plan (IAWP) for soil removal and restoration in impacted areas of the off-property portion (OPP) of the former Pacific Wood Treating Co. (PWT) site (the site) in Ridgefield, Washington. The OPP adjoins the Port's Millers' Landing, formerly known as the Lake River Industrial Site (LRIS) (see Figure 1-1).

This IAWP fulfills the requirements of Washington Administrative Code (WAC) 173-340-430(7). One requirement is that, except in certain circumstances, a plan be prepared before an interim action is conducted under the Model Toxics Control Act (MTCA). This IWAP was prepared under the authority of Agreed Order No. DE 11057 (the Order) between the Port and the Washington State Department of Ecology (Ecology) to address areas of known soil contamination in residential yards and adjacent rights-of-way (ROWs) in the OPP.

1.1 Definition of Site and Off-Property Portion

The site is located at and near 111 West Division Street in Ridgefield, Washington (see Figure 1-2). PWT operated a wood-treating facility at the LRIS from 1964 to 1993. These operations resulted in the release of hazardous substances, including chlorinated dibenzo-p-dioxins and dibenzofurans (dioxins). The site is defined by the extent of contamination caused by the release of hazardous substances from the former wood-treating operations. The site constitutes a "Facility" under Revised Code of Washington (RCW) 70.105D.020(4). The areas addressed by previous site investigations and remedial actions include the LRIS, Port-owned properties, and nearby water bodies (Carty Lake and Lake River), pursuant to the 2013 Consent Decree (Ecology, 2013b).

The OPP refers to the portion of the site where further investigation was required under the Order. The OPP includes the ROWs and residential properties shown in Figure 1-2, and may be expanded, depending on the results of additional investigations.

1.2 Purpose

The purpose of this IAWP is to describe interim action for soil in residential properties and adjacent ROWs that is known to exceed the MTCA Method B cleanup level (CUL) for the dioxin toxicity equivalent (TEQ) of 13 nanograms per kilogram (ng/kg). The proposed interim action includes removal of contaminated soil and is technically necessary to reduce threats to human health and the environment.

1.3 Regulatory Framework

According to WAC 173-340-430, an interim action is distinguished from a final cleanup action in that an interim action only partially addresses the cleanup of a site. The interim action will not achieve final cleanup of the entire OPP. However, the interim action will achieve final cleanup for areas where

2015-2016 remedial investigation (RI) activities show soils exceeding the CUL in yards and in ROWs east of Railroad Avenue and west of Main Avenue (the area delineated in Figure 1-2). Consistent with Ecology's preference for permanent cleanup, the interim action includes removal of contaminated soils. Cleanup at other yards and ROWs that have not yet been characterized may be conducted in the future, if necessary and as determined by the RI in progress.

The proposed interim action qualifies under WAC 173-340-430(1)(a), which defines one category of interim action as "a remedial action that is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance at a facility." This interim action will remediate soils in areas known to exceed the soil CUL and will eliminate potential for exposure in these areas.

Additional requirements of an interim action, as stated in WAC 173-340-430(3), are that it will be consistent with, and shall not exclude reasonable alternatives for, the cleanup action. Because some properties that have been identified for investigation have not yet been sampled and the final cleanup action has not yet been decided on, a cleanup action plan cannot be written at this time. This interim action is anticipated to be the final remedy in the areas in which it is implemented, and will not preclude the MTCA evaluation of alternatives and selection of a final cleanup for the entire OPP.

2 BACKGROUND

2.1 Former Pacific Wood Treating Co. Site History

The OPP is east and upgradient of the LRIS. Figure 1-2 shows the OPP and vicinity, including the Port-owned, approximately 40-acre LRIS. PWT leased the LRIS from 1964 to 1993. PWT's operations involved pressure-treating wood products with oil-based treatment solutions containing creosote, pentachlorophenol (PCP), and water-based mixtures of copper, chromium, arsenic, and/or zinc. Potential release and transport mechanisms are described in the 2013 site RI/feasibility study (FS) report (MFA, 2013b). PWT filed for bankruptcy in 1993 and abandoned the LRIS. The Port established office spaces on the LRIS and manages the Millers' Landing property. Multiple upland and in-water cleanup actions have been conducted, consistent with the 2013 partial Consent Decree (Ecology, 2013b), including a full soil cap on the Port's Railroad Avenue properties directly west of the OPP (Figure 1-2).

2.2 Off-Property Setting

The OPP is located in section 24, township 4 north, range 1 west, Willamette Meridian. The OPP includes 48 tax lots (according to the Clark County Maps Online database) and associated ROWs (see Figure 2-1). A database providing tax-lot-specific information is presented in Appendix A. Future RI activities likely will include yards and ROWs east of Main Avenue and south of Mill Street.

The OPP is currently zoned low-density residential (the area is zoned primarily for 5,000-square-foot lots or larger). Primary land use is expected to remain residential. The areas to the north and east of the OPP, including a park, are also zoned residential. Nonresidential zoning designations (waterfront-mixed use) apply to the Union Pacific railroad tracks, the Port-owned Railroad Avenue properties, and Millers' Landing to the west. Similarly, areas south of Mill Street are zoned mixed-use. There is substantial development in the OPP, with minimal remaining viable ecological habitat.

Groundwater in the vicinity of the OPP is not used for drinking. Drinking water is provided by the City of Ridgefield (the City), i.e., municipal water supply. Based on the Clark County Maps Online database, no domestic drinking water wells were identified in the OPP. The closest domestic drinking water wells belong to the City. These wells are located approximately 2,500 feet (0.5 mile) upgradient of the OPP, in Abrams Park. Mr. Steven Wall, PE, the City's former public works director, stated that, in the future, water wells will not be installed west of Abrams Park, in the direction of the OPP (Wall, 2006). If additional water needs arise, beyond the installation of additional wells at Abrams Park and/or the I-5 junction, the City will install wells east of I-5.

2.2.1 Topography

The OPP is relatively flat, with a slight downward slope from east to west. The elevation ranges from approximately 78 feet National Geodetic Vertical Datum of 1927/1947 (NGVD) at the eastern extent to approximately 50 feet NGVD at the western extent.

2.2.2 Area Geology

Four principal geologic units have been identified at the nearby Millers' Landing (MFA, 2013b): fill, younger alluvium, older alluvium, and the upper Troutdale Formation. The younger alluvium (clayey silts, sandy silts, and sands) appears to be thicker to the west near Lake River, and the older alluvium (sandy gravel) appears to be thicker to the east. The silty gravel observed beneath the alluvium may represent the top of the Troutdale Formation and forms an aquitard. Note that Millers' Landing is west of the OPP and is approximately 25 to 50 feet lower in elevation.

OPP soils are classified as Hillsboro silt loam and are well-drained. Soil samples collected in residential yards during the course of the 2015-2016 RI activities generally indicate a sand with silt layer from approximately 0 to 1 foot below ground surface (bgs). In ROWs, sand with silt or gravel with sand/silt is present from approximately 0 to 2 feet bgs. Six deeper soil borings, from 0 to 10 feet bgs, were collected in ROWs in September 2012. These borings generally indicated gravel with sand fill layer or gravel with silt from approximately 0 to 1 foot bgs, sand and/or silts from approximately 1 to 8 feet bgs, and sand from approximately 8 to 10 feet bgs (MFA, 2013a).

2.3 Previous Investigations

Multiple investigations have been conducted since 1985 to characterize the impacts associated with historical PWT operations; these investigations are summarized in the site RI/FS (MFA, 2013b). Previous investigations conducted on the OPP demonstrate that potential hazardous substances in the OPP are limited to dioxins (for evaluation of human health), and no adverse effects to ecological receptors are expected. These investigations are described below.

Surface soil samples (approximately 0 to 0.5 foot bgs) were initially collected at 16 locations in OPP ROWs and in adjacent residential area ROWs. Analyses were conducted for chemicals known to have impacted LRIS soils, including polycyclic aromatic hydrocarbons (PAHs), PCP, arsenic, chromium, copper, zinc, and dioxins (MFA, 2010). Subsequently, ten additional surface soil samples were collected (MFA, 2011). Finally, composite soil sampling (0 to 6 feet bgs) was conducted at six ROW locations in September 2012 to further support evaluation of potential risks to terrestrial ecological receptors (MFA, 2013a). The data from these previous investigations are shown in Table 2-1, with sample locations and results shown in Figure 2-2.

Based on these data, evaluations (presented in the RI work plan [MFA, 2015]) were conducted to identify potential hazardous substances in the OPP that may pose a threat to human health or the environment. The data were compared with MTCA Method A and B soil CULs protective of human health (WAC 173-340-705), and no chemicals, except dioxins, exceeded the applicable CULs. Dioxins (measured as the TEQ) were detected above the soil CUL of 13 ng/kg in portions of the OPP. Dioxins were therefore identified for further investigation as substances potentially hazardous to human health.

No hazardous substances that may pose a threat to the environment were identified. A terrestrial ecological evaluation (TEE) showed that PAHs, PCP, and metals should not be expected to result in adverse effects (MFA, 2012). A supplementary TEE demonstrated that dioxins in OPP soil samples representative of potential exposure are below ecological indicator concentrations (MFA, 2013a). In February 2013, Ecology approved the supplementary TEE showing no unacceptable risk to ecological receptors (Ecology, 2013a).

2.4 2015-2016 Remedial Investigation

Beginning in spring 2015, the RI was conducted in the residential yards and ROWs (see Figure 2-3). The purpose of this RI was to generate sufficient data to adequately characterize the nature and extent of soil impacts and to evaluate the risk to human health from releases of dioxins that may be associated with former PWT operations. Public outreach (e.g., home visits and acquisition of access agreements) and sampling were conducted consistent with the Ecology-approved RI work plan and sampling and analysis plan (SAP) (MFA, 2015). Site-specific SAPs that identify sample locations specific to each yard and ROW were developed and approved by Ecology prior to sampling activities. Modified incremental sampling methodology (ISM) or composite surface soil samples were collected in yards to characterize the average dioxin TEQ soil concentrations. ISM is a structured composite sampling and processing protocol that reduces data variability and increases the probability of identifying areas of elevated concentrations, thereby increasing data representativeness. Ten ISM increments (soil plugs) were typically collected in a yard sampling area; the sampling areas included exposed lawn/soil that was not significantly disturbed, as determined by site visits and information provided by owners. Disturbed areas included areas of imported soil (e.g., garden beds), debris/wood piles, burn areas, and areas of recent digging. In some yards, two ISM samples were collected because of the large size of the yard or significant differences between parts of the yard (e.g., between the front and back yards). Replicate ISM samples were collected in several yards to verify that sampling and analysis procedures consistently reflected soil concentrations. In addition, discrete subsurface soil samples were collected in yards to inform vertical extent. In ROWs, discrete surface and subsurface samples were collected to characterize the lateral and vertical extent of impacts.

The sampling results were evaluated in the context of potential exposure pathways and the dioxin soil CUL to determine areas with potential for unacceptable risk. Samples were transported under chain-of custody procedures to the analytical laboratory for analysis. Data results were reviewed for usability and were qualified consistent with U.S. Environmental Protection Agency procedures and appropriate laboratory and method-specific guidelines. The laboratory data and data quality review memoranda are provided in Appendix B. All validated analytical data will be uploaded to Ecology's Environmental Information System database.

Consistent with WAC 173-340-708(8), mixtures of dioxins are considered a single hazardous substance in the evaluation of compliance with CULs. Dioxin toxicity is assessed using a toxicity equivalency approach. Each congener in the group is assigned a toxicity equivalency factor (TEF) (based on a consensus-based list of TEFs for mammal receptors [Van den Berg et al., 2006]) that describes the toxicity of a congener relative to the most toxic compound, 2,3,7,8-tetrachloro dibenzo-p-dioxin. This approach permits expression of all congener concentrations in terms of a total dioxin TEQ. The yard and ROW dioxin TEQ results are summarized below.

2.4.1 Yards

Table 2-2 presents dioxin congener and dioxin TEQ results for the yard samples. Surface soils (0 to 0.5 foot bgs) in multiple properties are above the CUL (see Figure 2-4). Concentrations are highest along Division Street near Railroad Avenue. Concentrations generally decrease to below or near the CUL along the northern, eastern, and southern OPP areas. The replicate ISM concentrations are highly consistent, showing that the modified ISM sampling approach adequately characterized the average concentrations in yards. Total organic carbon (TOC) was measured to confirm that soil samples reflect typical levels. TOC in yards ranges from 0.75 to 2.6 percent (average equal to 1.7 percent), which is within the range (approximately 0.5 to 5 percent) for normal soils.

The vertical extent of impacts in yards is generally limited to the surface. Subsurface (0.5 to 1 foot bgs) concentrations are below the soil CUL, with the exception of samples at properties 005 and 006 along Division Street near Railroad Avenue (see Figure 2-4). The elevated subsurface results correspond with elevated surface concentrations (i.e., approximately 40 ng/kg dioxin TEQ or above). Subsurface concentrations in multiple yards with lower surface concentrations (i.e., approximately 40 ng/kg dioxin TEQ or below) are below the CUL. Yard concentrations are further discussed in the context of the interim action (see Section 4.1.1).

2.4.2 Rights-of-Way

Table 2-3 presents dioxin congener and dioxin TEQ results for surface and subsurface ROW samples collected in 2015. The results show that soil concentrations exceed the soil CUL in portions of the OPP ROWs (see Figure 2-5). TOC ranged from 0.38 to 2.4 percent, and average TOC (1.4 percent) is within the normal range for typical soils.

Surface soils (0 to 0.5 foot bgs) along the northern OPP boundary are below the CUL. Concentrations above the CUL are present in other portions of the OPP and are highest along Division Street near Railroad Avenue, consistent with the results observed in yards.

Dioxin concentrations are generally highest in the surface (0 to 0.5 foot bgs), with decreasing concentrations observed in the subsurface. The vertical extent of impacts to ROWs has been delineated; all samples collected from 1.5 to 2.0 feet bgs are below the CUL, showing that the maximum vertical extent of impacts is approximately 1.5 feet bgs, with impacts typically limited to the top 1 foot (see Figure 2-5). ROW concentrations are further discussed in the context of the interim action (see Section 4.1.2).

2.5 Public Participation

A public participation plan prepared by Ecology describes the tools Ecology has used and will continue to use to inform the public (Ecology, 2014). The plan is intended to address concerns from individuals, community groups, local governments, tribes, federal and state agencies, and any other organization that may have an interest in or knowledge of the OPP.

Ecology and the Port have addressed community concerns throughout the OPP RI activities, and will continue coordination to ensure that future project activities account for community input. Ecology provided public notice, distributed fact sheets, and solicited comments prior to and during the RI. Ecology and the Port held a public community meeting and conducted site visits to properties prior to sampling. These efforts ensured that tenants and owners were aware of project activities and provided residents multiple opportunities to ask questions and voice concerns. Solicitation of comments will continue at important stages of the project, such as the submission of engineering design reports and the cleanup action plan. Ecology shall maintain the responsibility for public participation, and the Port shall cooperate with Ecology. Common community concerns include noise and traffic, short- and long-term risks, socioeconomic impacts, potential yard cleanup/modifications, and the time frame of any proposed activities.

The Port will continue to notify Ecology before the preparation of all press releases and fact sheets, and before major meetings with the interested public and local governments. Similarly, Ecology shall notify the Port before issuing any press releases and fact sheets, and before major meetings with the interested public and local governments. For all press releases, fact sheets, meetings, and other outreach efforts by the Port that do not receive prior Ecology approval, the Port shall clearly indicate to its audience that the press release, fact sheet, meeting, or other outreach effort was not sponsored or endorsed by Ecology. When requested by Ecology, the Port or its representatives shall participate in public presentations on the progress of the project activities. Participation may be through attendance at public meetings to assist in answering questions or as a presenter.

2.6 Cleanup Levels and Points of Compliance

A soil CUL is the concentration of a hazardous substance in soil that is determined to be protective of human health and the environment under specified exposure conditions. CULs, in combination with points of compliance (POCs), typically define a site's area or volume of media that must be addressed by a cleanup action (WAC 173-340-700 through 173-340-760). A cleanup standard takes into account the CUL and the POC and incorporates other state and federal regulatory requirements applicable to the cleanup action and/or its location.

MTCA includes procedures for developing standard and modified Method B CULs for media (WAC 173-340-700). Default assumptions are used in calculating the unrestricted land use standard MTCA Method B CUL. An unrestricted land use CUL is appropriate because the OPP properties are residential.

The standard unrestricted land use MTCA Method B level of 13 ng/kg for 2,3,7,8-tetrachloro dibenzo-p-dioxin is protective of persons ingesting dioxins in soil and dust particles and is selected as the soil CUL. The soil CUL is based on exposure assumptions protective of children; these assumptions include, but are not limited to, an exposure duration of six years, a soil ingestion/dust inhalation rate of 200 milligrams per day, and an average body weight of 16 kilograms over the exposure duration (WAC 173-340-740). The CUL integrates an acceptable excess cancer risk level of 1 in 1 million for carcinogenic chemicals such as dioxins. This means that exposure to dioxins at or below 13 ng/kg dioxin TEQ is an acceptable level, whereas exposure to concentrations above 13 ng/kg dioxin TEQ results in an unacceptable increased cancer risk. The dioxin TEQ incorporates toxicity associated with the 17 dioxin congeners and is calculated and compared with the CUL to determine whether soil concentrations may result in unacceptable risk.

The POC is the depth in the affected medium (soil) at which the CUL must be met. The POC for human exposure via direct contact is 0 to 15 feet bgs for soil (WAC 173-340-740 (6)(d)). Consistent with MTCA, it is assumed that 15 feet is the depth of soil that could be excavated and distributed at the soil surface during development work.

3 INTERIM ACTION ALTERNATIVES

Interim action alternatives that protect human health by eliminating, reducing, or otherwise controlling risks are evaluated in this section, consistent with procedures provided in WAC 173-340-350(8) and WAC 173-340-355. As described in Section 1.3, the interim action will not achieve final cleanup of the entire OPP; however, individual residential properties and ROWs described in this IAWP will receive final cleanup actions. Therefore, regulatory statutes that apply to both interim and final cleanup actions are applicable and cleanup must meet requirements specified in WAC 173-340-360. Current or potential future residential area soils with hazardous-substance concentrations that exceed soil CULs must be treated, removed, or contained. A property qualifies as a current or potential residential area if:

- The property is currently used for residential purposes; or
- The property has a potential to serve as a future residential area, based on the consideration of zoning, statutory and regulatory restrictions, comprehensive plans, historical use, adjacent land uses, and other relevant factors.

Based on existing and likely future land use, all properties in the OPP qualify as a residential area. Therefore, only alternatives that specify treatment, removal, or containment of soil are evaluated.

3.1 Technology Screen

Consistent with WAC 173-340-350(8)(b)—Screening of Alternatives, individual cleanup action components (technologies) were reviewed and screened to identify applicable methods for remediating the soil on private properties and in the ROWs. A preliminary screening of applicable technologies was completed, based on technologies discussed in the Federal Remediation Technologies Roundtable screening matrix (FRTR, 2008), as well as on other commonly used remediation methods. Effectiveness and implementability of the technologies were assessed for the dioxin contamination in soil in residential neighborhoods, resulting in a single appropriate technology—removal and off-site disposal. This approach was discussed with and agreed to by Ecology at a meeting on July 29, 2015.

3.2 Alternatives

The interim action alternative for the OPP was developed using the individual cleanup technologies identified through the technology screening process discussed in Appendix C, taking into consideration the soil CUL presented in Section 2.6. The development of interim action alternatives involves combining various remedial technologies into a comprehensive approach that accomplishes the interim action goals. However, as described above, a single appropriate technology—removal and off-site disposal—was readily identified.

3.2.1 Alternative 1: No Action

This alternative was not selected and is not further evaluated because the soil CUL of 13 ng/kg dioxin TEQ would be exceeded.

3.2.2 Alternative 2: Soil Removal and Restoration

The primary components of the alternative are:

- Removal of soil to the CUL in yards and ROWs
- Restoration of yards and ROWs

Removed soil would be replaced with clean soil or, in the case of ROWs, crushed surfacing. Excavated soil would be transported by truck and disposed of as nonhazardous material at a Subtitle D landfill facility. Yard and ROW landscaping will be restored.

3.3 Alternative Analysis

This section describes the MTCA process by which the preferred interim action alternative for the OPP was selected. The MTCA requirements are used as the criteria for evaluating cleanup action alternatives. While only one feasible alternative was identified and no formal alternative analysis was conducted, the selected interim action must meet the minimum threshold requirements pursuant to WAC 173-340-360 and described below. The following sections describe how the selected alternative meets these MTCA requirements.

3.3.1 Threshold Requirements

The interim action must meet the MTCA threshold requirements (WAC 173-340-360(2)(a)), which include the following:

- Protection of human health and the environment
- Compliance with cleanup standards
- Compliance with applicable state and federal laws
- Provision for compliance monitoring

3.3.1.1 Protection of Human Health and the Environment

The single appropriate technology (removal and restoration) is protective of human health and the environment. This alternative involves removal of impacted soil in areas with dioxin concentrations above the CUL and replacing it with clean soil. Through excavation, direct and indirect contact and exposure would be prevented for the long term.

3.3.1.2 Compliance with Cleanup Standards

This interim action is being conducted under MTCA (WAC 173-340).

3.3.1.3 Compliance with Applicable State and Federal Laws

The interim action will be conducted consistent with applicable state and federal laws, as discussed in Appendix D.

3.3.1.4 Provision for Compliance Monitoring

Compliance monitoring, as required by WAC 173-340-410 and 173-340-740 through 173-340-750, consists of protection monitoring, performance monitoring, and confirmation monitoring to determine short- and long-term safety and effectiveness of the implemented alternative.

Protection monitoring is conducted to confirm that human health and the environment are adequately protected during construction, operation, and maintenance periods. Performance monitoring confirms that the cleanup has attained cleanup standards or other performance standards, including those outlined in any permits. Confirmation monitoring may be included to verify the long-term effectiveness of the interim action and/or final cleanup action.

Protection monitoring would consist of engineering oversight to verify safe material-handling procedures, effective health and safety measures, effective erosion- and sediment-control measures, and dust monitoring. Engineering controls would be applied as necessary to protect residents from exposure and unsafe conditions. Performance monitoring, in the form of confirmation sampling, includes samples collected as part of the RI sampling effort. These analytical data are used to set the vertical extents of the excavations prior to construction; a topographic survey of each property will be conducted following excavation and prior to backfill to verify that the soil above the CUL has been removed. Additional monitoring may be conducted consistent with sampling procedures provided in the SAP (MFA, 2015) to refine vertical extent or, at properties where it is infeasible to remove portions of soil (e.g., along steep slopes), to verify that the CUL has been met. The combination of this performance monitoring sampling and the post-soil-excavation/preconstruction topographic survey data will serve as confirmation monitoring.

3.3.2 Disproportionate-Cost Analysis

Costs are determined to be disproportionate to benefits if the incremental cost of a more expensive alternative over that of a lower-cost alternative exceeds the incremental degree of benefits achieved by the more expensive alternative. As outlined in WAC 173-340-360(3)(e) and (f), disproportionate-cost analysis (DCA) includes evaluation criteria that are a mix of qualitative and quantitative factors.

As there is only one feasible alternative, a DCA was not performed. However, the sections below illustrate how this alternative meets criteria established by the DCA process, including protectiveness, permanence, long-term effectiveness, management of short-term risks, technical and administrative implementability, and consideration of public concerns.

Protectiveness

Overall protectiveness of human health and the environment includes the degree to which existing risks are reduced, the time required to reduce risk at a site and attain cleanup standards, on-site and off-site risks resulting from implementing the selected alternative, and improvement of the overall quality of the environment. The selected alternative is protective to the acceptable excess cancer risk level of 1 in 1 million standard for unrestricted land use and is protective of ecological receptors, as soil above the CUL will be removed from the site.

Permanence

Permanence is a factor by which the action alternative permanently reduces the toxicity, mobility, or volume of hazardous substances. The adequacy of the alternative in destroying the hazardous substances, the reduction or elimination of hazardous-substance releases and sources of releases, the degree of irreversibility of the waste-treatment process, and the characteristics and quantity of treatment residuals generated are all considered under this criterion.

MTCA states that, when selecting an alternative, preference shall be given to "permanent solutions to the maximum extent practicable." A permanent solution is defined in WAC 173-340-200 as a cleanup action in which the cleanup standards of WAC 173-340-700 through 760 are met without further action being required at the site being cleaned up, or at any other site involved with the cleanup action, other than the approved disposal of any residue from the treatment of hazardous substances.

The selected alternative has a very high level of permanence. Soil exceeding the CUL is removed.

Effectiveness over the Long Term

Long-term effectiveness includes the degree of certainty that the alternative will be successful; the reliability of the alternative for the period of time during which hazardous substances are expected to remain on site at concentrations that exceed CULs; the magnitude of residual risk with the alternative in place; and the effectiveness of controls required to manage treatment residues or remaining wastes.

The selected alternative (removal and restoration) provides excellent long-term effectiveness because soil will be permanently removed, eliminating the area and volume of soils exceeding the CUL.

Management of Short-Term Risks

Management of short-term risks addresses the risk to human health and the environment associated with the alternative during construction and implementation, and the effectiveness of measures that will be taken to manage such risks. Short-term risks to remediation workers, the general public, and the environment are assessed under this criterion. Generally, short-term risks are expected to be linearly related to the amount of material handled, treated, and/or transported/disposed of (e.g., worker injury/cubic yards excavated [equipment failure], public exposure/cubic yards per mile transported [highway accident], release to environment/gallons treated [treatment system upset]).

As an invasive remedial technology, the selected alternative (removal and restoration) rates low for short-term risk. This alternative involves construction to remove impacted soil. This construction will disturb soil, increasing the potential for improper handling during the removal process, and may result in the generation of dust that could transport contamination and lead to inhalation exposure. Most of the construction associated with this alternative will take place in a location immediately adjacent to private homes. Construction equipment can be dangerous if operated improperly or if the public enters work areas. This alternative increases the likelihood of conflicts between the general public and construction activities.

Technical and Administrative Implementability

Technical and administrative implementability addresses the ability to implement the alternative and includes consideration of whether the alternative is technically possible; the availability of necessary off-site facilities, services, and materials; administrative and regulatory requirements; scheduling; size; complexity; monitoring requirements; access for construction operations and monitoring; and integration with existing facility (or locally applicable) operations and other current or potential remedial actions.

The selected alternative is implementable from a technical and administrative standpoint. Compared with less invasive technologies, the selected alternative (removal and restoration) will require more coordination with area property owners to accomplish the remediation work.

Consideration of Public Concerns

Consideration of public concerns addresses concerns from individuals, community groups, local governments, tribes, federal and state agencies, and any other organization that may have an interest in or knowledge of the site and that may have a preferred alternative.

Ecology and the Port have addressed community concerns throughout the history of cleanup work associated with the site. Additional issues or concerns will be considered by Ecology as part of the IAWP public comment period, as stipulated in WAC 173-340-600 and consistent with requirements set forth in WAC 173-340-430(8). Public comments on the project and on this document will be solicited from the community during the formal comment period, following Ecology input. Common community concerns include noise and traffic, short- and long-term risks, and the time frame for any proposed cleanup actions. Community concerns will also be factored into local permit processes, including responding to any City permitting concerns.

The selected alternative likely will include concerns related to required construction activities, noise, disturbances to property owners, and actions related to the disturbance of contaminated soil in yards and ROWs. These and similar concerns were raised during previous construction activities at the site. Construction work on private properties likely will result in a significant degree of concern from those property owners. Such concerns will be managed throughout the project as part of multiple community outreach efforts, including home visits by Ecology and Port contractor staff.

3.3.3 Reasonable Restoration Time Frame

WAC 173-340-360(4) contains guidance for determining reasonable restoration time frames. The following must be taken into consideration: potential risks posed by the site to human health and the environment; the practicability of achieving a shorter restoration time frame; current use of the site, surrounding areas, and associated resources that are, or that may be, affected by releases from the site; likely effectiveness and reliability of institutional controls; ability to control and monitor migration of hazardous substances from the site; toxicity of the hazardous substances at the site; and the natural processes that reduce concentrations of hazardous substances and that have been documented to occur at the site or under similar conditions.

The selected alternative can be executed within a reasonable time frame.

3.3.4 Expectations for Alternatives

WAC 173-340-370 outlines Ecology's expectations for the development and selection of alternatives. Based on the above DCA, the single feasible alternative is likely to ensure compliance with the expectations. Each of the expectation criteria is summarized below:

Treatment of Waste and Hazardous Substances

Ecology generally expects the treatment of liquid wastes, high concentrations of hazardous substances, highly mobile hazardous materials, and discrete areas of hazardous materials that lend themselves to treatment. There are no liquid wastes on the OPP. The concentrations are not especially high and, in fact, generally correspond with less than a 1 in 100,000 excess cancer risk level and are generally less than an order of magnitude above CULs. Further, the contaminants on the OPP are not highly mobile.

The selected alternative complies with Ecology's expectation.

Minimization of Long-Term Management at Small Sites

Ecology also favors the minimization of long-term management for small sites through destruction, detoxification, and/or removal to bring concentrations on site to below CULs.

The selected alternative, removal, requires no long-term management at the site to bring concentrations below CULs; the selected alternative complies with Ecology's expectation.

Use of Engineering Controls at Large Sites

Ecology recognizes the need to use engineering controls, such as containment, for sites where there are large volumes of low-level contamination and where treatment is impractical.

The selected alternative does not include long-term engineering controls; this criterion is not applicable.

Minimize Stormwater Contamination and Off-Site Migration; Control Runoff to Avoid Surface Water Contamination

Ecology also expects that measures will be taken to avoid stormwater contamination and its subsequent migration off site. In addition, contamination of surface water near the OPP should be avoided through the control of runoff and groundwater discharge or migration.

The selected alternative will remove soils exceeding the CUL. The project will employ stormwater best management practices (BMPs) during construction. Because the contaminants have limited mobility, standard construction practices to limit turbid discharges from the site will avoid contamination of surface water.

Minimize Direct Contact and Migration by Consolidating Hazardous Substances

Ecology expects that when hazardous substances remain on site at concentrations that exceed CULs, those hazardous substances will be consolidated to the maximum extent practicable where needed to minimize the potential for direct contact and migration of hazardous substances.

Under the selected alternative, no hazardous substances at concentrations that exceed CULs will remain at those areas remediated as part of the interim action; this criterion is not applicable.

Control Groundwater Discharge or Migration to Avoid Surface Water Contamination

Groundwater is not a consideration for the OPP, as the contamination is surficial and the water table is greatly removed from the contaminated layer.

This criterion is not applicable.

Allow Natural Attenuation

Ecology acknowledges that natural attenuation may be appropriate where criteria are met.

The selected alternative does not rely on natural attenuation or degradation of dioxins; this criterion is not applicable.

No Significantly Greater Overall Threat to Human Health and the Environment as Compared to Other Alternatives

Ecology expects that any cleanup actions chosen with consideration of WAC 173-340-370 will not result in a significantly greater overall threat to human health and the environment than with other alternatives. The selected alternative will minimize threats to human health and the environment.

4 DESCRIPTION OF INTERIM ACTION

The selected interim action alternative is excavation and off-site disposal of soil in yards and ROWs with dioxin TEQ greater than 13 ng/kg. The following sections describe the interim action area, the interim action approach, and associated documentation and schedule.

4.1 Interim Action Areas

Interim action is proposed for the yards and ROWs shown in Figure 4-1. The cleanup areas and depths are based on the results of previous investigations and the RI (see Section 2). Yard and ROW cleanup areas are further described in the following subsections.

4.1.1 Yards

Yards are identified for cleanup, based on dioxin soil concentrations in the surface (0 to 0.5 foot bgs) that exceed the soil CUL. The subsurface samples from most yards sampled show concentrations below the CUL at 0.5 to 1.0 foot bgs; however, a minimum cleanup depth of 1 foot bgs is selected to accommodate construction realities and small-scale topographic changes. This approach ensures that impacted surface soils are removed.

At properties where surface concentrations are more significantly elevated or subsurface results from 0.5 to 1 foot bgs are above the CUL, a greater cleanup depth (i.e., 1.5 feet bgs) is selected.

Yard cleanup depths and the associated rationale are presented in Table 4-1. Cleanup depths are based on subsurface samples collected in a yard or in a nearby yard with similar surface concentrations. In some cases, ROW samples collected in areas similar to nearby yards (e.g., the yard and ROW are contiguous lawn) are also used to inform yard cleanup depths. ROW samples are typically more impacted than samples from adjacent yards. For example, surface concentrations at ROW-013 (266 ng/kg dioxin TEQ) and ROW-014 (352 ng/kg dioxin TEQ) are well above nearby yard concentrations. ROW subsurface samples therefore likely overestimate, rather than underestimate, depth concentrations in nearby yards, providing a conservative surrogate for yard vertical extent. Yard cleanup depths are undetermined for certain properties. Additional sampling will be conducted, as shown in Table 4-1, during design activities to inform the cleanup depths for these yards.

Because of the presence of a large historical burn pit that could represent a significant localized source of dioxins, soil sampling was not conducted at property 020A. Soil samples collected at the adjacent property (020B, owned by the same person) act as a surrogate for 020A. Based on concentrations above the CUL at 0 to 0.5 bgs at 020B, 020A is identified for cleanup to 1 foot bgs.

No cleanup will be conducted at property 033. The property is entirely covered by a triplex structure and is paved, and no exposed soil is present.

Property 023 has not been sampled; efforts to acquire an access agreement for sampling will continue.

4.1.2 Rights-of-Way

ROW interim action areas and depths are based on the ROW soil sample results (see Section 2.4.2). In cases where nearby yard and/or ROW samples exceed the CUL, the ROW interim action areas conservatively include areas where discrete ROW soil samples are marginally below the CUL. For example, the concentration in the surface ROW sample to the west of 029A is 6.6 ng/kg dioxin TEQ. The adjacent yard concentration and ROW sample to the south of 029A are both above the CUL, and cleanup is therefore identified for the entire ROW to the west of 029A.

ROW cleanup depths and the associated rationale are presented in Table 4-2. A 1-foot-deep cleanup was selected for most areas, based on sample results from 0.5 to 1 or 1 to 1.5 feet bgs that are below the CUL. A 1.5-foot-deep cleanup is identified for the west Main Avenue ROW to the south of Ash Street; the ROW sample in this area exceeds the CUL from 1 to 1.5 feet bgs, and ROW samples from more-impacted areas (e.g., along Division Street) show concentrations below the CUL from 1.5 to 2 feet bgs. Similarly, a 1.5-foot-deep cleanup was selected along Division Street near Railroad Avenue; ROW samples from 1.5 to 2 feet bgs are below the CUL, while shallower samples from 0.5 to 1 foot bgs are above the CUL in this area. A 1.5-foot-deep cleanup is selected for the Division Street ROW adjacent to properties 019 and 020B and near property 026, based on the sample results. Note that no sample collected from 1.5 to 2.0 feet bgs exceeds the CUL throughout the neighborhood, providing the basis for a maximum cleanup depth of 1.5 feet bgs.

In the ROW to the west of Railroad Avenue (north of Division Street) and the ROW along property 011 on Division Street, sampling will be conducted during design activities to characterize impacts (see Table 4-2).

Cleanup of ROWs to the east of Main Avenue and south of Mill Street will take place in the future.

4.2 Interim Action Components

The primary interim action components are:

- Soil with dioxin TEQ exceeding 13 ng/kg will be excavated.
- Clean soil will be imported and placed in yards; crushed surfacing will be placed in ROWs. Imported fill will be tested for a suite of contaminants.
- Excavated material will be disposed of as nonhazardous material waste at a Subtitle D landfill facility. The excavated material will not be designated as either a Resource

Conservation and Recovery Act (RCRA)-listed hazardous waste or a RCRA characteristic waste (see Appendix E).

- Yard and ROW landscaping will be restored.

Full cleanup is proposed for the yards and ROWs. All accessible soil that exceeds the CUL will be excavated. Accessible soils are those not covered by permanent structures (such as homes and garages) or asphalt or concrete paving (such as sidewalks, driveways, patios, and parking areas). During cleanup design activities, it may be determined that additional areas will not be cleaned up (e.g., areas that are too difficult or dangerous to reach, such as under structures affixed to houses, under certain decks or sheds, along steep slopes, and adjacent to retaining walls).

Ecology and the Port will work with the property owner to develop a cleanup plan. A minimum of two visits will be scheduled with the owner to:

- Explain the human health risks associated with dioxins above the CUL and the need for cleanup.
- Verify and survey cleanup areas.
- Establish the restoration design.
- Provide information on precleanup activities and owner responsibilities.
- Provide information about the cleanup and restoration timeline.
- Provide information regarding landscape care following yard restoration.

The Port and the property owner will sign a cleanup contract before cleanup is implemented. The cleanup will be designed to constitute a final cleanup action and no institutional controls (e.g., environmental covenants or deed restrictions) will be placed on the properties. Ecology and the Port will oversee the cleanup and Ecology will approve restoration decisions. The cleanup and restoration process is further described in the following subsections.

4.2.1 Cleanup Approach

Prior to cleanup, topographic, public and private utility, and vegetation surveys will be conducted to inform the cleanup design. Property owners will be responsible for removing nonpermanent structures from the yard and the adjacent ROW (e.g., piles of wood, debris, toys, piles of soil, lawn furniture, fire pits, vehicles). Existing fences in areas identified for cleanup typically will be removed to facilitate excavation. Many of the existing fences are in poor condition and may not remain intact following excavation activities. The preservation of existing fences would require that soil be left in and around the fence posts and other structures; therefore, fence posts typically will be removed to attain final cleanup conditions. Further, many of the impacted properties include adjoining fences that could be time-consuming and expensive to preserve. In some cases, fence panels in good condition will be reused if requested by the homeowner.

Existing small shrubs, groundcovers, and lawns that are in areas identified for cleanup will be removed or transplanted to facilitate soil excavation. Existing large woody vegetation (trees and large shrubs, herein referred to as trees) will be handled on a case-by-case basis. If preservation of the tree is desired, trees will be surveyed by a certified arborist; this survey effort will include delineation of the critical root zone (CRZ) and an evaluation of the health/viability of individual trees. Where practicable and if desired by the homeowner, existing, viable trees will be preserved during construction by the following practices:

- Delineation of the CRZ by construction fencing
- Prohibition of construction equipment entry into and transit within the CRZ
- Hand and/or vactor truck excavation of soil in the CRZ
- Restoration of soil near roots (following excavation and survey of post-excavation grade)
- Informing the homeowner of any soil within the cleanup horizon that may have to remain to preserve the tree
- Covering clean fill soil around the tree with mulch
- Additional precautions as recommended by the project arborist

Trees that are identified as unhealthy/inviable will be removed before soil excavation and may be replaced with a nursery-stock tree as part of the landscape restoration. Any trees removed from the ROW will be replaced in accordance with City tree code.

Contamination exceeding the CUL will be removed. As described in Section 4.1, a minimum of 1 foot of soil will be excavated and will be replaced with clean soil or, in ROWs, with crushed surfacing. Excavations adjacent to existing hardscaping (e.g., roads, driveways) and structures will be constructed with sideslopes to avoid undermining. Excavations on steeper slopes may be benched to allow compaction of clean fill during restoration. Very steep slopes and areas that are inaccessible to equipment (e.g., small areas confined by structures or hardscapes) will be further evaluated during predesign activities. The exact maximum slope allowed for various scenarious will be determined in consultation with the structural engineer. Means such as hand excavation may be used to remove soils to the maximum extent practicable.

It is the Port's responsibility to ensure that BMPs are being followed. BMPs for soils and stormwater will be used to during excavation and removal eliminate or minimize any releases of contaminants. BMPs may include:

- Dampening soil to limit dust
- Avoiding overwatering to prevent erosion or migration of contaminated soil
- Covering disturbed soil, open excavations, and soil piles with plastic sheeting to reduce stormwater contact with potentially contaminated soil and soil runoff
- Loading trucks in a careful, controlled manner to minimize spillage, and placing plastic sheeting beneath the swing path of the excavator to contain any soil that is spilled

- Using rubber rumble strips immediately adjacent to loading areas to dislodge loose soil from truck tires before trucks leave the site
- Covering soil loads before trucks leave the work site
- Monitoring roadways to ensure that soil is not being tracked off site
- Street sweeping (if required) to removed tracked soil from roadways

Following excavation, each yard will be surveyed by the contractor; this topographic survey will be submitted to the engineer for approval. Alternative means, such as grade stakes, may also be used to verify excavation completion. The engineer will compare the elevations of the excavation to the preconstruction elevations to ensure that the full excavation extent has been achieved prior to placement of clean soil and restoration.

A structural engineer will be retained by the Port to evaluate existing foundation conditions immediately prior to construction. This evaluation will document visible cracks or other indications of pre-existing damage. Following construction, the structural engineer will re-evaluate each foundation to ensure that there has been no foundation damage as a result of the construction activities. The Port will keep these pre- and post-construction foundation inspection records on file; these records will be made available to the property owner upon request.

4.2.2 Restoration Approach

Property owners will be provided with two options for yard restoration:

1. Restore with lawn and mulched bed(s).
2. Restore with the same or in-kind landscaping that was removed.

All property owners will have the opportunity to meet with a landscape architect (LA), licensed in the State of Washington, to develop the property landscape restoration design during the precleanup planning visit(s). During this consultation, the LA will present the restoration options to the property owner and the preferred option and configuration will be selected.

Option 1 will include restoration with lawn, mulched bed(s), or a combination of the two. The restoration planting installation available to each property owner will be based on the total area of landscape impacted, multiplied by an installation unit price. The LA will provide the property owner with a preselected palette of native and adaptive vegetation and planting design themes. Together they will determine the desired extents of lawn and/or mulched bed(s) in the cleanup areas. Provisions to remove and replant, or replace, plants of special concern to the property owner will be made. The LA will then prepare a design that will not exceed the predetermined installation cost.

Some of the property owners may prefer to restore the impacted areas with the same or in-kind landscape that was in place prior to cleanup (Option 2). A limited number of properties identified for cleanup have well-established landscapes; costs to restore these properties to preconstruction conditions may exceed the valuation established by multiplication of the disturbed area by the installation unit price. The LA will perform a comprehensive evaluation and documentation of the preconstruction landscaping; this effort will include identification of vegetation locations and species as well as the dimensions and orientation of all landscape design elements to be replaced. The LA will then prepare a restoration design as part of the cleanup plan. The estimated cost of restoration for these properties will be determined after the restoration design is prepared. The Port and Ecology will review and approve the cost before the final cleanup plan is provided to the property owner for approval.

Protecting existing trees during the cleanup may not be feasible if the arborist determines that the tree is unhealthy/inviable (see Section 4.2.1); therefore, property owners may be given the option of having a tree(s) replaced with a nursery-stock tree following completion of the cleanup.

At properties where existing fencing was removed to facilitate cleanup, the property owner will be given the option of two types of replacement fencing that are in compliance with City code: a cedar privacy fence or a chain-link fence. Both fencing options may be installed to a height of either 3.5 or 6 feet, to be selected consistent with City code. It is assumed that fences along adjoining properties will be constructed of cedar unless both parties are in agreement on the installation of chain-link. Many existing fences appear to fall within the City ROW. Replacement fences will be installed at the property line or, if requested by the property owner, within the property line. Fences will not be reinstalled in the City ROW.

Any ROW features (signage, etc.) removed or disturbed during construction will be restored.

Ecology and the Port will provide information to property owners regarding appropriate lawn and vegetation care to support successful establishment of landscaping.

4.3 Health and Safety Procedures

A site-specific health and safety plan, consistent with WAC 173-340-810, has been provided in the RI work plan (MFA, 2015). The interim action will be conducted according to WAC 173-340-810; the Occupational Safety and Health Act (OSHA) of 1970 (29 U.S. Code Sec. 651 et seq.); the Washington Industrial Safety and Health Act (Chapter 49.17 RCW); and relevant regulations.

The Port will retain a contractor that will complete the work in compliance with OSHA regulations. The contractor will be required to use a crew that has received Hazardous Waste Operations and Emergency Response Standard 40-hour training.

4.4 Cultural Resources

The proposed interim action would have no effect on historic resources that may be present. Systematic archaeological surveys will be conducted on properties to which access is granted to determine if archaeological resources are present. Where resources are identified, measures will be defined to address project impacts in coordination with the Washington Department of Archaeology and Historic Preservation and appropriate tribes. The interim action will be conducted consistent with a cultural resources monitoring and/or inadvertent discovery plan to address any archaeological discoveries made during the proposed action.

4.5 Schedule

Ecology approval is required before the interim action can begin. Ecology shall provide public notice and opportunity for comment on this IAWP under WAC 173-340-600 and consistent with requirements set forth in WAC 173-340-430(8).

The interim action cleanup is planned to begin in summer 2016. The deadline for reaching consensus with property owners on the draft cleanup plan is March 25, 2016, to allow sufficient time for developing the property-specific cleanup design documents and for contracting work. A cleanup agreement that incorporates a cleanup contract and additional property-specific design elements (e.g., surveyor data) will be prepared for owners. The deadline for owners to sign the cleanup agreement contract is May 1, 2016.

At some properties, sampling has not yet been conducted (i.e., property 023) or new owners have recently take possession (i.e., properties 029A/B and 032). The homeowners for these properties may not meet the May 1, 2016, deadline set for construction in summer 2016. In addition, significant rains or other unanticipated conditions could delay construction. Cleanup may be conducted in spring 2017 or later if construction is not completed for all cleanup properties during summer 2016.

An engineering design report incorporating the property-specific cleanup plans will be submitted for Ecology review at least one week before these plans are submitted to homeowners. Following Ecology approval of the engineering design report, contracting will be initiated and contract(s) will be awarded. Work mobilization will begin in June 2016. Owners will be notified of the work start date at least one week in advance. Prior to the interim action, imported soil fill testing results will be provided to Ecology. Upon completion of the interim action, technical memoranda incorporating the following items will be submitted to Ecology:

- Descriptions of field activities and observations
- Survey showing the final lateral and vertical extents of the excavations, finished grade, and landscape components
- Copies of the waste disposal manifest
- Copies of laboratory analytical results

LIMITATIONS

The services undertaken in completing this plan were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This plan is solely for the use and information of our client unless otherwise noted. Any reliance on this plan by a third party is at such party's sole risk.

Opinions and recommendations contained in this plan apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this plan.

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TABLES

Table 2-1
ROW Soil Sample Results (2010-2012)
Former PWT Site
Ridgefield, Washington

Location ID	MTCA Method B Soil CULs	SS-34	SS-35	SS-36	SS-43	SS-44	SS-45	SS-46	SS-47	SS-48	SS-49	SS-54
Sample ID		SS-34	SS-35	SS-36	SS-43	SS-44	SS-45	SS-46	SS-47	SS-48	SS-49	SS-54
Sample Date		06/17/2010	06/17/2010	06/17/2010	09/21/2010	09/21/2010	09/21/2010	05/24/2011	05/24/2011	05/24/2011	05/24/2011	05/24/2011
Sample Depth (feet bgs)		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Area		Residential	Residential	Residential	OPP	OPP	OPP	Residential	OPP	OPP	OPP	OPP
Phenols (ug/kg)												
Pentachlorophenol	8,300	19.9 U	18.3 U	18.7 U	23.2	17.8 U	18 U	--	--	--	--	--
Metals (mg/kg)												
Arsenic	20[a]	9.52	8.90	6.89	7.99	6.58	7.17	--	--	--	--	--
Chromium	120,000	15.6	18.2	12.5	15.9	17.3	18.1	--	--	--	--	--
Copper	3,000	9.56	15.3	11.7	12	16.5	8.1	--	--	--	--	--
Zinc	24,000	99.7	97.4	82.5	119	160	76.2	--	--	--	--	--
PAHs (ug/kg)												
Total PAH	--	ND	110	ND	251	143	ND	--	--	--	--	--
Naphthalene	1,600,000	8.83 U	8.12 U	8.32 U	7.49 U	7.89 U	8 U	--	--	--	--	--
Acenaphthylene	--	8.83 U	8.12 U	8.32 U	7.49 U	7.89 U	8 U	--	--	--	--	--
Acenaphthene	4,800,000	8.83 U	8.12 U	8.32 U	7.49 U	7.89 U	8 U	--	--	--	--	--
Fluorene	3,200,000	8.83 U	8.12 U	8.32 U	7.49 U	7.89 U	8 U	--	--	--	--	--
Phenanthrene	--	8.83 U	8.12	8.32 U	14.2	11.8	8 U	--	--	--	--	--
Anthracene	24,000,000	8.83 U	8.12 U	8.32 U	7.49 U	7.89 U	8 U	--	--	--	--	--
2-Methylnaphthalene	320,000	--	--	--	7.49 U	7.89 U	8 U	--	--	--	--	--
Fluoranthene	3,200,000	8.83 U	9.74	8.32 U	37.4	18.9	8 U	--	--	--	--	--
Pyrene	2,400,000	8.83 U	9.74	8.32 U	24.7	14.2	8 U	--	--	--	--	--
Benzo(a)anthracene	--	8.83 U	8.12 U	8.32 U	12.7	7.89 U	8 U	--	--	--	--	--
Chrysene	--	8.83 U	8.12 U	8.32 U	27.7	13.4	8 U	--	--	--	--	--
Benzo(a)pyrene	140	8.83 U	11.4	8.32 U	15.7	8.68	8 U	--	--	--	--	--
Indeno(1,2,3-c,d)-pyrene	--	8.83 U	9.74	8.32 U	18.7	11	8 U	--	--	--	--	--
Dibenzo(a,h)anthracene	--	8.83 U	8.12 U	8.32 U	11.2	7.89 U	8 U	--	--	--	--	--
Benzo(ghi)perylene	--	8.83 U	12.2	8.32 U	21	11.8	8 U	--	--	--	--	--
Benzo(b)fluoranthene	--	8.83 U	12.2	8.32 U	30.7	13.4	8 U	--	--	--	--	--
Benzo(k)fluoranthene	--	8.83 U	8.12 U	8.32 U	10.5	7.89 U	8 U	--	--	--	--	--
1-Methylnaphthalene	24,000	--	--	--	7.49 U	7.89 U	8 U	--	--	--	--	--
cPAH TEQ	140	ND	14.9	ND	24.4	12.4	ND	--	--	--	--	--
Dioxins and Furans (ng/kg)												
1,2,3,4,6,7,8-HpCDD	--	9.7	59	68	1100	550	160	21	1400	670	590	21
1,2,3,4,6,7,8-HpCDF	--	1.5 J	7.8	8.2	170	110	25	5.3	190	160	93	12
1,2,3,4,7,8,9-HpCDF	--	0.33 U	0.63 J	0.61 J	11	6.1	2.1 J	0.22 U	13	10	5.5	0.12 U
1,2,3,4,7,8-HxCDD	--	0.17 J	0.61 J	0.33 U	14	7.5	2.5 J	0.091 U	14	8.8	9.5	0.38
1,2,3,4,7,8-HxCDF	--	0.35 J	1.4 J	2.1 J	25	12	2.3 J	0.072 U	50	16	13	0.09 U
1,2,3,6,7,8-HxCDD	--	0.54 J	3.1 J	3.3 J	72	32	9	0.11 U	71	30	33	0.11 U
1,2,3,6,7,8-HxCDF	--	0.15 U	0.74 J	0.99 J	16	4.9	1.3 J	1.1 U	31 U	28 U	16 U	0.14 U
1,2,3,7,8,9-HxCDD	--	0.25 J	1.3 J	1.4 J	34	16	4.9	0.077 U	32	15	19	0.14 U
1,2,3,7,8,9-HxCDF	--	0.18 U	0.39 J	0.66 J	6.6	3.4 J	0.7 J	0.081 U	13	0.17 U	0.15 U	0.13 U
1,2,3,7,8-PeCDD	--	0.15 J	0.37 J	0.35 J	8.2	3.9 J	1.3 J	0.077 U	5.6	0.27 U	0.17 U	0.18 U
1,2,3,7,8-PeCDF	--	0.088 U	0.18 U	0.41 J	4.6	3.1 J	0.53 J	0.14 U	7.6	3.3 U	0.2 U	0.14 U
2,3,4,6,7,8-HxCDF	--	0.21 J	0.81 J	1.2 J	17	8.6	2 J	0.068 U	27	11	11	0.11 U

Location ID	MTCA Method B Soil CULs	SS-34	SS-35	SS-36	SS-43	SS-44	SS-45	SS-46	SS-47	SS-48	SS-49	SS-54
Sample ID		SS-34	SS-35	SS-36	SS-43	SS-44	SS-45	SS-46	SS-47	SS-48	SS-49	SS-54
Sample Date		06/17/2010	06/17/2010	06/17/2010	09/21/2010	09/21/2010	09/21/2010	05/24/2011	05/24/2011	05/24/2011	05/24/2011	05/24/2011
Sample Depth (feet bgs)		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Area		Residential	Residential	Residential	OPP	OPP	OPP	Residential	OPP	OPP	OPP	OPP
2,3,4,7,8-PeCDF	--	0.13 J	0.8 J	1.4 J	11	6	1.2 J	0.19 U	23	7.3	9.5	0.13 U
2,3,7,8-TCDD	--	0.13 U	0.12 U	0.2 U	3.1	0.76 J	0.28 J	0.11 U	2.3	4.5	0.12 U	0.16 U
2,3,7,8-TCDF	--	0.24 J	0.25 J	0.3 J	1.9 U	1.7 U	1 U	0.51	3.1	3	1.3	0.16 U
OCDD	--	69	370	500	6500 J	3500	1400	150	11000 J	5200	3500	130
OCDF	--	4.3 J	17	10	210	150	79	18	230	510	160	0.13 U
Total HpCDDs	--	19	100	140	2000	960	270	38	2200	1100	980	34
Total HpCDFs	--	4.3 J	8.4	24	460	270	76	18	410	520	250	34
Total HxCDDs	--	3.4 J	14	15	330	170	51	5.8	310	170	190	6.2
Total HxCDFs	--	1.8 J	12	17	350	190	40	6.8	540	230	200	22
Total PeCDDs	--	0.24 J	1.4 J	0.88 J	31	24	7.8	0.77 J	30	30	25	0.11 U
Total PeCDFs	--	1.3 J	6.8	9.7	79	56	14	1.1 J	180	76	95	5 J
Total TCDDs	--	0.37 J	0.12 U	0.23 J	8.7	7.4	4.3	0.86 J	9.1	19	4.6	0.16 U
Total TCDFs	--	1.2	1.6	1.3	15	16	5.8	0.088 U	29	47	22	0.45 J
Total TEQ Mammals (U=1/2 EDL)	**13**	0.49	2.3	2.8	**48**	**23**	6.6	0.57	**57**	**27**	**20**	0.64

Location ID	MTCA Method B Soil CULs	SS-55	SS-56	SS-57	SS-58	SS-59	SS-43-Comp-0-6	SS-44-Comp-0-6	SS-47-Comp-0-6	SS-48-Comp-0-6	SS-49-Comp-0-6	SS-57-Comp-0-6
Sample ID		SS-55	SS-56	SS-57	SS-58	SS-59	SS-43-Comp	SS-44-Comp	SS-47-Comp	SS-48-Comp	SS-49-Comp	SS-57-Comp
Sample Date		05/24/2011	05/24/2011	05/24/2011	05/24/2011	05/24/2011	09/20/2012	09/20/2012	09/20/2012	09/20/2012	09/20/2012	09/20/2012
Sample Depth (feet bgs)		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-6	0-6	0-6	0-6	0-6	0-6
Area		Residential	OPP	OPP	Residential	Residential	OPP	OPP	OPP	OPP	OPP	OPP
Phenols (ug/kg)												
Pentachlorophenol	8,300	--	--	--	--	--	--	--	--	--	--	--
Metals (mg/kg)												
Arsenic	20[a]	--	--	--	--	--	--	--	--	--	--	--
Chromium	120,000	--	--	--	--	--	--	--	--	--	--	--
Copper	3,000	--	--	--	--	--	--	--	--	--	--	--
Zinc	24,000	--	--	--	--	--	--	--	--	--	--	--
PAHs (ug/kg)												
Total PAH	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	1,600,000	--	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	4,800,000	--	--	--	--	--	--	--	--	--	--	--
Fluorene	3,200,000	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	--
Anthracene	24,000,000	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	320,000	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	3,200,000	--	--	--	--	--	--	--	--	--	--	--
Pyrene	2,400,000	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	140	--	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-c,d)-pyrene	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzo(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(ghi)perylene	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--
1-Methylnaphthalene	24,000	--	--	--	--	--	--	--	--	--	--	--
cPAH TEQ	140	--	--	--	--	--	--	--	--	--	--	--
Dioxins and Furans (ng/kg)												
1,2,3,4,6,7,8-HpCDD	--	140	82	670	63	54	83	9.3	590	9.9	31	4.2 U
1,2,3,4,6,7,8-HpCDF	--	26	12	100	11	9.6	12	1.6 J	55 U	2.3 J	3.4 J	0.65 U
1,2,3,4,7,8,9-HpCDF	--	0.24 U	0.69	6.5	0.3 U	0.52	0.65 J	0.13 U	6.1	0.22 U	0.23 J	0.28 U
1,2,3,4,7,8-HxCDD	--	0.18 U	0.22 U	9.7	0.15 U	0.15 U	0.99 J	0.14 U	5.4	0.25 U	0.64 J	0.16 U
1,2,3,4,7,8-HxCDF	--	0.24 U	0.12 U	21 U	2.9 U	0.24 U	1.4 J	0.15 U	29	0.24 U	0.56 J	0.25 U
1,2,3,6,7,8-HxCDD	--	7.5	0.14 U	40	0.15 U	0.15 U	4 J	0.58 J	36	0.64 J	1.8 J	0.5 J
1,2,3,6,7,8-HxCDF	--	0.09 U	0.097 U	11	0.17 U	0.24 U	0.51 J	0.2 U	16 U	0.2 U	0.3 J	1.7 U
1,2,3,7,8,9-HxCDD	--	0.13 U	0.13 U	18	0.15 U	0.13 U	2 J	0.3 J	11	0.31 J	1 J	0.42 J
1,2,3,7,8,9-HxCDF	--	0.17 U	0.15 U	0.18 U	0.15 U	0.12 U	0.11 U	0.085 U	6.1	0.26 U	0.12 U	0.23 U
1,2,3,7,8-PeCDD	--	0.12 U	0.42	0.16 U	0.48	0.2 U	0.41 U	0.16 U	1.8 J	0.18 U	0.21 J	0.17 U
1,2,3,7,8-PeCDF	--	0.12 U	0.14 U	0.11 U	0.28 U	0.22 U	0.31 U	0.15 U	4.4 J	0.19 U	0.18 U	0.26 U
2,3,4,6,7,8-HxCDF	--	0.12 U	0.1 U	13	0.074 U	0.11 U	0.94 J	0.14 U	13	0.27 J	0.59 J	0.78 J

Table 2-1
ROW Soil Sample Results (2010-2012)
Former PWT Site
Ridgefield, Washington

Location ID	MTCA Method B Soil CULs	SS-55	SS-56	SS-57	SS-58	SS-59	SS-43-Comp-0-6	SS-44-Comp-0-6	SS-47-Comp-0-6	SS-48-Comp-0-6	SS-49-Comp-0-6	SS-57-Comp-0-6
Sample ID		SS-55	SS-56	SS-57	SS-58	SS-59	SS-43-Comp	SS-44-Comp	SS-47-Comp	SS-48-Comp	SS-49-Comp	SS-57-Comp
Sample Date		05/24/2011	05/24/2011	05/24/2011	05/24/2011	05/24/2011	09/20/2012	09/20/2012	09/20/2012	09/20/2012	09/20/2012	09/20/2012
Sample Depth (feet bgs)		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-6	0-6	0-6	0-6	0-6	0-6
Area		Residential	OPP	OPP	Residential	Residential	OPP	OPP	OPP	OPP	OPP	OPP
2,3,4,7,8-PeCDF	--	8	0.11 U	13	0.12 U	0.16 U	0.58 J	0.13 U	5.9	0.21 J	0.59 J	0.38 J
2,3,7,8-TCDD	--	0.12 U	0.26 U	0.19 U	0.12 U	0.12 U	0.13 J	0.1 U	0.19 U	0.37 J	0.12 U	0.18 U
2,3,7,8-TCDF	--	0.28 U	0.23 U	1.4	0.12 U	0.24 U	0.19 J	0.13 U	1.1 U	0.16 U	0.2 U	0.25 U
OCDD	--	770	460	3500	360	330	440	74	4600	78	170	31
OCDF	--	36	0.15 U	110	13	16	12	2.6 J	87	5.9 J	5.2 J	1.1 U
Total HpCDDs	--	230	140	1200	110	97	130	18	1100	18	51	4.6 J
Total HpCDFs	--	73	28	260	31	25	26	4.1 J	160	6.4	8.7	1.5 J
Total HxCDDs	--	35	18	190	20	16	20	2.8 J	140	3.6 J	9.1	3.3 J
Total HxCDFs	--	99	28	270	24	24	19	2.3 J	310	3 J	8.7	8.7
Total PeCDDs	--	5.7 J	1.4 J	23	1.3 J	1.5 J	0.7 J	0.16 U	5.8	0.18 U	0.73 J	0.17 U
Total PeCDFs	--	120	11	150	14	13	6.7	1.1 J	120	1.4 J	6	12
Total TCDDs	--	0.36 J	0.098 U	4.7	0.12 U	0.56 J	0.54 J	0.1 U	0.19 U	0.67 J	0.44 J	0.18 U
Total TCDFs	--	20	0.48 J	26	3.6	1.7	0.89 J	0.13 UJ	7.7	0.22 U	1.5	2.5
Total TEQ Mammals (U=1/2 EDL)	**13**	5.2	1.7	**23**	1.6	1.0	2.6	0.41	**22**	0.85	1.4	0.63

NOTES:

Bold indicates values that exceed the MTCA Method B Soil CUL; if values were non-detects ("U"), one-half the reported concentration was compared with the MTCA Method B Soil CUL. Estimated values were compared with the MTCA Method B Soil CUL.

Total PAH includes the following PAHs: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, 2-methylnaphthalene, 1-methylnaphthalene (if available), fluoranthene, pyrene, benzo(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.

-- = no value.

bgs = below ground surface.

cPAH = carcinogenic PAH.

CUL = cleanup level.

EDL = estimated detection limit.

J = Estimated value. Value used in calculations.

mg/kg = milligrams per kilogram.

MTCA = Model Toxics Control Act.

ND = not detected.

ng/kg = nanograms per kilogram.

OPP = off-property portion.

PAH = polycyclic aromatic hydrocarbon.

PWT = Pacific Wood Treating Co.

ROW = right-of-way.

TEQ = toxicity equivalent.

U = Not detected. One half the reported concentration used in dioxin TEQ and Total PAH calculations.

ug/kg = micrograms per kilogram.

[a]MTCA Method A level adjusted for background.

Location	MTCA Method B Soil CUL	AOI001	AOI002	AOI003	AOI004	AOI005	AOI005	AOI005	AOI006	AOI006	AOI007	AOI008
Sample ID		COMP-A0I001-0.5-11/20/15	ISM-A0I002-0.5	ISM-AOI003-0.5	Comp-AOI004-0.5	ISM-AOI005-0.5	SBS-AOI005-1.0	SBS-AOI005-1.0-Dup	ISM-AOI006-0.5	SBS-AOI006-1.0	ISM-AOI007-0.5	ISM-AOI008-0.5
Sample Date		11/20/2015	11/20/2015	02/09/2016	07/28/2015	04/16/2015	04/16/2015	04/16/2015	04/16/2015	04/16/2015	04/16/2015	05/21/2015
Sample Type		Composite	ISM	ISM	Composite	ISM	Discrete	Discrete Dup	ISM	Discrete	ISM	ISM
Sample Depth (feet bgs)		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0.5-1.0	0.5-1.0	0-0.5	0.5-1.0	0-0.5	0-0.5
Dioxins and Furans (ng/kg)												
1,2,3,4,6,7,8-HpCDD	--	992	322	334	320	1810	1900	2180	930	572	1650	288
1,2,3,4,6,7,8-HpCDF	--	241	157	48.4	42.1	249	288	316	123	74.6	246	46.8
1,2,3,4,7,8,9-HpCDF	--	16.3	3.98	2.73	2.63 J	15.3	17.6	19.5	6.94	4.32	15.2	2.76
1,2,3,4,7,8-HxCDD	--	25.5	4.89	4.83	4.65 J	18.1	17.1	20.3	10	5.03	11.7	3.19
1,2,3,4,7,8-HxCDF	--	29.4	9.82	6.75	5.98	44.4	48.3	56	18.1	12.8	58.8	4.07
1,2,3,6,7,8-HxCDD	--	110	20.2	16.1	20.3	94.6	93.5	104	46.9	26.6	81.8	12.7
1,2,3,6,7,8-HxCDF	--	15.1 U	4.64	3.36	2.81 J	22	21.4	25.5	8.23	5.29	22.3	2.15
1,2,3,7,8,9-HxCDD	--	63.7	12.6	13	12.4	55.5	51	60.4	29.1	14.1	35.9	8.79
1,2,3,7,8,9-HxCDF	--	0.615	0.236 J	0.135 J	0.176 J	0.854 J	0.9 J	1.14	0.487 J	0.329 J	1.12	0.276 J
1,2,3,7,8-PeCDD	--	11.8	2.24	2	2.49 J	8.29	6.98	7.94	4	1.98	4.25	1.92
1,2,3,7,8-PeCDF	--	4.53	1.29	0.847	1.28 J	5.7	5.77	6.96	2.36	1.51	6.39	0.829 J
2,3,4,6,7,8-HxCDF	--	9.61	4.68	2.65	2.35 J	14	13.6	15.3	5.11	3.36	12	1.46
2,3,4,7,8-PeCDF	--	5.48	3.37	1.64	1.46 J	9.1	8.31	10.8	3.14	2.21	10.2	0.999 J
2,3,7,8-TCDD	--	1.09	0.549	3.71	0.856 J	8.64	0.845	1.12	10.8	6.74	0.317	1.87
2,3,7,8-TCDF	--	1.43	0.703	1.33	0.74 J	2.28	1.89	2.65	0.9 U	0.68 J	1.98	0.95 J
OCDD	--	2130 J	2210	1760	1860	9800	10800	11800	4960	2890	11800	1720
OCDF	--	349	108	66.3	68.6	265	354	372	148	79.1	207	90.2
Total HpCDDs	--	1830	541	569	537	3020	3150	3770	1520	936	2770	468
Total HpCDFs	--	644	295	121	109	649	792	869	326	198	657	132
Total HxCDDs	--	451	100	90	98.4	429	408	470	214	122	311	67.7
Total HxCDFs	--	402	141	88.6	76.8	537	579	651	218	144	601	50.7
Total PeCDDs	--	44.6	10.1	10.3	13.1	42.5	30.8	36.2	16.8	10.2	16.8	9.15
Total PeCDFs	--	122	65.5	23.5	13	150	127	147	35.6	23	142	9.77
Total TCDDs	--	11.6	6.82	5.63	3.27	23.5	7.57	9.59	13.5	8.29	2.33	4.37
Total TCDFs	--	28.8	23.2	6.44	10.3	56.2	32.4	44	9.18	5.4	15.5	6.97
Total TEQ Mammals (U=1/2 EDL)	**13**	**52.7**	**15.1**	**15.4**	13.0	**68.8**	**60.7**	**69.8**	**39.8**	**23.6**	**53.1**	11.4
Conventionals												
Total Organic Carbon (mg/kg)	--	18000	18000	17000	21000	17000	12000	13000	17000	10000	21000	19000

Location	MTCA Method B Soil CUL	AOI009	AOI010	AOI011	AOI012	AOI013	AOI013	AOI014	AOI015	AOI016	AOI017	AOI017
Sample ID		ISM-A0I009-0.5	ISM-AOI010-0.5	ISM-AOI011-0.5	ISM-AOI012-0.5	ISM-AOI013-0.5-B	ISM-AOI013-0.5-F	ISM-AOI014-0.5	ISM-AOI015-0.5	ISM-AOI016-0.5	ISM-AOI017-0.5-A	ISM-AOI017-0.5-B
Sample Date		11/20/2015	12/02/2015	04/16/2015	04/23/2015	04/16/2015	04/16/2015	04/23/2015	04/23/2015	05/07/2015	04/23/2015	04/23/2015
Sample Type		ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM
Sample Depth (feet bgs)		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Dioxins and Furans (ng/kg)												
1,2,3,4,6,7,8-HpCDD	--	124	142	341	542	1450	3560	1230	4080	972	1180	836
1,2,3,4,6,7,8-HpCDF	--	28.8	18.1	71.4	101	199	500	205 U	584	142	214	139
1,2,3,4,7,8,9-HpCDF	--	2.33	1.03	4.05	5.4	11.4	29.8	10.7	26.3	8.19	13.6	7.28
1,2,3,4,7,8-HxCDD	--	1.55	0.974	3.17	6.27	13.8	28.2	14.8	80	13.1	18.6	11.3
1,2,3,4,7,8-HxCDF	--	6.79	1.9	4.95	12.6	31.7	91.6	32.2	74	24	22.9	16.6
1,2,3,6,7,8-HxCDD	--	5.35	4.38	15.7	24.6	72	159	58	285	46.7	63.8	41.3
1,2,3,6,7,8-HxCDF	--	1.54	0.694	3.21	7.46	14.9	37.5	15.7	83.7	11.8	14.4	9.41
1,2,3,7,8,9-HxCDD	--	3.75	2.69	9.88	15.1	38.9	66.4	31.6	191	30.5	40	23.3
1,2,3,7,8,9-HxCDF	--	0.118 J	0.0691 J	0.19 U	0.27 J	0.833 J	1.8	0.608 J	1	0.462 J	0.47 J	0.273 U
1,2,3,7,8-PeCDD	--	0.627 J	0.396 J	1.45	2.45	6.25	8.81	5.4	45.5	5.87	7.15	4.39
1,2,3,7,8-PeCDF	--	0.414 J	0.236 J	0.83 J	1.88	5	11	4.33	14.6	3.56	3.52	2.4
2,3,4,6,7,8-HxCDF	--	1.05	0.67	2.24	4.93	9.39	23.4	9.89	45.9	7.48	8.15	6.01
2,3,4,7,8-PeCDF	--	0.814	0.371 J	1.04	2.57	6.27	15.7	5.93	14.1	5.06	4.32	3.14
2,3,7,8-TCDD	--	1.12	0.359	0.142 J	0.471 U	0.964	3.79	0.589	3.37	0.485 J	3.37	2.77
2,3,7,8-TCDF	--	0.404 J	0.636 J	0.5 J	2.03	2.67	3.08	0.76 U	4.92	1.61	1.48	0.95 J
OCDD	--	841	1410	1810	3500	8790	20400	7750	19400	5390	7020	5060
OCDF	--	62.2	42.1	141	122	288	557	219	375	166	290	172
Total HpCDDs	--	216	284	549	906	2480	6120	2180	7470	1700	1920	1410
Total HpCDFs	--	81.1	53	207	231	541	1350	284	1080	362	532	329
Total HxCDDs	--	31.1	29.2	76.8	135	349	641	276	2090	262	329	209
Total HxCDFs	--	46	23.5	90.1	160	374	1070	360	1060	311	306	214
Total PeCDDs	--	4.06	2.03	7.37	14.5	38.9	38.4	29.8	301	35.6	34.2	23.3
Total PeCDFs	--	12.9	7.72	14.7	57.6	70.7	208	102	365	118	77	57.2
Total TCDDs	--	2.82	1.48	1.37	3.61	16.5	8.76	6.26	28	7.4	9.97	6.09
Total TCDFs	--	5.27	3.14	5.74	16.1	32.5	24.6	17.9	43.4	23.8	18	12.4
Total TEQ Mammals (U=1/2 EDL)	**13**	5.88	4.12	10.7	**18.4**	**47.0**	**106**	**40.0**	**183**	**34.4**	**45.2**	**30.5**
Conventionals												
Total Organic Carbon (mg/kg)	--	14000	16000	13000	17000	17000	16000	16000	18000	21000	17000	16000

Table 2-2
Yard Soil Sample Results
Former PWT Site
Ridgefield, Washington

Location	MTCA Method B Soil CUL	AOI017	AOI017	AOI018	AOI018	AOI018	AOI018	AOI018	AOI019	AOI020B	AOI020B	AOI021
Sample ID		ISM-AOI017-0.5-C	SBS-AOI017-1.0	ISM-AOI018-0.5-B-A	ISM-AOI018-0.5-B-B	ISM-AOI018-0.5-B-C	ISM-AOI018-0.5-F	SBS-AOI018-1.0	ISM-AOI019-0.5	ISM-AOI020B-0.5	SBS-AOI020B-1.0	ISM-AOI021-0.5
Sample Date		04/23/2015	04/23/2015	04/16/2015	04/16/2015	04/16/2015	04/16/2015	04/16/2015	06/22/2015	04/30/2015	04/30/2015	04/30/2015
Sample Type		ISM	Discrete	ISM	ISM	ISM	ISM	Discrete	ISM	ISM	Discrete	ISM
Sample Depth (feet bgs)		0-0.5	0.5-1.0	0-0.5	0-0.5	0-0.5	0-0.5	0.5-1.0	0-0.5	0-0.5	0.5-1.0	0-0.5
Dioxins and Furans (ng/kg)												
1,2,3,4,6,7,8-HpCDD	--	1100	175	379	444	390	553	54.9	529	734	119	115
1,2,3,4,6,7,8-HpCDF	--	187	25.8	96.1	73.2	66.4	78.6	9.37	81.3	134	23.3	17.6
1,2,3,4,7,8,9-HpCDF	--	10.1	3.43	3.62	3.39	2.96	4.04	0.466 J	4.46	5.95	0.907	0.856 J
1,2,3,4,7,8-HxCDD	--	15.2	3.69	4.4	4.62	4.32	6.43	0.609 J	5.92	8.4	1.12	1.06
1,2,3,4,7,8-HxCDF	--	22.5	5.52	8.65	7.66 U	6.73 U	9.91	1.16 U	17.2	16.7	2.41	1.49
1,2,3,6,7,8-HxCDD	--	54.9	10.4	20.2	21.4	20.1	27.8	2.74	30.1	33.2	4.93	4
1,2,3,6,7,8-HxCDF	--	12.5	3.66	4.57	3.98	3.47	5.2	0.607 J	6.87	8.46	1.23	0.774 J
1,2,3,7,8,9-HxCDD	--	36.5	6.93	14.1	14.8 U	13 U	17.1	2.03 U	16.9	24.8	4.65	3.74
1,2,3,7,8,9-HxCDF	--	0.327 J	1.78	0.25 J	0.229 U	0.207 J	0.323 J	0.107 U	0.304 U	0.268 J	0.056 J	0.103 U
1,2,3,7,8-PeCDD	--	6.84	2.47	2.14	2.32	2.05	2.8	0.319 J	3.27	3.26	0.496	0.478 J
1,2,3,7,8-PeCDF	--	3.34	2.26	1.28	1.4	1.04	1.45	0.293 J	2.18	2.1	0.377	0.233 J
2,3,4,6,7,8-HxCDF	--	7.47	3.14	3.17	2.78	2.41	3.48	0.44 J	4.57	5.52	0.92	0.556 J
2,3,4,7,8-PeCDF	--	4.54	2.33	1.72	1.73	1.31	2.02	0.3 J	3.23	2.98	0.554	0.313 J
2,3,7,8-TCDD	--	4.13	1.22	0.324	0.326	0.255	0.461	0.109 U	2.69	1.54	0.272	0.116 U
2,3,7,8-TCDF	--	2.4 U	0.51 U	0.84 U	1 U	0.66 J	0.84 J	0.668 U	1.25	1.34	0.32 J	0.13 U
OCDD	--	6960	863	1990	2480	2070	2940	290	2540	3800	745	946
OCDF	--	230	31	87.6	107	84.6	97.1	9.09	67.4	187	33.8	34.8
Total HpCDDs	--	1850	292	636	753	648	933	92.6	866	1240	173	195
Total HpCDFs	--	452	68.6	213	186	160	196	21.7	206	306	47.8	48
Total HxCDDs	--	283	45.9	112	119	109	143	14	141	181	21.6	21.8
Total HxCDFs	--	291	53.9	110	96.4	89.5	140	13.3	188	175	15.6	14.3
Total PeCDDs	--	38	3.72	14.6	13.8	12.5	15.2	1.06	16.1	16	1.47	1.6
Total PeCDFs	--	80	13.3	24.5	19.4	16.6	42.7	2.8	62.1	27	3.22	1.69
Total TCDDs	--	10.3	3.34	4.54	3.97	2.76	4.43	0.641	7.32	4.14	0.569	0.159
Total TCDFs	--	17.2	3.53	11.7	12.6	6.94	13.1	3.33	20.4	7.91	1.67	0.24
Total TEQ Mammals (U=1/2 EDL)	**13**	**42.6**	10.3	**14.0**	**14.8**	**13.1**	**18.3**	1.85	**22.2**	**25.6**	4.17	3.44
Conventionals												
Total Organic Carbon (mg/kg)	--	17000	11000	16000	17000	17000	19000	7500	19000	22000	15000	11000

Location	MTCA Method B Soil CUL	AOI022	AOI024	AOI025	AOI026	AOI027	AOI028A	AOI028B	AOI029A	AOI029B	AOI030
Sample ID		ISM-AOI022-0.5	ISM-AOI024-0.5	ISM-AOI025-0.5	ISM-AOI026-0.5	ISM-AOI027-0.5	ISM-AOI028A-0.5	ISM-AOI028B-0.5	ISM-AOI029A-0.5	ISM-AOI029B-0.5	ISM-AOI030-0.5
Sample Date		12/02/2015	04/30/2015	04/30/2015	09/21/2015	04/30/2015	12/02/2015	12/02/2015	04/30/2015	04/23/2015	04/30/2015
Sample Type		ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM
Sample Depth (feet bgs)		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Dioxins and Furans (ng/kg)											
1,2,3,4,6,7,8-HpCDD	--	252	397	454	273	309	227	424	475	763	299
1,2,3,4,6,7,8-HpCDF	--	34.4	81.4	80.6	37.1	49.1	31.8	89.4	73	130	49
1,2,3,4,7,8,9-HpCDF	--	2.12	4.04	3.96	2.09	2.48	1.86	4.22	4.09	6.97	2.21
1,2,3,4,7,8-HxCDD	--	2.33	4.18	5.87	2.66	3.4	2.72	5.24	5.21	10.5	3.66
1,2,3,4,7,8-HxCDF	--	4.94	8.03	8.34	4.46	5.4	3.75	8.1	8.26	13.7	5.19
1,2,3,6,7,8-HxCDD	--	12.4	16.7	23.3	14.2	13.8	10.9	24.6	23	38.5	12.5
1,2,3,6,7,8-HxCDF	--	2.2	7.22	5.35	2.24	2.6	1.82	4.48	4	7.73	2.41
1,2,3,7,8,9-HxCDD	--	6.39	13.7	20.7	7.29	11.8	7.26	13.6	23.1	23.8	9.36
1,2,3,7,8,9-HxCDF	--	0.101 J	0.208 J	0.234 J	0.135 U	0.137 J	0.122 J	0.247 J	0.249 J	0.322 J	0.465 U
1,2,3,7,8-PeCDD	--	1.01	2.09	2.86	1.61	1.58	1.27	2.32	2.79	5.24	1.2
1,2,3,7,8-PeCDF	--	0.726	1.53	1.56	1.05	0.763 J	0.678 J	1.44	1.55	2.48	0.581 U
2,3,4,6,7,8-HxCDF	--	1.55	7.04	3.69	1.95	2.2	1.45	3.76	3.35	5.96	2.29
2,3,4,7,8-PeCDF	--	0.956	3.21	2.05	1.15	1.03	0.899 J	2.13	1.96	3.48	1
2,3,7,8-TCDD	--	0.895	0.501	0.695	0.29 U	0.488	0.382	0.859	0.359	0.713	0.625 U
2,3,7,8-TCDF	--	0.863	1.93	1.44	0.85 J	0.64 J	1.06	1.25	1.14	0.79 U	0.45 J
OCDD	--	1510	2600	2740	1900	2050	1470	2190	3050	5080	1800
OCDF	--	63.7	138	122	71.6	73.9	50.8	168	75.4	208	72.3
Total HpCDDs	--	437	680	764	453	523	404	744	678	1390	541
Total HpCDFs	--	91.8	212	193	98.2	116	82.1	235	152	329	121
Total HxCDDs	--	56.6	90.6	132	71.2	76.8	58.2	119	97.5	214	79.5
Total HxCDFs	--	58.5	161	101	60.2	54.6	46.7	132	49	179	61.2
Total PeCDDs	--	5.09	12.7	16.2	8.84	8.27	7.14	15	7.82	34.4	5.41
Total PeCDFs	--	19.3	91.2	22.4	9.72	8.3	14.6	81	9.05	57.7	8.14
Total TCDDs	--	2.55	2.15	2.98	1.03	1.16	2.77	7.19	1.66	10.5	0.625 U
Total TCDFs	--	6.99	41.4	9.35	4.87	4.1	7.4	30.7	3.82	18.6	1.69
Total TEQ Mammals (U=1/2 EDL)	**13**	8.65	**15.1**	**17.4**	9.22	10.6	7.91	**15.9**	**17.1**	**27.7**	9.49
Conventionals											
Total Organic Carbon (mg/kg)	--	14000	22000	15000	16000	20000	15000	19000	22000	13000	17000

Table 2-2
Yard Soil Sample Results
Former PWT Site
Ridgefield, Washington

Location	MTCA Method B Soil CUL	AOI030	AOI031	AOI032	AOI032	AOI034	AOI035	AOI036	AOI037	AOI038	AOI039
Sample ID		ISM-AOI030-0.5	ISM-AOI031-0.5	ISM-AOI032-0.5	SBS-AOI032-1.0	ISM-AOI034-0.5	ISM-AOI035-0.5	ISM-AOI036-0.5	ISM-A0I037-0.5	ISM-AOI038-0.5	ISM-AOI039-0.5
Sample Date		05/21/2015	04/16/2015	04/23/2015	04/23/2015	12/02/2015	12/23/2015	04/23/2015	11/20/2015	05/29/2015	05/29/2015
Sample Type		ISM Dup	ISM	ISM	Discrete	ISM	ISM	ISM	ISM	ISM	ISM
Sample Depth (feet bgs)		0-0.5	0-0.5	0-0.5	0.5-1.0	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Dioxins and Furans (ng/kg)											
1,2,3,4,6,7,8-HpCDD	--	337	397	390	169	215	430	563	417	747	428
1,2,3,4,6,7,8-HpCDF	--	45.1	65.9	80.2	36.9	40.5	342	122	75.7	129	94.7
1,2,3,4,7,8,9-HpCDF	--	2.45	3.4	3.88	1.61	2.36	19	6.37	4.69	6.61	6.6
1,2,3,4,7,8-HxCDD	--	4.41	4.15	5.72	2	2.67	8.75	8.11	4.54	14.1	4.77
1,2,3,4,7,8-HxCDF	--	5.3	6.15 U	9.61	1.77	7.17	81.1	13.8	11.5	13.1	17.4
1,2,3,6,7,8-HxCDD	--	15.3	18.8	19.6	6.3	10.6	25.9	28.2	20.6	37.5	19
1,2,3,6,7,8-HxCDF	--	2.47	3.24	5.7	1.23	3.01	37	7.03	4.34	7.06	4.85
1,2,3,7,8,9-HxCDD	--	12.3	11.8 U	13.1	5.4	7.63	26.1	19	12.1	37.7	12.1
1,2,3,7,8,9-HxCDF	--	0.165 U	0.168 U	0.24 J	0.158 U	0.13 J	1.75	0.263 J	0.205 J	0.283 U	0.231 U
1,2,3,7,8-PeCDD	--	2.15	1.95	3.4	0.851 J	1.58	5.8	4.45	1.95	6.94	2.71
1,2,3,7,8-PeCDF	--	0.926 J	0.983 J	1.65	0.243 J	1.04	14.7	2.15	1.24	1.86	1.33
2,3,4,6,7,8-HxCDF	--	1.69	2.23	5.05	1.16	2.94	55.7	6.01	3.16	4.97	3.11
2,3,4,7,8-PeCDF	--	1.2	1.39	2.45	0.349 J	1.71	26.4	3.4	1.97	2.67	2.43
2,3,7,8-TCDD	--	0.265 J	0.248	0.599	0.18 U	1.02	1.2	7.33	3.63	1.81	2.45
2,3,7,8-TCDF	--	0.699 J	1.27	1.39	0.371 U	1.25	10.8	2.24	0.99	1.51	1.34
OCDD	--	1720	2170	2470	893	1330	1050	3560	2460	3960	2580
OCDF	--	74.4	176	154	105	62.6	476	250	145	282	140
Total HpCDDs	--	571	661	659	285	393	692	951	717	1280	716
Total HpCDFs	--	120	196	201	110	95.4	639	323	211	359	284
Total HxCDDs	--	92.6	96.1	114	39.1	64	141	189	103	260	103
Total HxCDFs	--	61.3	83.5	125	41.6	60.4	272	165	121	156	143
Total PeCDDs	--	11.7	10.4	28.8	3.36	8.02	41.5	35.5	13.5	34.4	16.1
Total PeCDFs	--	11.9	19.3	69.3	12.2	28.8	160	67.5	45.1	27.1	24.7
Total TCDDs	--	2.37	4.03	12.3	0.769	7.58	4.76	22.1	10.1	8.14	7.12
Total TCDFs	--	5.63	11.9	23.5	4.53	23.3	64.2	31.3	16.2	13.5	14.5
Total TEQ Mammals (U=1/2 EDL)	**13**	11.4	11.9	**16.4**	5.24	9.68	**48.4**	**29.4**	**17.7**	**31.3**	**18.3**
Conventionals											
Total Organic Carbon (mg/kg)	--	19000	16000	15000	12000	19000	17000	13000	23000	20000	26000

NOTES:
Bold indicates values that exceed MTCA Method B Soil CUL.
-- = no value.
bgs = below ground surface.
CUL = cleanup level.
Dup = duplicate sample.
EDL = estimated detection limit.
ISM = incremental sampling methodology.
J = Estimated value. Value used in calculations.
mg/kg = milligrams per kilogram.
MTCA = Model Toxics Control Act.
ng/kg = nanograms per kilogram.
PWT = Pacific Wood Treating Co.
TEQ = toxicity equivalent.
U = Not detected. One half the reported concentration used in TEQ calculations.

Table 2-3
ROW Soil Sample Results
Former PWT Site
Ridgefield, Washington

Location	MTCA Method B Soil CUL	ROW004	ROW005	ROW005	ROW005	ROW008	ROW010W	ROW010W	ROW010E	ROW012	ROW013	ROW013
Sample ID		SS-ROW004-0.5	SS-ROW005-0.5	SBS-ROW005-1.0	SBS-ROW005-2.0	SS-ROW008-0.5	SS-ROW010W-0.5	SBS-ROW010W-1.5	SS-ROW010E-0.5	SS-ROW012-0.5	SS-ROW013-0.5	SBS-ROW013-1.0
Sample Date		05/07/2015	06/08/2015	06/08/2015	08/26/2015	05/07/2015	11/02/2015	11/02/2015	11/02/2015	04/23/2015	06/08/2015	06/08/2015
Sample Type		Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
Sample Depth (feet bgs)		0-0.5	0-0.5	0.5-1.0	1.5-2.0	0-0.5	0-0.5	1.0-1.5	0-0.5	0-0.5	0-0.5	0.5-1.0
Dioxins and Furans (ng/kg)												
1,2,3,4,6,7,8-HpCDD	--	21.2	1400	1230	279	344	533	27.5	561	345	8550	7280
1,2,3,4,6,7,8-HpCDF	--	6.66	194	175	49.9	57.4	114	5.45	101	44.1	1120	1080
1,2,3,4,7,8,9-HpCDF	--	0.303 J	12.3	11.4	3.21	3.06 J	6.24 J	0.393 J	6.69	2.5	71.6	68.2
1,2,3,4,7,8-HxCDD	--	0.391 J	16.5	13.6	3.89	3.8 J	6.91 J	0.351 J	6.84	3.34	70.7	50.5
1,2,3,4,7,8-HxCDF	--	0.517 J	31.6	24	6.06	4.74 J	19.1	0.784 J	19.9	4.29	280	331
1,2,3,6,7,8-HxCDD	--	1.09 J	65.3	59.1	14.2	14.3	28	1.19	29.8	16.3	378	367
1,2,3,6,7,8-HxCDF	--	0.378 J	14.9	11	3.09	3.12 J	8 J	0.419 J	10.7	2.9	109	107
1,2,3,7,8,9-HxCDD	--	0.876 J	45.4	35.8	9.58	9.15	17.2	0.847 J	16.3	8.66	188	142
1,2,3,7,8,9-HxCDF	--	0.143 U	0.712 J	0.667 J	0.183 J	0.184 UJ	0.314 J	0.106 J	0.512 J	0.157 J	4.57	5.01 J
1,2,3,7,8-PeCDD	--	0.259 J	7.09	5.05	1.56	1.65 J	2.53 J	0.163 J	3.17	1.25	23.4	16.3 J
1,2,3,7,8-PeCDF	--	0.1 U	4.43	2.68 J	1.06	0.763 J	1.81 J	0.185 J	3.08	0.609 J	36.3	37.4
2,3,4,6,7,8-HxCDF	--	0.301 J	8.7	7.9	2.03	2.16 J	6.04 J	0.448 J	8.94	2.13	60.3	66.7
2,3,4,7,8-PeCDF	--	0.148 J	6.08	4.1 J	1.35	1.01 J	3.54 J	0.209 J	5.85	0.862 J	58.6	63
2,3,7,8-TCDD	--	0.111 J	0.664	0.503 U	0.155	0.283 J	0.392 J	0.0968 U	1.66	0.189 U	1.49	2 U
2,3,7,8-TCDF	--	0.38 U	1.84	1.6 U	0.48 J	0.32 U	1.18 J	0.15 J	1.42	0.569 UJ	9.5 U	11.5
OCDD	--	122	8630	6600	1590	1980	3740	157	2580	2160	50400	38300
OCDF	--	8.05 J	257	210	82.1	117	204	11.1	134	72.6	1080	531
Total HpCDDs	--	36.9	2380	2100	517	577	906	46.3	974	601	14900	11800
Total HpCDFs	--	14.3	519	474	138	159	309	14.2	290	116	3070	2870
Total HxCDDs	--	6.79	330	294	79.7	80.2	152	6.26	150	74.9	1640	1330
Total HxCDFs	--	9.45	382	308	95.4	94.4	227	10.7	294	85.6	2940	2180
Total PeCDDs	--	0.636 J	31.6	24.2	8.03	9.11	15.5	0.505 J	20.3	4.94	112	48
Total PeCDFs	--	3.07 J	56.7	55.4	19.1	29.8	114	7.29	248	24.7	462	423
Total TCDDs	--	0.263 J	4.92	0.583 U	0.639	1.52	4.97	0.245	7.33	1.16	13.4	2 U
Total TCDFs	--	0.792 J	13	6.54	6.56	6.64	30	2.3	66.8	6.44	57.4	15.3
Total TEQ Mammals (U=1/2	**13**	1.12	**46.9**	**38.1**	9.93	10.7	**20.4**	1.09	**23.6**	10.0	**266**	**241**
Conventionals												
Total Organic Carbon (mg/kg)	--	4000	15000	17000	9900	16000	21000	8400	19000	15000	20000	15000

Table 2-3
ROW Soil Sample Results
Former PWT Site
Ridgefield, Washington

Location	MTCA Method B Soil CUL	ROW013	ROW014	ROW014	ROW014	ROW016	ROW016	ROW016	ROW018	ROW018	ROW019	ROW019
Sample ID		SBS-ROW013-2.0	SS-ROW014-0.5	SS-ROW014-1.0	SBS-ROW014-2.0	SS-ROW016-0.5	SBS-ROW016-1.0	SBS-ROW016-2.0	SS-ROW018-0.5	SBS-ROW018-1.0	SS-ROW019-0.5	SBS-ROW019-1.0
Sample Date		09/01/2015	04/23/2015	04/23/2015	08/26/2015	06/08/2015	06/08/2015	09/01/2015	06/08/2015	06/08/2015	06/08/2015	06/08/2015
Sample Type		Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
Sample Depth (feet bgs)		1.5-2.0	0-0.5	0.5-1.0	1.5-2.0	0-0.5	0.5-1.0	1.5-2.0	0-0.5	0.5-1.0	0-0.5	0.5-1.0
Dioxins and Furans (ng/kg)												
1,2,3,4,6,7,8-HpCDD	--	248	11100	2400	271	665	861	113	521	298	673	437
1,2,3,4,6,7,8-HpCDF	--	40.3	1700	358	42.4	105	115	14.9	84.3	50.5	93.5	69.1
1,2,3,4,7,8,9-HpCDF	--	2.41	99.9	19.1	2.35	5.25	8.26	0.89 J	5.87	3.27	5.15	4.74
1,2,3,4,7,8-HxCDD	--	2.42	88.6	17.7	2.5	8.74	11	1.39	7.71	3.61	7.15	4.82
1,2,3,4,7,8-HxCDF	--	8.01	403	80.7	9.42	17.3	24.6	2.63	7.33	4.23	19.6	16.2
1,2,3,6,7,8-HxCDD	--	12	569	98.9	12.3	34.2	50.5	5.02	22.8	15.9	31.9	24.1
1,2,3,6,7,8-HxCDF	--	3.06	161	32.1	3.61	8.35	11.3	1.45	4.41	2.22 U	7.93	6.27
1,2,3,7,8,9-HxCDD	--	6.92	208	42.4	6.41	23.6	28.1	4.1	20.4	11.3	20.1	13.2
1,2,3,7,8,9-HxCDF	--	0.159 J	6.69	1.3	0.174 J	0.353 J	0.419 J	0.102 U	0.216 J	0.103 U	0.473 J	0.24 J
1,2,3,7,8-PeCDD	--	0.671 J	25.1	4.54	0.707 J	4.05	4.9 U	0.452 J	3.29	1.62	3.23	1.66
1,2,3,7,8-PeCDF	--	1.08	47.7	8.48	1.33	2.78	3.58	0.344 J	1.31	0.776 J	2.77	1.62
2,3,4,6,7,8-HxCDF	--	2.12	88.3	17.8	2.13	5.23	6.65	1.47	2.71	1.61	4.55	3.78
2,3,4,7,8-PeCDF	--	1.15	69.7	12.7	1.58	4.09	4.92	0.642 J	1.54	0.918 J	4.11	2.55
2,3,7,8-TCDD	--	0.109 U	1.36	0.217 U	0.109 U	0.435	0.426 J	0.101 U	0.396	0.249 J	0.803	0.333 J
2,3,7,8-TCDF	--	0.38 J	11.2	1.97	0.24 U	1.56	0.11 U	0.17 J	0.87 J	1.1 U	1.21	0.64 J
OCDD	--	1520	66200	15300	1730	3860	4460	578	2910	1650	3540	2400
OCDF	--	49.6	1440	262	39.2	133	112	16.8	199	104	87.4	46.3
Total HpCDDs	--	449	18900	4080	482	1200	1540	204	916	526	1080	735
Total HpCDFs	--	107	4370	897	110	270	320	36.2	251	168	229	178
Total HxCDDs	--	59.2	2190	418	57	190	246	28.3	146	85.2	144	103
Total HxCDFs	--	96.5	4700	915	111	213	306	42.7	115	61.8	192	163
Total PeCDDs	--	2.29	104	20	2.43	21.8	25	2.25	18.5	8.45	12.4	6.57
Total PeCDFs	--	13.6	1100	241	13.6	43.9	134	12.3	18.7	22.3	30.8	48.2
Total TCDDs	--	0.109 U	8.54	1.64	0.109 U	1.87	5.22	0.101 U	2.49	2.71	1.28	0.892 J
Total TCDFs	--	2.04	64.8	18.7	1.2	5.38	20.6	2.22	6.25	9.88	2.41	4.26
Total TEQ Mammals (U=1/2	**13**	7.99	**352**	**70.4**	8.63	**24.7**	**28.9**	3.80	**17.9**	10.0	**23.4**	**15.6**
Conventionals												
Total Organic Carbon (mg/kg)	--	6800	19000	11000	8400	20000	18000	3800	19000	18000	14000	10000

Table 2-3
ROW Soil Sample Results
Former PWT Site
Ridgefield, Washington

Location	MTCA Method B Soil CUL	ROW019	ROW019	ROW022	ROW022	ROW022	ROW022W	ROW022W	ROW022E	ROW022E	ROW023	ROW023
Sample ID		SBS-ROW019-1.5	SBS-ROW019-2.0	SS-ROW022-0.5	SBS-ROW022-1.0	SBS-ROW022-1.5	SS-ROW022W-0.5	SBS-ROW022W-1.5	SS-ROW022E-0.5	SS-ROW022E-0.5-DUP	SS-ROW023-0.5	SBS-ROW023-1.0
Sample Date		08/26/2015	09/01/2015	06/08/2015	06/08/2015	08/26/2015	11/02/2015	11/02/2015	11/02/2015	11/02/2015	06/08/2015	06/08/2015
Sample Type		Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete Dup	Discrete	Discrete
Sample Depth (feet bgs)		1.0-1.5	1.5-2.0	0-0.5	0.5-1.0	1.0-1.5	0-0.5	1.0-1.5	0-0.5	0-0.5	0-0.5	0.5-1.0
Dioxins and Furans (ng/kg)												
1,2,3,4,6,7,8-HpCDD	--	1220	229	572	600	174	1750	154	1250	1600	1240	1080
1,2,3,4,6,7,8-HpCDF	--	197	40.2	84.6	107	28.4	342	27.6	224	218	284	240
1,2,3,4,7,8,9-HpCDF	--	10.5	2.14	4.88	7.29	1.83	20.1	1.83	13.6	14.3	21.4	19.5
1,2,3,4,7,8-HxCDD	--	12.8	2.18	7.19	8.06	2.31	21.4	1.44	14.9	14.3	17	14
1,2,3,4,7,8-HxCDF	--	40.9	9.1	11.3	15.7	4.1	47.7	3.41	39.5	41.1	20.2	21.8
1,2,3,6,7,8-HxCDD	--	54.8	11.3	26.2	36.5	8.1	84.4	6.35	67.5	72.6	53.6	60.6
1,2,3,6,7,8-HxCDF	--	16	3.39	5.68	7.71	2.75	23.3	1.85	17	19.6	9.45	10.2
1,2,3,7,8,9-HxCDD	--	31.3	5.91	20.1	24.3	6.42	44.6	3.51	34.9	35.1	42.5	37.5
1,2,3,7,8,9-HxCDF	--	0.526 J	0.194 J	0.278 J	0.311 J	0.119 J	0.755 J	0.105 U	0.56 J	0.717 J	0.439 J	0.41 J
1,2,3,7,8-PeCDD	--	4.13	0.749 J	2.98	3.54	1.11	5.6 J	0.505 J	4.13	4.62	6.08	6.75
1,2,3,7,8-PeCDF	--	4.95	1.02	1.79	2.34	0.648 J	5.24 J	0.471 J	4.69	5.02	2.34	2.81 U
2,3,4,6,7,8-HxCDF	--	10.2	1.92	3.71	5.08	2.68	15.3	1.44	11.2	12.7	6.75	6.76
2,3,4,7,8-PeCDF	--	6.79	1.54	2.76	3.57	1.4	8.53 J	0.975 J	7.66	8.08	3.09	3.74
2,3,7,8-TCDD	--	0.796	0.1 U	0.43	0.352 J	0.193 U	1.32 J	0.161 J	0.432	0.449	0.484	0.466 J
2,3,7,8-TCDF	--	1.31	0.28 J	1.18	2.05	0.67 J	1.66 J	0.21 U	1.42	1.35	1.11	1.7 U
OCDD	--	8410	1660	3220	3000	1170	13300	1130	3690	3210	6530	5150
OCDF	--	160	28.4	193	173	61.6	920	73.3	324	325	783	469
Total HpCDDs	--	2190	391	987	1040	329	2900	265	2060	2760	1970	1740
Total HpCDFs	--	493	96.9	237	320	77	1010	78.6	624	597	946	852
Total HxCDDs	--	277	50.5	142	179	55.1	418	31.5	310	319	277	278
Total HxCDFs	--	488	95	156	196	87.4	617	52.4	459	483	285	331
Total PeCDDs	--	17.3	2.52	15.4	18.9	7.03	35.6	2.7	21.9	18.1	26.1	30.9
Total PeCDFs	--	70.3	15.5	29.8	95.9	32.1	288	31.8	220	199	23.7	66.1
Total TCDDs	--	2.98	0.14 J	3.04	3.38	1.94	9.47	1.07	5.28	5.41	2.76	4.08
Total TCDFs	--	13.4	2.63	12.3	27.1	12.9	62.9	8.05	38.1	28.7	5.01	15
Total TEQ Mammals (U=1/2	**13**	**40.7**	7.94	**19.5**	**23.1**	6.77	**58.9**	4.98	**41.8**	**46.8**	**40.3**	**38.7**
Conventionals												
Total Organic Carbon (mg/kg)	--	9100	4000	21000	16000	14000	16000	12000	15000	14000	24000	16000

Table 2-3
ROW Soil Sample Results
Former PWT Site
Ridgefield, Washington

Location	MTCA Method B Soil CUL	ROW023	ROW023	ROW025	ROW025	ROW025	ROW026	ROW026	ROW026	ROW026	ROW029B	ROW029B
Sample ID		SBS-ROW023-1.5	SBS-ROW023-2.0	SS-ROW025-0.5	SBS-ROW025-1.0	SBS-ROW025-1.5	SS-ROW026-0.5	SBS-ROW026-1.0	SBS-ROW026-1.5	SBS-ROW026-2.0	SS-ROW029B-0.5	SBS-ROW029B-1.0
Sample Date		09/01/2015	09/01/2015	06/08/2015	06/08/2015	08/26/2015	05/21/2015	05/21/2015	08/26/2015	08/26/2015	06/08/2015	06/08/2015
Sample Type		Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
Sample Depth (feet bgs)		1.0-1.5	1.5-2.0	0-0.5	0.5-1.0	1.0-1.5	0-0.5	0.5-1.0	1.0-1.5	1.5-2.0	0-0.5	0.5-1.0
Dioxins and Furans (ng/kg)												
1,2,3,4,6,7,8-HpCDD	--	263	71.4	1430	395	207	424	653	460	232	990	523
1,2,3,4,6,7,8-HpCDF	--	101	21.3	186	60.8	34.9	72.2	131	83.5	44.1	152	84.4
1,2,3,4,7,8,9-HpCDF	--	6.57	1.71	12.1	4.26	2.37	3.8	6.46	4.72	2.47	9.96	6.76
1,2,3,4,7,8-HxCDD	--	2.97	0.741 J	22.3	5.44	3.77	5.27	7.46	5.75	2.68	16.2	8.12
1,2,3,4,7,8-HxCDF	--	6.21	1.3	17.5	6.64	4.73	8.48	16.1	15.2	8.03	17.4	11.8
1,2,3,6,7,8-HxCDD	--	11.9	2.6	63.6	22.4	12.2	18.8	36.2	24.9	11.9	45.4	28.9
1,2,3,6,7,8-HxCDF	--	2.62	0.626 J	10.9	4.16	2.38	3.95	7.05	6.62	3.44	8.97	5.98 U
1,2,3,7,8,9-HxCDD	--	8.04	2.36	55.6	15.5	9.28	13.1	23.3	15.6	7.87	43.2	21.7
1,2,3,7,8,9-HxCDF	--	0.136 J	0.106 U	0.456 J	0.19 J	0.458 J	0.22 J	0.284 J	0.229 J	0.218 J	0.366 J	0.268 J
1,2,3,7,8-PeCDD	--	1.02	0.315 J	8.46	2.62	2.08	2.59	3.5	2.69	1.11	6.05	3.69
1,2,3,7,8-PeCDF	--	0.617 J	0.149 J	2.99	1.11	1.21	1.42	2.43	2.31	1.18	2.39	1.66
2,3,4,6,7,8-HxCDF	--	1.95	0.543 J	6.85	2.81	1.98	2.1	4.12	3.88	1.93	6.46	3.46
2,3,4,7,8-PeCDF	--	0.95	0.264 J	3.59	1.4	1.2	1.88	3.09	3.19	1.68	3.45	2.45
2,3,7,8-TCDD	--	0.106 U	0.106 U	0.715	0.188 U	0.253	0.494 J	0.566	0.451	0.213	0.573	0.342 J
2,3,7,8-TCDF	--	0.18 U	0.15 U	1.73	0.787 J	0.59 J	0.937 J	1.52	1.16	0.62	1.34	1.32
OCDD	--	1880	462	8360	1930	1250	2470	3190	2640	1610	5360	2540
OCDF	--	346	81.8	385	87.7	58.6	77.8	102	89.4	43.7	311	127
Total HpCDDs	--	411	115	2390	666	384	749	1100	845	389	1810	995
Total HpCDFs	--	365	76.9	512	174	95.2	175	309	223	107	424	250
Total HxCDDs	--	57.4	15.2	373	118	64.9	106	181	131	60.7	303	174
Total HxCDFs	--	113	23.8	285	97.4	59.4	103	201	179	82.5	209	145
Total PeCDDs	--	4.41	1.26	41.7	12.5	8.27	15.4	19.4	17.5	6.98	31.5	15.3
Total PeCDFs	--	12.3	2.94	47.8	41	10.1	20.4	37	29.2	16.5	37.7	60.6
Total TCDDs	--	1.41	0.215	6.55	2.19	1.16	4.57	5.07	3.85	1.83	4.35	3.73
Total TCDFs	--	3.72	0.779	17.9	12	3.99	8.44	12.8	12.6	5.34	10.9	14.9
Total TEQ Mammals (U=1/2	**13**	9.14	2.39	**47.1**	**14.2**	9.10	**14.7**	**23.6**	**17.8**	8.81	**34.9**	**19.6**
Conventionals												
Total Organic Carbon (mg/kg)	--	10000	11000	21000	13000	9200	20000	12000	9600	7900	16000	16000

Location	MTCA Method B Soil CUL	ROW029B	ROW029BS	ROW029BS	ROW030	ROW030	ROW033W	ROW033W	ROW036	ROW036	ROW038S
Sample ID		SBS-ROW029B-1.5	SS-ROW029BS-0.5	SBS-ROW029BS-1.5	SS-ROW030-0.5	SS-ROW030-1.0	SS-ROW033W-0.5	SBS-ROW033W	SS-ROW036-0.5	SS-ROW036-1.0	SS-ROW038S-0.5
Sample Date		08/26/2015	11/02/2015	11/02/2015	04/30/2015	04/30/2015	11/02/2015	11/02/2015	04/23/2015	04/23/2015	11/02/2015
Sample Type		Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
Sample Depth (feet bgs)		1.0-1.5	0-0.5	1.0-1.5	0-0.5	0.5-1.0	0-0.5	1.0-1.5	0-0.5	0.5-1.0	0-0.5
Dioxins and Furans (ng/kg)											
1,2,3,4,6,7,8-HpCDD	--	300	990	55.6	430	199	999	463	363	13	107
1,2,3,4,6,7,8-HpCDF	--	51.4	197	8.46	70.2	23.9	248	107	61.6	2.78	19.1
1,2,3,4,7,8,9-HpCDF	--	3.36	14.5	0.797 J	3.52	1.53	15.1	8.1	5.37	0.214 J	1 J
1,2,3,4,7,8-HxCDD	--	3.5	13.3	0.608 J	6.25	3.05	14.7	6.1	6.07	0.266 J	1.52 J
1,2,3,4,7,8-HxCDF	--	5.56	26.3	1.31	8.45	3.63	36.5	22.4	5.95	0.447 J	1.8 J
1,2,3,6,7,8-HxCDD	--	12.1	50.3	2.37	21.4	9.45	58.3	25.5	14.1	0.539 J	4.9 J
1,2,3,6,7,8-HxCDF	--	2.79	9.76 J	0.54 J	4.38	1.84	32	22.3	3.26	0.261 J	0.84 J
1,2,3,7,8,9-HxCDD	--	9.61	33.8	1.69	20.9	7.98	36.3	13.5	15.5	0.555 J	4.65 J
1,2,3,7,8,9-HxCDF	--	0.132 J	0.409 J	0.124 J	0.151 J	0.275 J	0.586 J	0.278 J	0.22 U	0.0983 UJ	0.221 U
1,2,3,7,8-PeCDD	--	1.57	4.78 J	0.271 J	2.78	1.67	8.08 J	3.81	3.88	0.183 J	0.638 J
1,2,3,7,8-PeCDF	--	0.786 J	2.6 J	0.261 J	1.24	0.703 J	5.13 J	3.17	0.84	0.146 U	0.21 U
2,3,4,6,7,8-HxCDF	--	2.28	7.11 J	0.371 J	2.71	1.19	34.7	25.7	2.46	0.27 J	0.672 J
2,3,4,7,8-PeCDF	--	1.15	3.81 J	0.276 J	1.47	0.934 J	16.2	12	3.96	0.205 J	0.261 U
2,3,7,8-TCDD	--	0.206	1.31 J	0.304	0.296	0.158 J	1.15 J	0.604	0.913	0.114 U	0.186 U
2,3,7,8-TCDF	--	0.61 J	1.82 J	0.19 J	0.495	0.34 U	3.27	1.82	2.11 U	0.24 U	0.302 J
OCDD	--	2010	7820	365	976	924	7780	2880	2520	99.2	803
OCDF	--	144	467	20.9	85.7	32.4	637	202	223	7.13	45.1
Total HpCDDs	--	579	1610	94.8	702	322	1720	849	630	24.1	190
Total HpCDFs	--	161	580	24.6	182	60.1	763	304	212	7.55	51.7
Total HxCDDs	--	80.9	242	11.9	122	50.9	335	154	109	4.13	30.1
Total HxCDFs	--	92.8	281	12.5	96.8	42	1040	780	87.2	5.3	23.7
Total PeCDDs	--	9.66	21.5	0.753 J	13.8	6.13	59.3	38.4	22.2	0.796 J	1.76 J
Total PeCDFs	--	19.2	84.1	4.86	15	11.6	1270	1010	39.7	3.47	5.69 J
Total TCDDs	--	1.02	6.54	0.663	2.4	1.04	18.5	12.7	3.9	0.944	0.253 J
Total TCDFs	--	4.84	18.2	1.46	4.79	2.29	373	277	60.3	3.68	1.07 J
Total TEQ Mammals (U=1/2	**13**	10.0	**36.1**	2.15	**15.4**	7.42	**51.0**	**26.6**	**16.0**	0.751	3.78
Conventionals											
Total Organic Carbon (mg/kg)	--	13000	15000	9200	15000	9400	22000	14000	12000	11000	17000

NOTES:

Bold indicates values that exceed MTCA Method B Soil CUL.

-- = no value.

bgs = below ground surface.

CUL = cleanup level.

EDL = estimated detection limit.

J = Estimated value. Value used in calculations.

mg/kg = milligrams per kilogram.

MTCA = Model Toxics Control Act.

ng/kg = nanograms per kilogram.

PWT = Pacific Wood Treating Co.

ROW = right-of-way.

TEQ = toxicity equivalent.

U = Not detected. One half the reported concentration used in TEQ calculations.

Table 4-1
Yard Cleanup Summary
Former PWT Site
Ridgefield, Washington

Property	Cleanup Needed?	Cleanup Depth	Depth Basis	Additional Confirmation Samples
001	Yes	Undetermined	Subsurface sample to be collected at 002.	--
002	Yes	Undetermined	Subsurface sample to be collected at 002.	1.0-1.5 ft (Analyze) 1.5-2.0 ft (Archive)
003	Yes	Undetermined	Subsurface sample to be collected at 002.	--
004	No	--	--	--
005	Yes	1.5 ft	Subsurface sample collected from 1.5-2.0 ft at ROW 005.	--
006	Yes	1.5 ft	Subsurface sample collected from 1.5-2.0 ft at ROW 006.	--
007	Yes	1.5 ft	Subsurface sample collected from 1.5-2.0 ft at ROW 007.	--
008	No	--	--	--
009	No	--	--	--
010	No	--	--	--
011	No	--	--	--
012	Yes	1.0 ft	Dioxin level at 0 to 0.5 ft is close to cleanup level, and the rest of this block does not require cleanup.	--
013	Yes	1.5 ft	Subsurface samples collected from 1.5-2.0 ft at 013, 014, and 016 ROWs.	--
014	Yes	1.5 ft	Subsurface samples collected from 1.5-2.0 ft at 013, 014, and 016 ROWs	--
015	Yes	1.5 ft	Subsurface samples collected from 1.5-2.0 ft at 013, 014, and 016 ROWs.	--
016	Yes	1.5 ft	Subsurface samples collected from 1.5-2.0 ft at 013, 014, and 016 ROWs.	--
017	Yes	1.0 ft	Subsurface sample collected at 0.5-1.0 ft.	--
018	Yes	1.0 ft	Subsurface sample collected at 0.5-1.0 ft.	--
019	Yes	Undetermined	Subsurface sample to be collected from property 019.	1.0-1.5 ft (Analyze) 1.5-2.0 ft (Archive)
020A	Yes	1.0 ft	Subsurface sample collected at property 020B.	--
020B	Yes	1.0 ft	Subsurface sample collected at 0.5-1.0 ft.	--

Table 4-1
Yard Cleanup Summary
Former PWT Site
Ridgefield, Washington

Property	Cleanup Needed?	Cleanup Depth	Depth Basis	Additional Confirmation Samples
021	No	--	--	--
022	No	--	--	--
023	Undetermined	Undetermined	Undetermined.	--
024	Yes	1.0 ft	Subsurface sample collected from 1.0-1.5 ft at ROW025 (directly adjacent and contiguous with yard 025).	--
025	Yes	1.0 ft	Subsurface sample collected from 1.0-1.5 ft at ROW025 (directly adjacent and contiguous with yard 025).	--
026	No	--	--	--
027	No	--	--	--
028A	No	--	--	--
028B	Yes	Undetermined	Subsurface sample to be collected at property 028B.	1.0-1.5 ft (Analyze) 1.5-2.0 ft (Archive)
029A	Yes	Undetermined	Subsurface sample to be collected at property 028B.	--
029B	Yes	Undetermined	Subsurface sample to be collected at property 028B.	--
030	No	--	--	--
031	No	--	--	--
032	Yes	1.0 ft	Subsurface sample collected at 0.5-1.0 ft.	--
033	No	--	--	--
034	No	--	--	--
035	Yes	Undetermined	Subsurface sample collected at property 032 and to be collected at property 037.	--
036	Yes	Undetermined	Subsurface sample collected at property 032 and to be collected at property 037.	--
037	Yes	Undetermined	Subsurface sample collected at property 032 and to be collected at property 037.	1.0-1.5 ft (Analyze) 1.5-2.0 ft (Archive)

Table 4-1
Yard Cleanup Summary
Former PWT Site
Ridgefield, Washington

Property	Cleanup Needed?	Cleanup Depth	Depth Basis	Additional Confirmation Samples
038	Yes	Undetermined	Subsurface sample collected at property 032 and to be collected at property 037.	--
039	Yes	Undetermined	Subsurface sample collected at property 032 and to be collected at property 037.	--

NOTES:

ROW vertical extent samples are considered conservative surrogates for nearby yard vertical extents. ROW surface and subsurface concentrations are generally higher than in nearby yards and therefore likely overestimate, rather than underestimate, subsurface concentrations in nearby yards. See text for further details.

-- = not applicable.

ft = feet.

PWT = Pacific Wood Treating Co.

ROW = right-of-way.

Table 4-2
ROW Cleanup Summary
Former PWT Site
Ridgefield, Washington

ROW Area	Cleanup Depth (ft)	Depth Basis	Additional Confirmation Samples
Block 001-007			
North	--	ROW samples are below the cleanup level on Maple Street.	--
West	1.5	Based on ROW subsurface sample results on this block.	--
South	1.5	Based on ROW subsurface sample results on this block.	--
East	1.0	Based on ROW subsurface sample results on this block.	--
Northwest of Railroad Avenue and Division Street Intersection			
Railroad Avenue West	Undetermined	Collect ROW sample to confirm need for soil cleanup.	ROW RR West 0-0.5 ft (Analyze) 0.5-1.0 ft (Archive) 1.0-1.5 ft (Archive) 1.5-2.0 ft (Analyze)
Block 008-012			
North	--	ROW samples are below the cleanup level on Maple Street.	--
West	Undetermined	Collect ROW sample near property 011 to confirm west and south soil cleanup depth.	--
South	Undetermined	Collect ROW sample near property 011 to confirm west and south soil cleanup depth.	ROW 011 0-0.5 ft (Analyze) 0.5-1.0 ft (Archive) 1.0-1.5 ft (Analyze) 1.5-2.0 ft (Archive)
East	1.0	Based on ROW subsurface sample results on this block.	--
Block 013-018			
North	1.5	Based on ROW subsurface sample results on this block.	--
West	1.5/1.0	1.5 ft south from Division Street to property 017 northern property line. 1.0 ft south from property 017 northern property line to Ash Street. Based on ROW and yard depth samples on this block.	--
South	1.0	Based on ROW subsurface sample results on this block.	--

Table 4-2
ROW Cleanup Summary
Former PWT Site
Ridgefield, Washington

ROW Area	Cleanup Depth (ft)	Depth Basis	Additional Confirmation Samples
East	1.5/1.0	1.5 ft south from Division Street to property 018 northern property line. 1.0 ft south from property 018 northern property line to Ash Street. Based on ROW and yard depth samples on this block.	--
Block 019-022			
North	1.5	Based on ROW subsurface sample results on this block.	--
West	1.0	Based on ROW subsurface sample results on this block.	--
South	1.0	Based on ROW subsurface sample results on this block.	--
East	1.0	Based on ROW subsurface sample results on this block.	--
Block 023-029B			
North	1.0	Based on ROW subsurface sample results on this block.	--
West	1.5/1.0	1.5 ft south from Ash St to property 028A northern property line, 1.0 ft south from property 028A northern property line to Mill Street. Based on ROW samples on this block.	--
South	1.0	Based on ROW subsurface sample results on this block.	--
East	1.0	Based on ROW subsurface sample results on this block.	--
Block 030-039			
North	1.0	Based on ROW subsurface sample results on this block.	--
West	1.0	Based on ROW subsurface sample results on this block.	--
South	1.0	Based on ROW subsurface sample results on this block.	--
East	1.5	Based on ROW 033 subsurface sample results and dioxins were not detected in 1.5- to 2.0-ft interval in ROWs.	--

NOTES:

Dioxins were not detected in 1.5 to 2.0-ft soil sample intervals throughout the neighborhood.

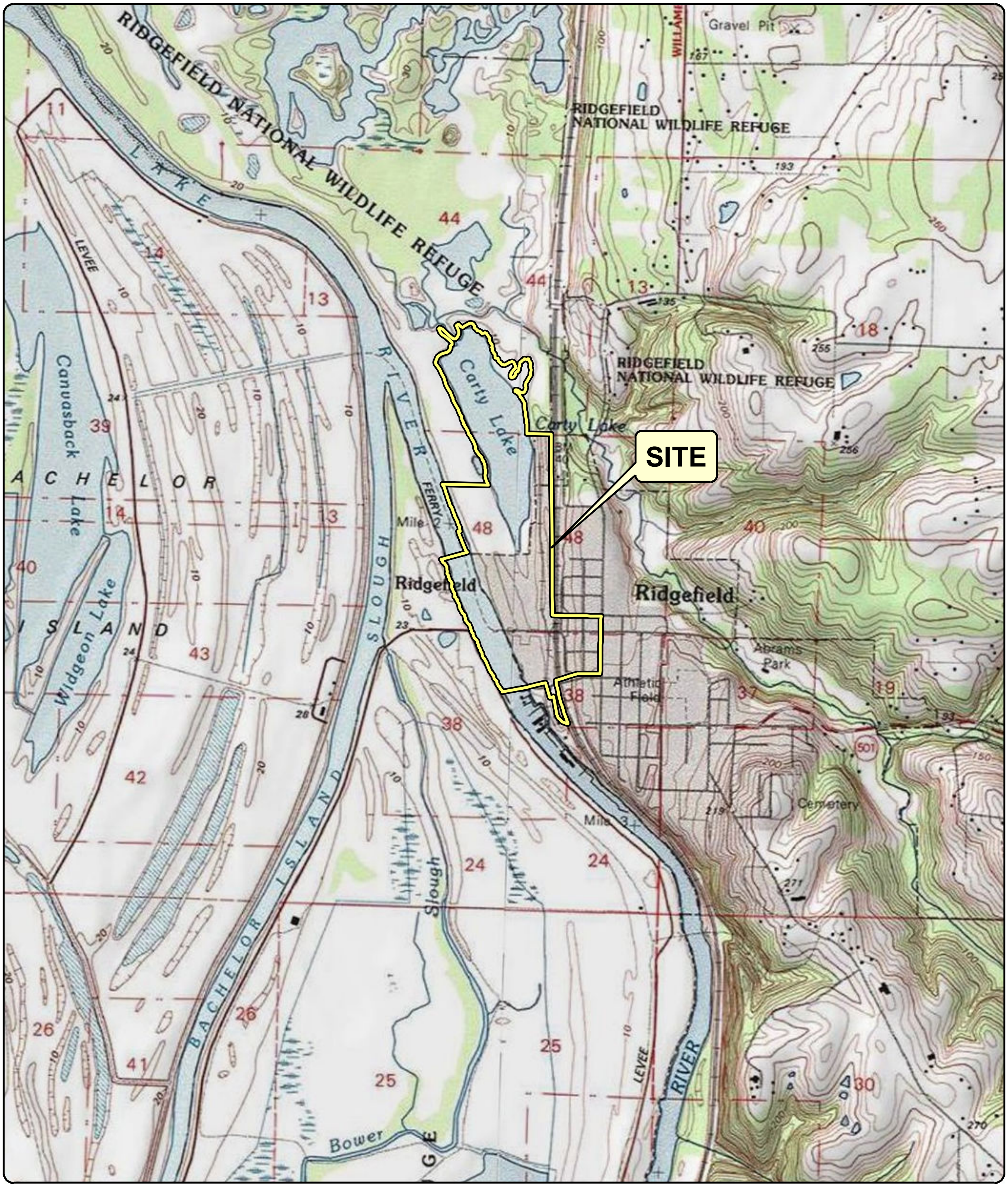
-- = not applicable.

ft = feet.

PWT = Pacific Wood Treating Co.

ROW = right-of-way.

FIGURES



Source: Topographic Quadrangle obtained from ArcGIS Online Services/NGS-USGS TOPO/US Geological Survey (1999)
7.5-minute topographic quadrangle: Ridgefield
Address: Lake River Industrial Site
111 W. Division Street, Ridgefield, WA 98642
Section: 24 Township: 4N Range: 1W Of Willamette Meridian

Legend

Former PWT Site

Figure 1-1
Site Location

Former PWT Site
Ridgefield, Washington

0 1,000 2,000
Feet

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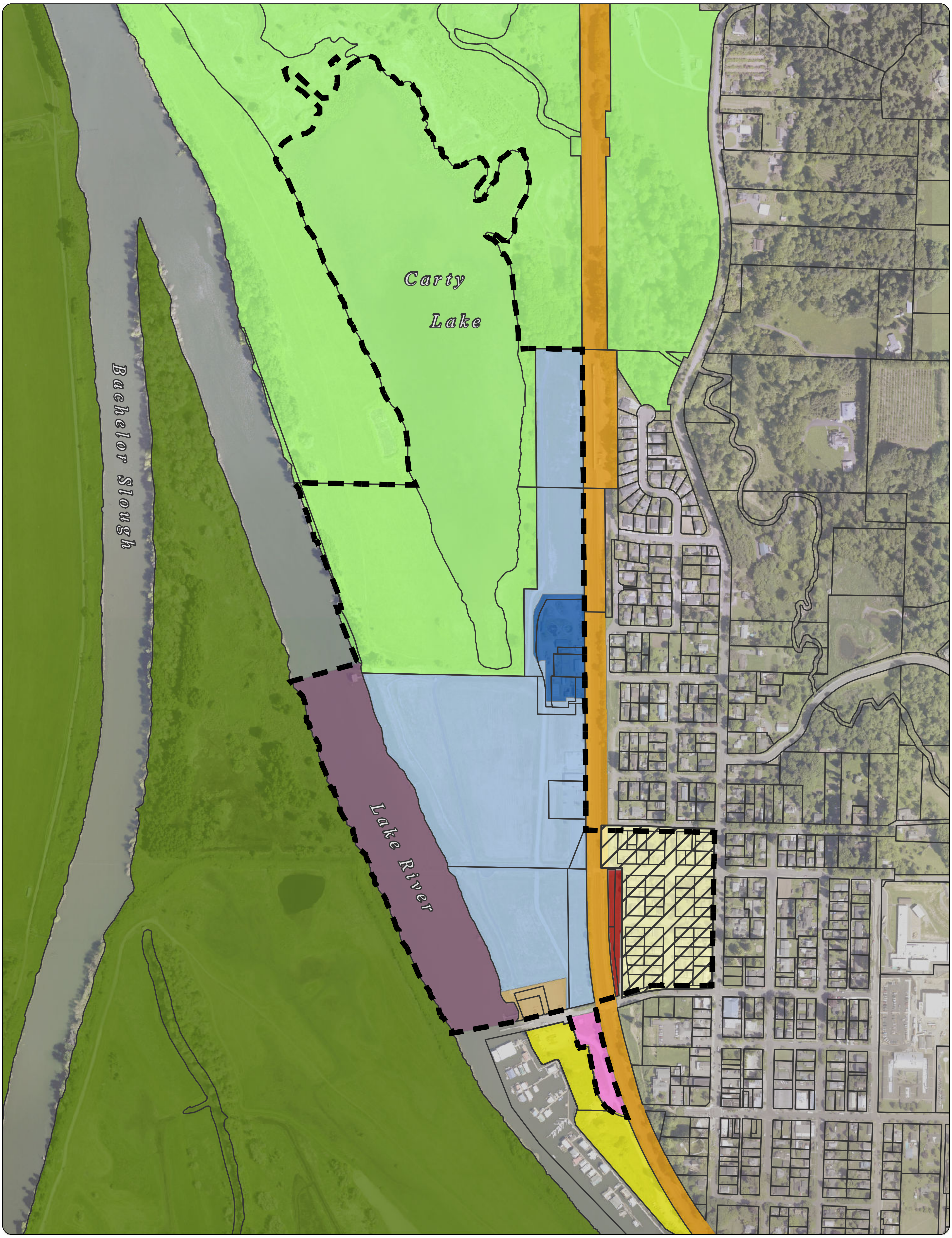
Path: X:\9003.01 Port of Ridgefield\39\Off-Property Yard Sampling\Projects\Interim Action Plan\Fig1-1_Site Location.mxd Print Date: 1/13/2016 Approved By: pwiescher Produced By: jschane Project: 9003.01.39



Source: Aerial photograph (2014) and tax lots obtained from Clark County GIS.

Notes:
1. BNSF = Burlington Northern Sante Fe
2. LRIS = Lake River Industrial Site
3. Port = Port of Ridgefield
4. RNWR = Ridgefield National Wildlife Refuge
5. WWTP = wastewater treatment plant

Legend

- Pacific Wood Treating Site
- Clark County Tax Lots (2014)
- Off-Property Portion

Area Designations

LRIS
- Port-Owned
- City of Ridgefield WWTP

Port-Owned
- Railroad Avenue Property
- Marina Property
- Overpass Property

Upland Off-Property
- Residential; Low-Density
- McCuddy's Marina Property

Other
- RNWR-Carty Unit
- RNWR-River S Unit
- BNSF Railroad Property
- Lake River

0 250 500
Feet

Figure 1-2
Site and Off-Property Portion Diagram

Former PWT Site
Ridgefield, Washington

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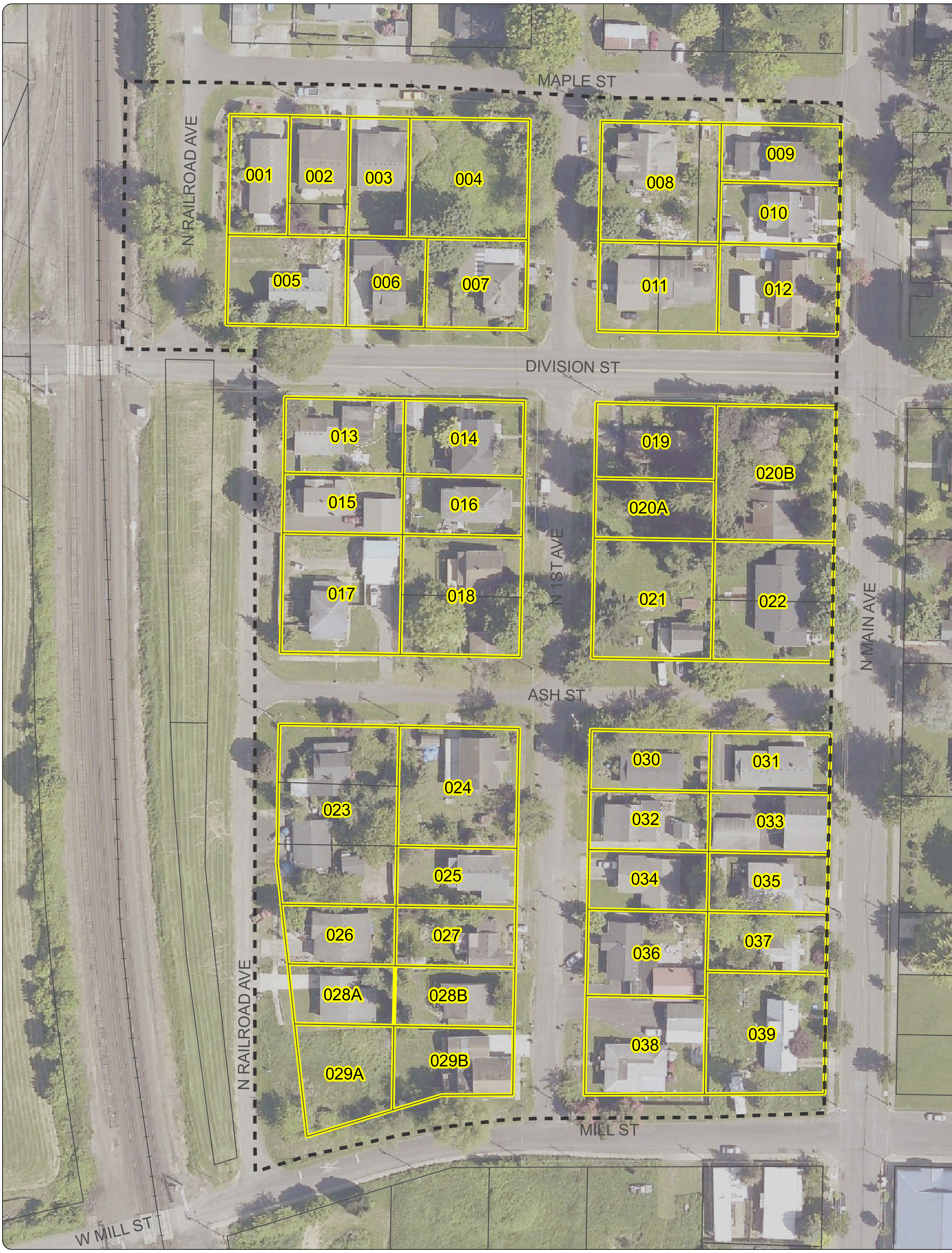
Path: X:\9003.01 Port of Ridgefield\39\Off-Property Yard Sampling\Projects\Interim Action Plan\Fig1-2_Site and Off-Property Portion Diagram.mxd
Print Date: 1/14/2016
Approved By: M. Novak
Produced By: J. Schane
Project: 9003.01.49



Source: Aerial photograph (2010) obtained from Esri ArcGIS Online. Taxlots (2014) from Clark County GIS.

Figure 2-1
Property and Tax Lot Boundaries

Former PWT Site
Ridgefield, Washington

Legend

- Off-Property Portion
- Property Boundary
- Taxlots

0 40 80
Feet

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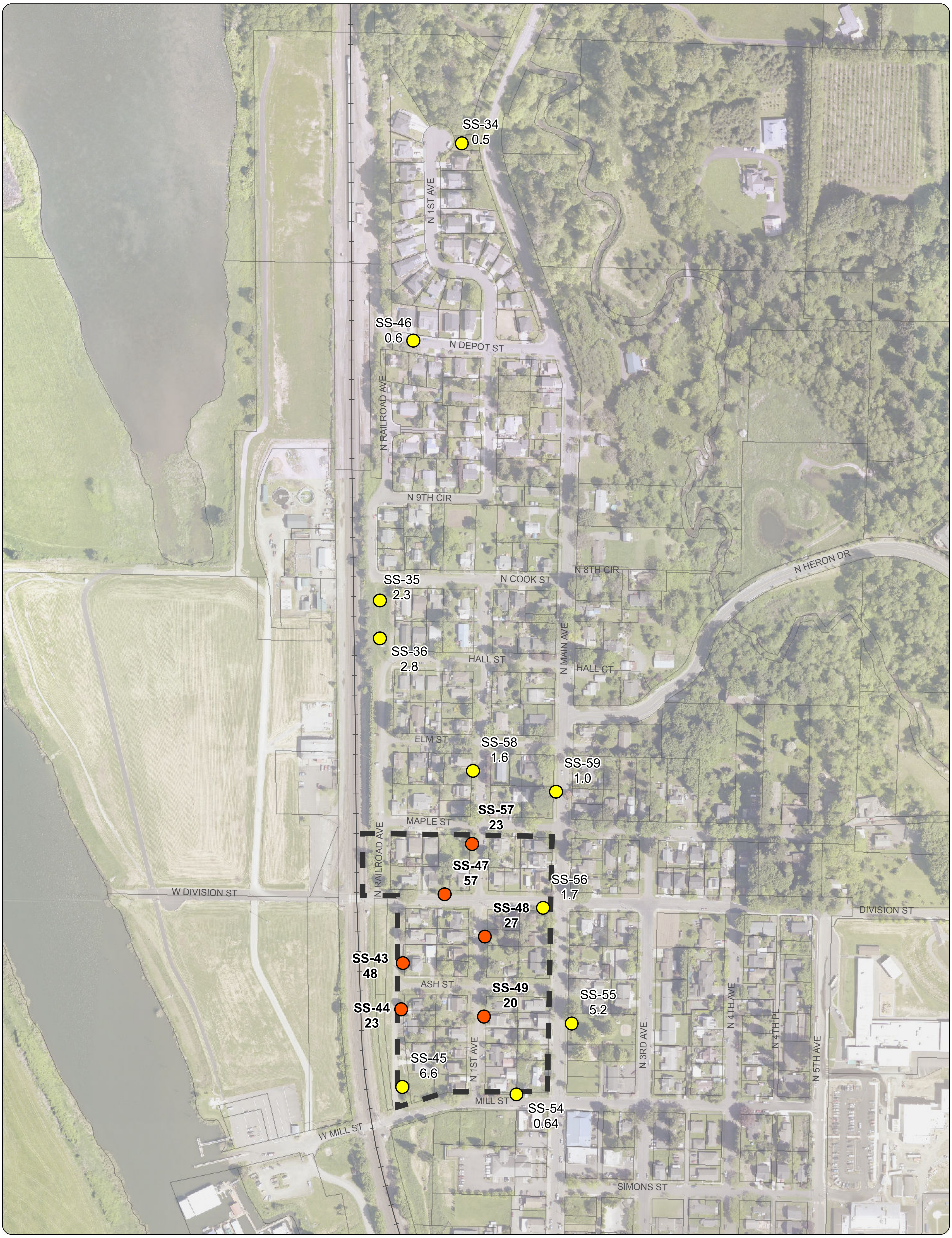
Path: X:\9003.01 Port of Ridgefield\39\Off-Property Yard Sampling\Projects\Interim Action Plan\Fig2-1_Property and Tax Lot Boundaries.mxd
Print Date: 1/14/2016
Approved By: pwlescher
Produced By: jschane
Project: 9003.01.39



Source: Aerial photograph (2013) obtained from the National Agriculture Imagery Program (NAIP). Tax lots (2014) from Clark County GIS.

CUL = cleanup level
MTCA = Model Toxics Control Act
ng/kg = nanograms per kilogram
TEQ = toxicity equivalent

Legend

Dioxin TEQ

- Below MTCA B CUL (< 13 ng/kg)
- Above MTCA B CUL (> 13 ng/kg)
- Off-Property Portion
- Clark County Tax Lots (2014)

0 150 300
Feet

Figure 2-2
ROW Surface Soil Sample Results (2010-2012)

Former PWT Site
Ridgefield, Washington

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Path: X:\9003.01 Port of Ridgefield\39\Off-Property Yard Sampling\Projects\Interim Action Plan\Fig2-2_ROW Surface Soil Sample Results.mxd
Print Date: 3/14/2016
Approved By: pwescher
Produced By: jschane
Project: 9003.01.39

Source: Aerial photograph (2014) obtained from Clark County GIS.

ISM = Incremental Sampling Methodology
ROW = right-of-way

One ISM sampling area was identified for each property, with the exception of 013 and 018. For these properties, a front yard (F) and backyard (B) sampling area was identified.

Legend

- 2015 ROW Sample
- 2010-2011 ROW Sample
- Discrete Subsurface Sample Location
- Composite Sample Location
- Composite Sampling Area
- ISM Sampling Area
- Front Yard ISM Sampling Area
- Backyard ISM Sampling Area
- Properties Sampled
- Properties Not Sampled
- Off-Property Portion

0 40 80
Feet

Figure 2-3 Off-Property Portion Sample Locations

Former PWT Site
Ridgefield, Washington

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Path: X:\9003.01 Port of Ridgefield\39\Off-Property Yard Sampling\Projects\Interim Action Plan\Fig2-3_Off-Property Portion Sampling Locations.mxd
Print Date: 3/15/2016
Approved By: P. Wiescher
Produced By: jschane
Project: 9003.01.39

Source: Aerial photograph obtained from Esri ArcGIS Online

Notes:
1. bgs = below ground surface.
2. **Bold** values indicate dioxin TEQ (toxicity equivalent) concentrations above the MTCA B (Model Toxics Control Act Method B) CUL (cleanup level) of 13 ng/kg (nanograms per kilogram).

Legend

- Discrete Subsurface Sample Location (0.5-1.0 ft bgs)
- ISM Sampling Area (0-0.5 ft bgs)
- Composite Sampling Area
- Property Boundaries
- Off-Property Portion

0 50 100
Feet

Figure 2-4
Yard Soil Sample Results

Former PWT Site
Ridgefield, Washington

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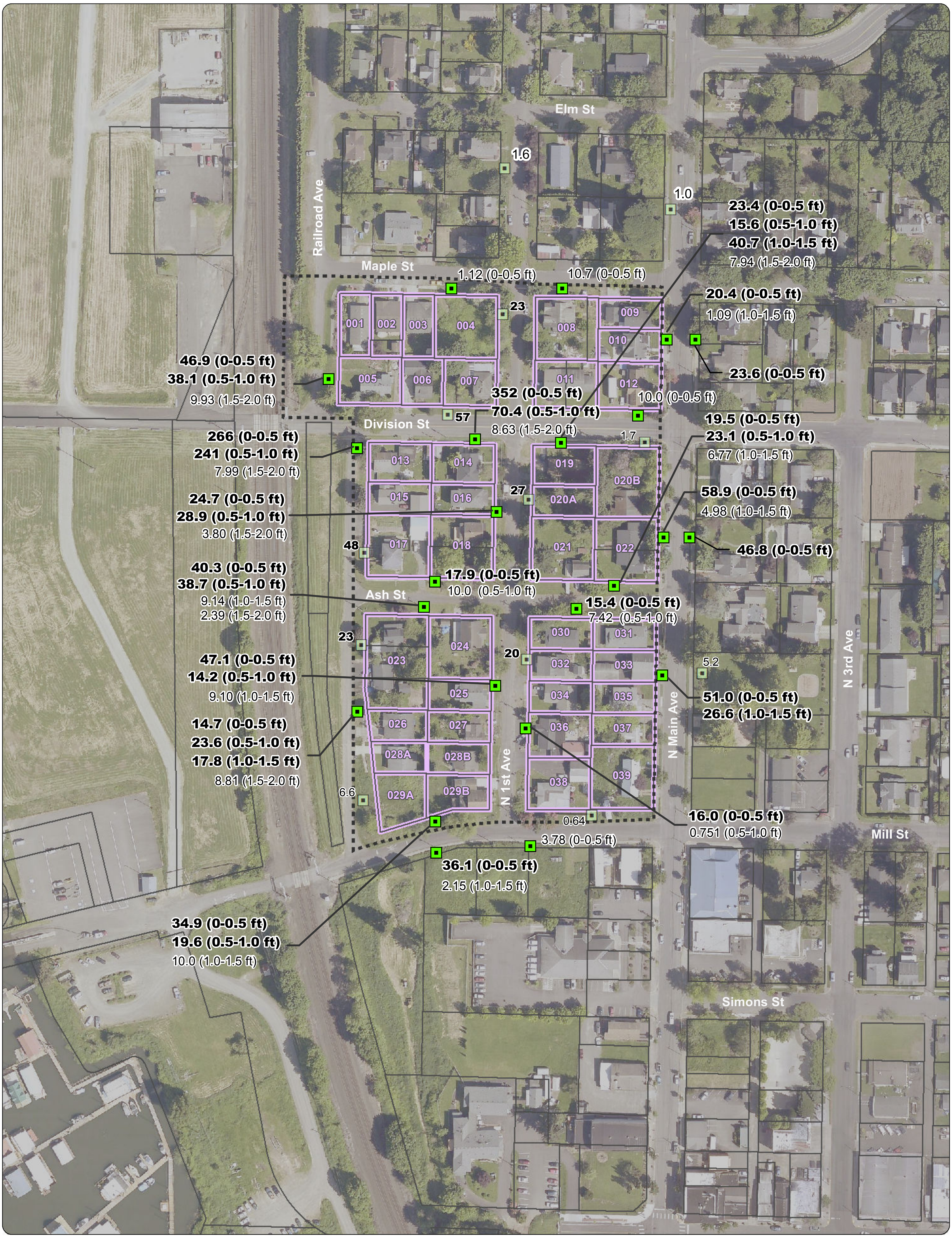
Path: X:\9003.01 Port of Ridgefield\39\Off-Property Yard Sampling\Projects\Interim Action Plan\Fig2-4_Yard Soil Sample Results.mxd
Print Date: 3/18/2016
Approved By: P. Wiescher
Produced By: jschane
Project: 9003.01.39



Source: Aerial photograph obtained from Esri ArcGIS Online; tax lots dataset obtained from Clark County GIS.

Notes:
1. bgs = below ground surface
2. **Bold** values indicate dioxin TEQ (toxicity equivalent) concentrations above the MTCA B (Model Toxics Control Act Method B) CUL (cleanup level) of 13 ng/kg (nanograms per kilogram).
3. ROW = right-of-way

Legend

- 2015 ROW Sample
- 2010-2011 ROW Sample (0-0.5 ft bgs)
- Property Boundary
- Off-Property Portion
- Tax Lot

Figure 2-5
ROW Soil Sample Results

Former PWT Site
Ridgefield, Washington

0 75 150
Feet

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Path: X:\9003.01 Port of Ridgefield\39\Off-Property Yard Sampling\Projects\Interim Action Plan\Fig2-5_ROW Soil Sample Results.mxd
Print Date: 3/18/2016
Approved By: P. Wiescher
Produced By: jschane
Project: 9003.01.39

Source: Aerial photograph (May 2014) obtained from Clark County GIS.

Figure 4-1
Interim Action Areas

Former PWT Site
Ridgefield, Washington

Legend

- Preliminary Cleanup Area (1' depth)
- Preliminary Cleanup Area (1.5' depth)
- Cleanup Depth to Be Determined
- No Cleanup (Properties below Cleanup Level)
- Properties Not Sampled
- Off-Property Portion

0 50 100
Feet

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Path: X:\9003.01 Port of Ridgefield\39\Off-Property Yard Sampling\Projects\Interim Action Plan\Fig4-1_Interim Action Areas.mxd
Print Date: 3/15/2016 Approved By: P. Wiescher Produced By: jschane Project: 9003.01.39

APPENDIX A
PROPERTY DATABASE

Appendix A
Property Database
Former PWT Site
Ridgefield, Washington

Property ID Number	Tax Lot Parcel Number	Property Address	Area (Sq Ft.)	Year Built	Most Recent Sale	Property Type Description
001	69314000	512 RAILROAD AVE, RIDGEFIELD, 98624	4,988	1994	2004	HOUSE
002	69312000	5 MAPLE ST, RIDGEFIELD, 98642	3,649	1996	1994	HOUSE
	69310000		1,345	NA	1994	NO BUILDING
003	69297000	7 MAPLE ST, RIDGEFIELD, 98642	5,021	1993	2013	HOUSE
004	69292000	NA (EMPTY LOT)	9,982	NA	2013	NO BUILDING
005	69315000	4 W DIVISION ST, RIDGEFIELD, 98642	7,482	1925	2013	HOUSE
006	69298000	8 DIVISION ST, RIDGEFIELD, 98642	4,952	1915	2008	HOUSE
007	69316000	14 DIVISION ST, RIDGEFIELD, 98642	6,315	1912	1998	HOUSE
008	69324000	512 N 1ST AVE, RIDGEFIELD, 98642	8,201	1930	1997	HOUSE
	69322000		1,799	NA	1997	NO BUILDING
009	69319000	515 N MAIN AVE, RIDGEFIELD, 98642	4,859	2004	2005	HOUSE
010	69318000	511 N MAIN AVE, RIDGEFIELD, 98642	5,142	1920	2013	HOUSE
011	69326000	100 DIVISION ST, RIDGEFIELD, 98642	3,752	NA	2005	NO BUILDING
	69328000		3,746	1988	2005	HOUSE
012	69330000	503 & 505 N MAIN AVE, RIDGEFIELD, 98642	7,493	1901	2008	HOUSE
013	69416000	5 DIVISION ST, RIDGEFIELD, 98642	6,297	1913	1996	HOUSE
014	69378000	413 N 1ST AVE, RIDGEFIELD, 98642	6,300	1920	2013	HOUSE
015	69414000	410 RAILROAD AVE, RIDGEFIELD, 98642	4,994	1920	2014	HOUSE
016	69380000	409 N 1ST AVE, RIDGEFIELD, 98642	5,001	1920	2011	HOUSE
017	69410000	6 ASH ST, RIDGEFIELD, 98642	10,001	1913	2012	HOUSE
018	69382000	405 N 1ST AVE, RIDGEFIELD, 98642	5,036	1920	2012	HOUSE
	69384000		4,960	1990	2012	DETACHED GARAGE
019	69348000	412 N 1ST AVE, RIDGEFIELD, 98642	6,301	1991	2004	HOUSE
020A	69350000	411 N MAIN AVE, RIDGEFIELD, 98642	5,001	NA	1996	NO BUILDING
020B	69340000		11,301	1911	Unknown	HOUSE
021	69352000	102 ASH ST, RIDGEFIELD, 98642	10,002	1950	1996	HOUSE
022	69344000	403 N MAIN AVE, RIDGEFIELD, 98642	5,002	1990	2013	HOUSE
	69346000	405 N MAIN AVE, RIDGEFIELD, 98642	5,001			

Property ID Number	Tax Lot Parcel Number	Property Address	Area (Sq Ft.)	Year Built	Most Recent Sale	Property Type Description
023	69406000	5 ASH ST, RIDGEFIELD, 98642	4,913	1920	2002	HOUSE
	69407000		5,088	2005	2003	DETACHED GARAGE
	69402000		4,926	NA	2002	NO BUILDING
024	69386000	327 N 1ST AVE, RIDGEFIELD, 98642	10,001	1927	2009	HOUSE
025	69390000	319 N 1ST AVE, RIDGEFIELD, 98642	5,002	1920	2012	HOUSE
026	69401000	314 N RAILROAD AVE, RIDGEFIELD, 98642	4,621	1995	2011	HOUSE
027	69392000	315 N 1ST AVE, RIDGEFIELD, 98642	5,000	1925	2004	HOUSE
028A	69394000	311 N 1ST AVE, RIDGEFIELD, 98642	9,305	1998	Unknown	HOUSE
028B	69394000			1918	Unknown	HOUSE
029A	69398000	305 N 1ST AVE, RIDGEFIELD, 98642	5,959	NA	2010	NO BUILDING
029B	69400000		6,386	1940	2010	HOUSE
030	69375000	101 ASH ST, RIDGEFIELD, 98642	5,005	1980	2006	HOUSE
031	69356000	105 ASH ST, RIDGEFIELD, 98642	5,000	1985	2005	HOUSE
032	69374000	322 N 1ST AVE, RIDGEFIELD, 98642	4,998	1920	2014	HOUSE
033	69358000	319 N MAIN AVE, RIDGEFIELD, 98642	4,792	Unknown	2004	HOUSE
		321 N MAIN AVE, RIDGEFIELD, 98642				
		323 N MAIN AVE, RIDGEFIELD, 98642				
034	69372000	318 N 1ST AVE, RIDGEFIELD, 98642	4,988	1995	2003	HOUSE
035	69362000	313 N MAIN AVE, RIDGEFIELD, 98642	4,995	1993	2003	HOUSE
036	69370000	314 N 1ST AVE, RIDGEFIELD, 98642	7,194	1920	2006	HOUSE
037	69364000	309 N MAIN AVE, RIDGEFIELD, 98642	4,997	1940	1999	HOUSE
038	69368000	304 N 1ST AVE, RIDGEFIELD, 98642	8,164	1925	2013	HOUSE
039	69366000	305 N MAIN AVE, RIDGEFIELD, 98642	10,145	1940	2006	HOUSE

APPENDIX B

DATA QUALITY MEMORANDA AND LABORATORY REPORTS

APPENDIX C
TECHNOLOGY SCREEN

General Response Action	Remedial Technology	Process Options	Description	Retained for Alternatives	Screening Comments
No Action	None	Not Applicable	No Action	No	A no-action alternative was considered and dismissed as an option because of human health and ecological exposure concerns.
Institutional Controls	Restrictions	Deed Notifications	Institutional controls are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Institutional controls are meant to supplement engineering controls.	No	This technology is not retained for further evaluation, as it is incompatible with current land use (residential neighborhood).
		Access / Fencing	Access restrictions such as fencing create a physical impedance in order to protect human receptors.	No	This technology is not retained for further evaluation, as it is incompatible with current land use (residential neighborhood).
In Situ Containment	Capping	Clean Soil Cap	Capping is commonly used at contaminated sites because it is generally less expensive than active remediation technologies and can effectively manage the human and ecological risks associated with a remediation site. Caps can range from a one-layer system of vegetated soil to a complex, multi-layer system of soils, geosynthetics, and impervious surfaces. Capping does not lessen toxicity, mobility, or volume of hazardous wastes, but does mitigate migration and eliminates some exposure pathways.	No	This technology is not retained for further evaluation, as it is incompatible with current land use (residential neighborhood). The highest concentrations of contaminants are near the ground surface; installing a cap above the existing grade while maintaining use of existing structures and infrastructure is infeasible.
In Situ Treatment	Biological	Natural Attenuation	Consideration of this option usually requires modeling and evaluation of contaminant degradation rates and pathways, as well as predicting contaminant concentration at downgradient receptor points, especially when the plume is still expanding/migrating. The primary objective of site modeling is to demonstrate that natural processes of contaminant degradation will reduce contaminant concentrations below regulatory standards or risk-based levels before potential exposure pathways are completed. In addition, long-term monitoring must be conducted throughout the process to confirm that degradation is proceeding at rates consistent with meeting cleanup objectives.	No	Dioxins do not readily degrade in the environment; therefore, the natural attenuation option is not retained.
		Slurry Bioremediation	Addition of nutrients and other amendments to enhance bioremediation, the process in which microorganisms degrade organic contaminants, converting them to innocuous end products.	No	Dioxins do not readily biodegrade; therefore, this technology is not retained for further evaluation.
		Phytoremediation	Use of plants to remove, transfer, stabilize, and destroy contaminants in soil and sediments.	No	The effectiveness of phytoremediation of dioxins has not been demonstrated; this technology is not retained for further evaluation.
		Aerobic Biodegradation / Bioventing	Bioremediation is a process in which microorganisms degrade organic contaminants, converting them to innocuous end products. Nutrients, oxygen, or other amendments may be used to enhance bioremediation and contaminant desorption from subsurface materials. Aerobic bioremediation requires an oxygen source. Bioventing stimulates the natural in situ biodegradation of any aerobically degradable compounds in soil by providing oxygen to existing soil microorganisms. Oxygen is most commonly supplied through direct air injection into residual contamination in soil.	No	This technology is not retained for further evaluation because of limited effectiveness against dioxins as well as implementability issues.
		Anaerobic Biodegradation	Bioremediation conducted in the absence of oxygen.	No	This technology is not retained for further evaluation because of limited effectiveness (especially related to dioxins) as well as implementability issues.

General Response Action	Remedial Technology	Process Options	Description	Retained for Alternatives	Screening Comments
In Situ Treatment, cont.	Chemical	Chemical Oxidation	Application of chemical oxidants to contaminated soil to convert hazardous contaminants to nonhazardous or less toxic compounds that are more stable, less mobile, and/or inert. Chemical oxidation typically involves reduction/oxidation (redox) reactions. The oxidizing agents most commonly used are ozone, hydrogen peroxide (H2O2), hypochlorites, chlorine, and chlorine dioxide.	No	This technology is not retained for further evaluation because of limited effectiveness as well as low implementability. Oxidation would not be effective for reducing total dioxin concentrations. Implementing this cleanup action alternative component would pose many logistical issues.
	Physical—Extractive Processes	Soil Flushing	In situ flushing is defined as the injection or infiltration of an aqueous solution into a zone of contaminated soil/groundwater, followed by downgradient extraction of groundwater and elutriate (flushing solution mixed with the contaminants) and aboveground treatment and discharge or reinjection.	No	This technology is not retained because of limited effectiveness as well as implementability issues. The technology mobilizes contaminants from the soils and should be used only where flushed contaminants and flushing fluid can be contained and recaptured. The potential exists for washing the contaminant beyond the capture zone. Costs associated with treatment of the recaptured fluids are high.
		Vapor Extraction	Soil vapor extraction (SVE) is an in situ unsaturated (vadose) zone soil remediation technology in which a vacuum is applied to the soil to induce the controlled flow of air and remove volatile and some semivolatile contaminants from the soil. The gas leaving the soil may be treated to recover or destroy the contaminants, depending on local and state air discharge regulations.	No	This technology is not effective for the remediation of dioxins and is therefore not retained for further consideration.
		Thermal Extraction	Thermally enhanced SVE is a full-scale technology that uses electrical resistance/electromagnetic/fiber optic/radio frequency heating or hot-air/steam injection to increase the volatilization rate of semivolatiles and facilitate extraction.	No	This technology is not effective for the remediation of dioxins and is therefore not retained for further consideration.
	Enhancement	Fracturing	Fracturing is an enhancement technology designed to increase the efficiency of other in situ technologies in difficult soil conditions. The fracturing extends and enlarges existing fissures and introduces new fractures, primarily in the horizontal direction. After fracturing has been completed, the formation is subjected to vapor extraction, either by applying a vacuum to all wells or by extracting from selected wells, while other wells are capped or used for passive air inlet or forced-air injection.	No	The retained technology will not benefit from fracturing enhancement; therefore, fracturing is not retained for further consideration.
	Physical—Immobilization	Solidification / Stabilization	The addition of reagents that immobilize and/or bind contaminants to soil in a solid matrix or chemically stable form.	No	The in situ solidification/stabilization of shallow soils is incompatible with the current (residential) land use. This technology is not retained for further evaluation.
		Vitrification	Use of strong electrical current to heat soil to temperatures above 2400ºF to fuse it into a glassy solid.	No	This technology is not retained for further evaluation because of limited effectiveness and low implementability.
		Electrokinetic Separation	Application of a low-intensity, direct current through the soil between ceramic electrodes divided into a cathode array and an anode array mobilizing charged species. Two primary mechanisms transport contaminants through the soil toward one or the other electrode: electromigration and electro-osmosis.	No	This technology is effective only on polar contaminants and fine-grained soils, and is not retained for further evaluation because of limited effectiveness against dioxins and because of many implementability issues. Additionally, there have been few, if any, commercial applications of electrokinetic remediation in the United States.

General Response Action	Remedial Technology	Process Options	Description	Retained for Alternatives	Screening Comments
In Situ Treatment, cont.	Physical—Immobilization, cont.	Ground Freezing	The ground-freezing process converts in situ pore water to ice through the circulation of a chilled liquid via a system of small-diameter pipes placed in drilled holes. The ice fuses the soil or rock particles together, creating a frozen mass of improved compressive strength and impermeability. Brine is the typical cooling agent, although liquid nitrogen can be used in emergency situations or where maintenance of the freeze is required only for a few days.	No	This technology is not retained for further evaluation because of limited effectiveness and significant implementability issues.
Ex Situ Treatment	Containment	Excavation, Off-Site Disposal, and Soil Replacement	Contaminated material is removed and transported to permitted off-site treatment and/or disposal facilities. Some pretreatment of the contaminated media may be required in order to meet land disposal restrictions. Excavated material is replaced with clean imported material.	Yes	Easily implementable, cost effective, appropriate for current and future land use, retained for further evaluation.
	Biological	Biopiles, Composting, Land Farming, Slurry Phase	Biopile treatment is a full-scale technology in which excavated soils are mixed with soil amendments and placed on a treatment area that includes leachate collection systems and some form of aeration. It is used to reduce concentrations of petroleum constituents in excavated soils through the use of biodegradation. Moisture, heat, nutrients, oxygen, and pH can be controlled to enhance biodegradation.	No	This technology is not retained for further evaluation because it is not effective for the remediation of dioxins. It also poses logistical implementability issues.
	Chemical	Extraction	Chemical extraction does not destroy wastes but is a means of separating hazardous contaminants from soils, sludges, and sediments, thereby reducing the volume of the hazardous waste that must be treated. The technology uses an extracting chemical and differs from soil washing, which generally uses water or water with wash-improving additives. Commercial-scale units are in operation. They vary in regard to the chemical employed, type of equipment used, and mode of operation.	No	These technologies are not retained for further evaluation because the soil does not require treatment prior to disposal.
		Reduction / Oxidation	Redox reactions chemically convert hazardous contaminants to nonhazardous or less toxic compounds that are more stable, less mobile, and/or inert. Redox reactions involve the transfer of electrons from one compound to another. Specifically, one reactant is oxidized (loses electrons) and one is reduced (gains electrons). The oxidizing agents most commonly used for treatment of hazardous contaminants are ozone, hydrogen peroxide, hypochlorites, chlorine, and chlorine dioxide. Chemical redox is a short- to medium-term technology.	No	
		Soil Washing	Ex situ soil separation processes (often referred to as "soil washing") are based mostly on mineral processing techniques. Soil washing is a water-based process for scrubbing soils ex situ to remove contaminants. The process removes contaminants from soils in one of the following two ways: by dissolving or suspending them in the wash solution (which can be sustained by chemical manipulation of pH for a period of time); or by concentrating them into a smaller volume of soil through particle size separation, gravity separation, and attrition scrubbing.	No	

General Response Action	Remedial Technology	Process Options	Description	Retained for Alternatives	Screening Comments
Ex Situ Treatment, cont.	Chemical, cont.	Dehalogenation	Contaminated soil is screened, processed with a crusher and pug mill, and mixed with reagents. The mixture is heated in a reactor. The dehalogenation process is achieved by either the replacement of the halogen molecules or the decomposition and partial volatilization of the contaminants.	No	These technologies are not retained for further evaluation because the contamination levels in soil do not require treatment prior to disposal.
	Physical	Separation / Screening	The separation processes are used for removing contaminated concentrates from soils, to leave relatively uncontaminated fractions that can then be regarded as treated soil. Ex situ separation can be performed by many processes. Gravity separation and sieving/physical separation are two well-developed processes that have long been primary methods for treating municipal wastewaters. Magnetic separation, on the other hand, is a much newer separation process that is still being tested.	No	
		Solidification / Stabilization	Ex situ S/S contaminants are physically bound or enclosed within a stabilized mass (solidification), or chemical reactions are induced between the stabilizing agent and contaminants to reduce their mobility (stabilization). Ex situ S/S, however, typically requires disposal of the resultant materials.	No	
		Thermal Treatment	The process involves raising the temperature of the contaminated equipment or material to 260°C (500°F) for a specified period of time. The gas effluent from the material is treated in an afterburner system to destroy all volatilized contaminants. The method eliminates a waste that currently is stockpiled and requires disposal as a hazardous material. This method will permit reuse or disposal of scrap as nonhazardous material.	No	

APPENDIX D

APPLICABLE OR RELEVANT AND APPROPRIATE LAWS AND REGULATIONS

APPENDIX D

APPLICABLE OR RELEVANT AND APPROPRIATE LAWS AND REGULATIONS—OFF-PROPERTY PORTION

MAUL
FOSTER
ALONGI

1 INTRODUCTION

Washington Administrative Code (WAC) 173-340-710 states that cleanup actions conducted under the Model Toxics Control Act (MTCA) shall comply with applicable state and federal laws. This WAC section also addresses relevant and appropriate requirements, substantive (as opposed to procedural) requirements, and local government permits and approvals. This appendix summarizes the analysis completed to ensure conformance with WAC 173-340 710.

1.1 EXEMPTIONS FOR REMEDIAL ACTIONS

MTCA exempts persons conducting a remedial action at a facility, under a consent decree, order, or agreed order, from the procedural requirements of Chapters 70.94 (Air), 70.95 (Solid Waste), 70.105 (Hazardous Waste), 75.20 (Hydraulic Permit), 90.48 (Water Quality), and 90.58 (Shorelands) of the Revised Code of Washington (RCW), and the procedural requirements of any laws requiring or authorizing local government permits or approvals for the remedial action. This exemption does not apply to independent actions.

The Washington State Department of Ecology (Ecology) is required to ensure compliance with the substantive provisions of Chapters 70.94, 70.95, 70.105, 75.20, 90.48, and 90.58 RCW, and the substantive provisions for laws requiring or authorizing local government permits or approvals. Ecology makes the final decision regarding which substantive provisions are applicable. Under policy and procedure directive 130B, Ecology describes how compliance will be assured and these exemptions will be implemented.

The remedial action will be conducted in accordance with an amended order or consent decree. Therefore, an evaluation of the allowed exemptions to the laws, regulations, and rules will be conducted during the design phase. The remedial action will be developed to ensure conformance with the substantive provisions of these laws, regulations, and rules.

2 SUMMARY OF GENERALLY APPLICABLE OR RELEVANT AND APPROPRIATE FEDERAL LAWS AND REGULATIONS

Remediation at the off-property portion (OPP) of the Port site will be subject to the variety of federal laws and regulations that govern site cleanup. The applicable or relevant and appropriate requirements (ARARs) are discussed below.

2.1 Clean Water Act

The Federal Water Pollution Control Act (FWPCA) Amendments of 1972, commonly referred to as the Clean Water Act (CWA), set forth a number of provisions that require the development of regulations to protect the nation's waters. Section 402 of the CWA requires the development of comprehensive programs for preventing, reducing, or eliminating pollution in the nation's waterways. National Pollutant Discharge Elimination System (NPDES) requirements are specified in Section 402. This program has been delegated to the State of Washington (see Section 3.4).

The objective of the CWA (33 U.S. Code [USC] 1251-1376 and 40 Code of Federal Regulations [CFR] 129 and 131) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Sections 303 and 304 of the CWA require the U.S. Environmental Protection Agency (USEPA) to issue ambient surface water quality criteria for the protection of aquatic life and human health. The federal water quality criteria (FWQC), as specified in 40 CFR 131, are non-enforceable guidelines to be used by states to set water quality standards for surface water. FWQC, based on chronic and acute effects to aquatic life, have been developed for 120 priority toxic pollutants and 45 non-priority pollutants for marine waters and freshwater.

Effect on Design:

During construction, water will be directed through erosion- and sediment-control features to meet any water quality standards. There should be no releases of water to the surrounding waterways associated with the upland off-property work. Any water discharged to Carty Lake or Lake River will be required to meet the FWQC. The State of Washington has been delegated as the authority to implement the CWA and has rules and regulations corresponding to all of those stated in the CWA. Therefore, for the Port, any discharges to surface water will be managed under the state program.

2.2 Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) of 1918 makes it unlawful to kill or harass migratory birds by any means unless permitted by regulations. Furthermore, the MBTA requires that identified ecosystems of special importance to migratory birds be protected against pollution, detrimental alterations, and other environmental degradations.

Effect on Design:

Implementing the remedial action in conformance with MTCA will protect wildlife, including migratory birds. Consequently, no additional actions are needed to conform to the MBTA.

2.3 The Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) was initially passed by Congress in 1974 and then amended in 1986. The SDWA establishes maximum contaminant levels (MCLs) and maximum contaminant level goals (MCLGs) for the protection of the nation's public water systems. The USEPA has established MCLs in 40 CFR Part 141 as the maximum permissible concentrations of specific contaminants in water that is delivered to any user of a public water system. While non-enforceable, MCLGs represent the maximum level beyond which persons drinking the water may experience adverse effects.

Under the SDWA amendments, the USEPA is required, every three years, to develop a list of contaminants that must be regulated in the form of MCLs or MCLGs. Those regulations must be finalized within a year of its proposal. In addition, the USEPA identifies contaminants that are under consideration for listing as MCLs, as well as contaminants that are under consideration for modification of the MCL concentration.

The State of Washington has authorization from the USEPA to administer and enforce this act. Although the state has developed, and continues to develop state-specific MCLs and MCLGs, it incorporates the federal standards by reference.

Effect on Design:

The OPP remedial action will have no effect on groundwater or any other water source used as drinking water.

2.4 Natural Resource Damages

The Natural Resource Damage provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Oil Pollution Act of 1990, and the CWA allow natural-resource trustees to assess damages for losses arising from injury to public natural resources caused by the release of oil or hazardous substances. The 43 CFR 11.62 provides the definitions of what constitutes an injury to a natural resource, particularly the definitions of injury to surface-water resources, groundwater resources, air resources, geologic resources, and biological resources. The definition of injury either must be met, or will likely be met, for natural resource damages to be included for a given facility or property.

Once natural resource damages have been established by federal, state, or Native American Tribe trustees, the responsible party must take actions to restore the damaged resource. These actions can either take the form of cash payment to a trustee, or the responsible party can undertake its own restoration projects, or both.

Effect on Design:

In accordance with MTCA, the remedial design will establish means and methods to ensure that the remedial action minimizes short-term risks during implementation. Consequently, natural resource damages caused by remedial action implementation will be avoided.

2.5 National Pretreatment Standards for Discharges to a Publicly Owned Sewer System

In general, the discharge of wastewater to publicly owned treatment works is considered an off-site activity. Requirements of the National Pretreatment Program include general and specific discharge prohibitions (40 CFR 403).

Effect on Design:

There will be no discharge to a publicly owned sewer system as part of the remedial action; therefore, this requirement is not applicable.

2.6 Identification and Listing of Hazardous Waste and Standards for Generators

The Solid Waste Disposal Act (42 USC 6921 Subtitle C) incorporated under the federal Resource Conservation and Recovery Act (RCRA, 40 CFR § 260 through 266) contains requirements for "cradle to grave" management of materials that meet the RCRA definition of hazardous waste. These requirements may apply to waste generated during a remedial action.

RCRA defines hazardous waste as either waste specifically listed in 40 CFR § 261 Subpart D or waste exhibiting one of four hazardous characteristics: ignitability, corrosivity, reactivity, or toxicity, as determined by the toxicity characteristic leaching procedure (TCLP). Requirements to determine whether waste being generated is hazardous, whether by sampling and analysis or by process knowledge, are listed in 40 CFR § 262.11.

Effect on Design:

The source of the material cannot be determined; therefore, under the guidelines provided by the USEPA, the dioxin-contaminated soil is not designated as hazardous waste, and this requirement is not applicable.

2.7 Treatment, Storage, and Disposal Facility Standards

The Solid Waste Disposal Act (42 USC 6921 Subtitle C) incorporated under RCRA (40 CFR § 264) provides design standards for treatment, storage, and disposal (TSD) facilities. The TSD requirements for hazardous waste are normally associated with facilities applying for, or having received, a RCRA permit.

Effect on Design:

No treatment of the material is associated with the remedial action. Material will be disposed of off-site at a Subtitle D landfill facility with an existing permit. This requirement is not applicable.

2.8 Land-Disposal Restrictions

LDRs for RCRA wastes characterized as toxic (40 CFR § 268) require that the waste be treated to specified concentrations before placement in a land-based unit. LDRs would apply to wastes removed from the site that exceed treatment standards for waste codes or that fail a TCLP analysis.

Effect on Design:

No waste characterized as toxic under RCRA is known to be present on site; this requirement is not applicable.

2.9 U.S. Department of Transportation Hazardous Materials Regulations

The U.S. Department of Transportation has published regulations, including requirements regarding communications and emergency response, shipping, and packaging (40 CFR 171 through 180), that govern the transportation of hazardous materials to or from the site.

The provisions of 40 CFR § 263 establish minimum standards that apply to persons transporting hazardous waste by air or water.

Effect on Design:

The remedial action does not involve the off-site transportation of hazardous waste; this requirement is not applicable.

2.10 National Ambient Air Quality Standards Attainment Area

The USEPA has established national ambient air quality standards (NAAQS) for a variety of potentially airborne substances known as criteria pollutants. NAAQS are ARARs for any conditions at a site that may result in emissions to the air of any listed criteria pollutant. Criteria pollutants include carbon monoxide, nitrogen dioxide, ozone, lead, particulates smaller than 10 micrometers, and sulfur dioxide.

Effect on Design:

The selected remedial alternative involves soil handling and excavation. The air emissions generated by handling soil at the site are subject to applicable air-quality standards to control or prevent the emission of air contaminants. Based on the contaminants present at the site, the applicable criteria pollutant would be particulate matter (dust).

2.11 Occupational Safety and Health Administration

Federal Occupational Safety and Health Administration (OSHA) regulations pertaining to hazardous waste sites are addressed under 29 CFR 1910.120, the Hazardous Waste Operations and Emergency

Response Standard. This standard applies to cleanup and corrective actions, as well as to operations involving hazardous waste, that are conducted at a permitted TSD facility, unless the employer can demonstrate that the operations do not involve employee exposure or the reasonable possibility of employee exposure to safety or health hazards.

Effect on Design:

All work will be performed under a site health and safety plan in conformance with applicable federal and state OSHA regulations.

2.12 Cultural Resources

The federal Antiquities Act (1906) laid out penalties for the unauthorized excavation of archaeological sites, granted the president the authority to designate national monuments, and authorized the managers of federal lands to grant permits for examinations of archaeological resources. The law granted the government the authority not only to declare landmarks on federal lands but also to receive "relinquished" segments of private land. Permits for "examination, excavation, and gathering…of objects of an antiquity" are to be granted by the secretaries of the interior, agriculture, and army only to organizations conducting work to expand the knowledge of those objects and only so that they may be displayed in public museums 16 USC 431-433).

The 1966 National Historical Preservation Act (NHPA) states the importance of "historic heritage" to the nation, and spells out in general terms the federal government's intentions to protect and administer cultural resources. Section 101 directs the secretary of the interior to establish the National Register of Historic Places (NRHP); to set rules and guidelines relating to nominations; to appoint state historic preservation officers and establish state preservation programs; to assist tribes in historic preservation and in designating tribal historic preservation officers; and to make traditional cultural properties eligible for listing. Section 106 has had a large impact on, and is central to, resource management. Section 106 requires that federal agencies that have any indirect or direct jurisdiction over undertakings that involve federal funds or federal licensing take into account the effect the undertaking will have on a resource that is listed, or that is potentially eligible for listing, on the NRHP. Agencies are required to allow the Advisory Council on Historic Preservation (ACHP) time to comment on the proposed undertakings. 36 CFR provides regulations regarding parks, forests, and public property; 36 CFR 60.4 outlines criteria used to evaluate the eligibility of a property for listing on the NRHP. Section 110 of the law makes it the specific responsibility of federal agencies to implement historic preservation plans, list eligible properties, appoint preservation officers, and generally comply with the NHPA for properties under the agencies' management. In other sections the law generally mandates federal agencies to protect, list on the NRHP, manage, and identify properties, and to assist and consult with other agencies and private groups on resource management. In Title II it establishes the ACHP and empowers it to implement NHPA regulations.

The 1978 American Indian Religious Freedom Act made it the policy of the U.S. government and federal agencies to "…protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions…." This protection is centered on religious practice but encompasses and recognizes the importance of place and objects. The act requires federal agencies to consult with traditional religious leaders on potential impacts to rights and practices (42 USC 1996).

The 1979 Archaeological Resources Protection Act (ARPA) defines archaeological resources and stipulates that the act applies to resources more than 100 years old; furthermore, it strengthens the permit process for work on these resources on federal and Indian lands. Permits granted under this law for work that may disturb archaeological resources are subject to review by tribes "which may consider the site as having religious or cultural importance" 16 USC 470cc(c)). The law grants the secretary of the interior authority to develop regulations regarding the exchange and curation of excavated materials and encourages the coordination of efforts between federal agencies and private individuals with archaeological collections. 43 CFR 7.9 outlines permit requirements, including an agreement about the final disposition of collected artifacts. It also criminalizes the removal of resources without a permit, specifies criminal and civil penalties for doing so, and exempts the disclosure of the location of archaeological resources from the public record (16 USC 470aa-470mm). 32 CFR 229 provides the regulations, definitions, and standards for implementation of ARPA.

The 1990 Native American Graves Protection and Repatriation Act deals with the disposition of indigenous tribal cultural items recovered on tribal or federal lands. It defines and addresses human remains, funerary goods, sacred objects, and objects of cultural patrimony, which are referred to as cultural items, and specifies the return of those objects to lineal descendants of the individual or tribe on whose land the items were recovered. The act further outlines the process by which permits are granted (under the ARPA framework) for excavation of described cultural items.

36 CFR 79 (Curation of Federally Owned and Administered Archeological Collections) was codified in 1990 to "…establish definitions, standards, procedures and guidelines to be followed by Federal agencies to preserve collections of prehistoric and historic material remains, and associated records…" as stipulated in the Antiquities Act, the Reservoir Salvage Act, the NHPA, and ARPA (36 CFR 79.1). This complicated set of regulations lays out many guidelines on the care and management of existing and future collections of archaeological material.

State-funded capital construction projects, with no federal funding or permits, must comply with the Governor's Executive Order 05-05 (GEO 05-05). GEO 05-05 requires a similar cultural resources review process to section 106.

Effect on Design:

Systematic archaeological surveys will be conducted on properties to which access is granted to determine if archaeological resources are present. Where resources are identified, measures will be defined to address project impacts in coordination with the Washington Department of Archaeology and Historic Preservation and with appropriate tribes. For properties where access is not granted, the interim action will be conducted consistent with a cultural resources monitoring and inadvertent discovery plan to address any archaeological discoveries made during the proposed action.

3 SUMMARY OF GENERALLY APPLICABLE OR RELEVANT AND APPROPRIATE WASHINGTON STATE LAWS AND REGULATIONS

The following state laws, regulations, and local requirements were determined to be ARARs.

3.1 Model Toxics Control Act

In Washington State, MTCA governs the investigation and cleanup of contaminated sites (Chapter 70.105D RCW). A contaminant is defined by MTCA 173-340-200 as any hazardous substance that does not occur naturally or that occurs at concentrations greater than natural levels.

MTCA became effective in March 1989 and was enacted through a voter-initiative process. The MTCA cleanup regulation, cited under Chapter 173 340 WAC, was amended in February 2001. MTCA contains provisions controlling site cleanup activities, including site discovery, priority, listing, investigation, and cleanup; liability provisions; administrative options for remedial actions, payment of costs, and funding; public participation; cleanup standards; and other general provisions. The law regulates the cleanup of sites contaminated with CERCLA hazardous substances, all state and federal RCRA hazardous and dangerous wastes, and petroleum products.

Effect on Design:

All elements of the remedial design and remedial action will comply with MTCA standards.

3.2 Water Quality Standards for Surface Waters and Ground Waters of the State

In Washington, water quality standards for surface waters of the state are promulgated under Chapter 173-201A WAC. The purpose of this chapter is to establish water quality standards for surface waters of Washington State that are consistent with public health and related public enjoyment, and with the propagation and protection of fish, shellfish, and wildlife, pursuant to the provisions of Chapter 90.48 RCW. The criteria listed in Chapter 173-201A WAC for surface water quality provide protective numbers for both freshwater and marine aquatic life regarding both acute and chronic exposure to toxic substances.

Water quality standards for groundwater are also promulgated under Chapter 173-200 WAC. This chapter implements the FWPCA and Chapters 90.48 and 90.54 of the RCW, as well as the federal Water Resources Act of 1971. Chapter 173-200 WAC applies to all groundwaters of the state that occur in a saturated zone, stratum beneath the land surface, or below a surface-water body. The water quality standards listed in Chapter 173-200 WAC apply to cleanup actions conducted under MTCA that involve potable groundwater.

Effect on Design:

No water will be generated during construction. Stormwater will be directed through erosion and sediment control best management practices to meet the water quality standards. In addition, state water quality standards are considered screening criteria.

3.3 Washington Dangerous Waste Regulations

Washington regulations identify RCRA F-listed and K-listed waste as dangerous waste (WAC 173-303-9904). Designated dangerous waste may be treated, stored, or disposed of at a permitted TSD facility.

Effect on Design:

Material generated on site will not be considered dangerous waste; this requirement is not applicable.

3.4 National Pollutant Discharge Elimination System Stormwater Permit Program

Chapter 173-220 WAC establishes a state permit program, applicable to the discharge of pollutants and other wastes and materials to the surface waters of the state, operating under state law as part of the NPDES created by Section 402 of the FWPCA. Permits issued under this chapter are intended to satisfy the requirements for discharge permits issued under both Section 402(b) of the FWPCA and Chapter 90.48 RCW.

Effect on Design

NPDES construction stormwater permits are required for construction sites of one acre or larger. The selected remedial action alternative will have a construction footprint greater than one acre. As the NPDES program is a federal program administered by the state, the MTCA exemption for state and local permits does not apply. The project will obtain coverage under the state's NPDES construction stormwater general permit for the proposed work. As the project involves the disturbance of soil with known contamination, the notice of intent for coverage under the NPDES general permit will include a description of this contamination.

3.5 Shoreline Management Act

The state Shoreline Management Act (SMA) (Chapter 173-22 WAC) regulates any action within 200 feet of the ordinary high-water mark of a shoreline. Shorelines in towns and cities are regulated by shoreline master programs (Chapter 173-26 WAC) adopted by local municipalities.

Effect on Design:

The proposed locations for remedial actions are outside the shoreline's jurisdiction; this requirement is not applicable.

3.6 Air Quality Standards

Chapters 173-400, -460, and -470 WAC establish provisions for general regulation of air pollution sources, ambient air quality standards, and acceptable levels for particulate matter, and stipulate requirements for new sources of toxic air pollutant emissions. These regulations may be applicable to cleanup actions at the site; for example, to control particulate emissions generated during soil excavation activities, or emissions resulting from air stripping or other groundwater treatment technologies. These standards are typically administered and enforced by the local clean air agency, which in this case would be the Southwest Clean Air Agency. Chapter 173-401 operating permits may be required for fugitive emissions from new sources. Emission standards for volatile organic compounds are set in Chapter 173-490.

Effect on Design:

The remedial work includes soil handling. During soil-excavation activities, it may be necessary to implement engineering controls such as soil wetting to control particulate emissions. Air testing may be required to show that emissions meet the substantive requirements of applicable air quality permits and rules. If results illustrate that substantive requirements have not been met, the design will require modification.

3.7 Noise Regulations

Maximum environmental noise levels have been determined and are contained in Chapter 173-60 WAC. Approved procedures for measurement of environmental noise are contained in Chapter 173-58 WAC.

Effect on Design:

During design, expected noise levels will be estimated and compared to the limitations established in 173-60 WAC. The need to adjust the approach to meet these requirements will be determined. For example, the noise level regulations may limit the hours of operation for some parts of the remedial action. Construction equipment may be required to be outfitted with additional noise-minimizing equipment (larger or additional mufflers, etc.).

3.8 State Environmental Policy Act

The State of Washington administers and enforces a program equivalent to the federal National Environmental Policy Act. The State Environmental Policy Act (SEPA), contained in Chapter 43.21C RCW, provides the framework for agencies to consider the environmental consequences of a proposal before taking action. It also gives agencies the ability to condition or deny a proposal because of identified likely significant adverse impacts. The act is implemented through the SEPA Rules and Procedures, Chapters 197-11 and 173-802 WAC, respectively.

SEPA review is a comprehensive assessment of potential environmental, economic, and cultural impacts from a specific development project or a proposed policy, plan, or program. The SEPA review process requires the preparation of an environmental checklist, which may be achieved by review of the environmental impacts and proposal of mitigation measures. The completed checklist helps to identify potential environmental impacts associated with the proposed action. Following a threshold determination, the lead agency will issue either a Determination of Non-Significance that will allow the action or permitting process to continue, or a Determination of Significance that will require that an environmental impact statement (EIS) be prepared before agency action can be taken. Typically, one checklist or EIS is required for a project, although it may require modification or application of numerous permits by federal, state, or local agencies.

Effect on Design:

SEPA review will be conducted for the project design. The Port or Ecology can act as the lead agency for SEPA review. The Port will prepare a SEPA checklist to be reviewed during Ecology's evaluation of the project design.

3.9 Washington Industrial Safety and Health Administration

Washington Industrial Safety and Health Administration (WISHA) regulations pertaining to hazardous waste sites are addressed under WAC 296-843, Hazardous Waste Operations. This standard applies to cleanup and corrective actions at MTCA-regulated sites.

Effect on Design:

All work will be performed under a site health and safety plan in conformance with the applicable WISHA regulations.

4 LOCAL REQUIREMENTS

4.1 Shoreline Master Program

A cleanup action or "substantial development" conducted along any shoreline of statewide significance in the city of Ridgefield is regulated under the Shoreline Master Program (Chapter 18.820 of the Ridgefield Municipal Code [RMC]). A Substantial Development Permit (SDP) is required for such an action. In 2012, the City of Ridgefield adopted an updated Shoreline Master Program.

Effect on Design:

The proposed locations for remedial actions are outside the shoreline jurisdiction.

4.2 City of Ridgefield Critical Areas Ordinance

The City of Ridgefield Critical Areas Ordinance designates and regulates projects that may impact ecologically sensitive areas, including wetlands, fish and wildlife habitat conservation areas, or geophysical hazards such as geologically hazardous areas and frequently flooded areas (RMC 18.280.120).

Effect on Design:

The off-property remedial action area is part of a category 2 critical aquifer recharge area. The off-property remedial action area is also identified as having a low to moderate liquefaction susceptibility, as indicated on the Alternative Liquefaction Susceptibility Map of Clark County, Washington. Relative to these items, the remedial design will meet the substantive requirements of the critical areas ordinance.

4.3 Street Tree Program

Work adjacent to street trees is regulated under Section 12.12 of the RMC. The RMC requires a permit for excavation within the drip line of any street tree and for the removal of any street tree. As a condition to the granting of a street tree permit, the director may require the applicant to relocate or replace trees. If a tree is interfering with the use of any utility that has been granted a franchise by the city of Ridgefield, it is required that notice of removal and/or excavation within the dripline be given to the director, but a permit is not required.

Effect on Design:

Removal and work within the drip line of street trees will meet the substantive requirements of the street tree program. Street trees will be protected during the proposed work; excavation near street trees will be conducted under the oversight of a certified arborist.

4.4 Street/Right-of-Way Excavation Permit

Excavations within the city of Ridgefield rights-of-way are regulated under Section 12.15 of the RMC. An excavation permit is required for work that involves disturbing the surface of any street, alley, sidewalk, curb, drainage-way, or other structure within city right-of-way. Standards for work within the city rights-of-way are described in the City of Ridgefield Engineering Standards for Public Works Construction.

Effect on Design:

Work within city rights-of-way will be completed in accordance with the substantive requirements of the applicable sections of the City of Ridgefield Engineering Standards for Public Works Construction.

APPENDIX E
WASTE DESIGNATION

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
2108 Grand Boulevard ▪ Vancouver, Washington 98661-4622 ▪ (360) 690-7171

January 30, 2013

Mr. Brent Grening
Executive Director
Port of Ridgefield
Post Office Box 55
Ridgefield, WA 98642

Re: Approval of January 29, 2013, *Upland Off-Property Dioxin Waste Designation Former Pacific Wood Treating Site, Ridgefield Washington* Memorandum, prepared by Maul, Foster, Alongi, Inc.
Ecology Facility Site Identification #1019

Dear Mr. Grening:

This letter provides the Port of Ridgefield (Port) with the Washington State Department of Ecology's (Ecology) written approval of the above-referenced memorandum. Approval of project documentation by this agency is required by Agreed Order Number 01TCPSR-3119 executed by Ecology and the Port of Ridgefield for cleanup efforts at the former Pacific Wood Treating (PWT) Corporation facility and surrounding environs.

If you have any questions or care to discuss items in this letter, please contact me by telephone at (360) 690-4795 or by e-mail at cran461@ecy.wa.gov.

Sincerely,

Craig Rankine, RG, LHG
Site Manager/Hydrogeologist
Toxic Cleanup Program
Vancouver Field Office

lc/CR

cc: Laurie Olin, Port of Ridgefield, Ridgefield, WA
Steven Taylor and Alan Hughes Maul Foster & Alongi Inc., Vancouver, WA
Madi Novak, Maul Foster & Alongi Inc., Portland, OR
Cindy Donnerberg, CH2MHill, Portland, OR
James DeMay, Ecology Southwest Regional Office, Lacey, WA

Ecology Southwest Regional Office Records Center, Lacey, WA

MEMORANDUM

To:	Craig Rankine	Date:	December 20, 2012
From:	Madi Novak	Project:	9003.01.39
	Steve Taylor, PE		

RE: Upland Off-Property Dioxin Waste Designation
Former Pacific Wood Treating Site, Ridgefield, Washington
Agreed Order No. 01TCPSR-3119

On behalf of the Port of Ridgefield, (Port), Maul Foster & Alongi, Inc. (MFA) has prepared this memorandum to determine the waste designation for soils containing dibenzo-p-dioxins and furans (collectively referred to as dioxins) off-property of the Lake River Industrial Site (LRIS) in Ridgefield, Washington. The LRIS is the location of the former Pacific Wood Treating Corporation (PWT) facility where historical operations primarily involved pressure-treating wood products with oil-based treatment solutions containing creosote, pentachlorophenol (PCP), and water-based mixtures of copper, chromium, arsenic, and/or zinc.

Soils that are located off property of the LRIS in the adjoining residential neighborhood and McCuddy's Marina parking area (i.e., off-property area) contain dioxins. However, the source of the dioxins is not readily apparent. Sources of dioxins at the PWT facility may have included spent formulations from wood preserving processes, combustion of waste by PWT and a previous shingle mill, combustion of fuels at the facility, and by trucks and trains traveling adjacent to the facility and to the offsite properties.

The U.S. Environmental Protection Agency (USEPA) has prepared a document clarifying RCRA policy for remediation waste[1] which provides the following on page 5 of the document.

> *Where a facility owner/operator makes a good faith effort to determine if a material is a listed hazardous waste but cannot make such a determination because documentation regarding a source of contamination, contaminant, or waste is unavailable or inconclusive, EPA has stated that one may assume the source, contaminant or waste is not listed hazardous waste and, therefore, provided the material in question does not*

[1] USEPA, 1998. Management of Remediation Waste under RCRA. Office of Solid Waste and Emergency Response. Ref. EPA530-F-98-026. October 14.

> ***exhibit a characteristic of hazardous waste, RCRA requirements do not apply... This approach was confirmed in the final NCP[2] preamble. See, 53 FR 51444, December 21, 1988 for proposed NCP preamble discussion; 55 FR 8758, March 13, 1990 for final NCP preamble discussion.***

There are no historical records of a release off- property from PWT's operation that would result in the determination that the off-property soils are a listed hazardous waste, specifically the F032, F034 and F035 listings that are assigned to *wastewater, process residuals, preservative drippage, and spent formulations from wood preserving processes that used chlorophenolic formulations, creosote or arsenic based treating solutions respectively.* These waste codes have been applied to soils on the property because of known releases on the property.

The soil containing dioxins that is located offsite of the former PWT facility (i.e., LRIS) is not designated as hazardous waste under the guidelines provided by USEPA. The operation that generated the dioxin compounds cannot be determined because there are several potential sources (including the wood treating operations) that could have led to contamination of soils in the offsite areas. Given this information, the F032, F034 and F035 listed hazardous waste codes are not applicable to the soil that could be generated during any future remedial action in the off-property area.

The soil sample results have also been reviewed for possible designation as a characteristic hazardous waste or a Washington state-only dangerous waste Per WAC 173-303-100 Dangerous Waste Criteria. The concentration of dioxins, polycyclic aromatic hydrocarbons (PAHs) and halogenated organic compounds (HOCs) were reviewed in accordance with the WAC 173-303-100 requirements as follows:

> Toxic Dangerous Wastes - The equivalent concentration for the toxic constituents (metals, PAHs, HOCs, and dioxins) is below the 0.001 percent threshold in WAC 173-303-100(5), and the material does not designate as a state-only toxic waste.
>
> Persistent Dangerous Wastes - PAHs, HOCs, and dioxins are below the 0.01 percent threshold for characterizing a material as a persistent dangerous waste as described in WAC 173-303-100(6).

Based on the above review, the soil to be generated during the off-property remedial action would not designate as a Washington state-only dangerous waste.

[2] National Contingency Plan