CLEANUP ACTION PLAN

DuPont South Parcel, Tacoma Smelter Plume

Prepared for: CalPortland

Project No. 040001-015 • April 22, 2020 • Final

Aspect CONSULTING

earth + water

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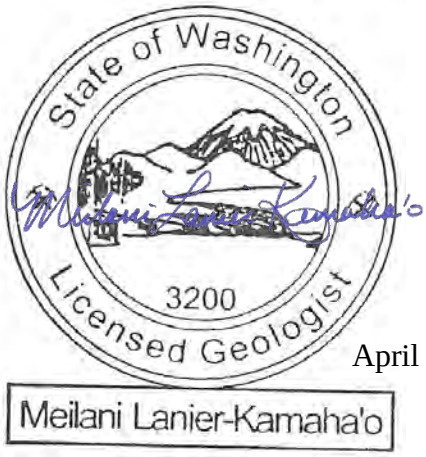

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Acronyms

Aspect	Aspect Consulting, LLC
bgs	below ground surface
BMP	Best Management Practices
CAP	Cleanup Action Plan
Ecology	Washington Department of Ecology
FS	Feasibility Study
HRA	Health Risk Assessment
mg/kg	milligrams/kilograms
MSHA	Mine Safety and Health Administration
MTCA	Model Toxics Control Act
RI	Remedial Investigation
SWPPP	Stormwater Pollution Prevention Plan
TSP	Tacoma Smelter Plume
VOC	volatile organic compound
WDNR	Washington Department of Natural Resources

1 Introduction

This Cleanup Action Plan (CAP) has been prepared to describe the remediation activities planned during the proposed expansion of CalPortland's Dupont Mine into an adjacent 178-acre area known as the South Parcel (Figure 1). The South Parcel is located to the south and east of the Existing Mine Area (Figure 2).

Surficial soils within the South Parcel and in undisturbed areas within the Existing Mine Area are potentially contaminated with arsenic and lead resulting from the Tacoma Smelter Plume and former operations of the DuPont Works Site. This CAP focuses on the remediation of these surficial soils within the areas of undisturbed soils planned for mining.

The Cleanup Unit (Figure 2) consists of undisturbed areas that will be mined as part of the proposed expansion, specifically:

1) Those areas of the South Parcel to be mined.
2) Previously undisturbed areas located between the mining limits in the Existing Mine Area and the South Parcel that will be mined.
3) A small wetland, known as the Kettle Wetland, that will be removed during mining.

The South Parcel also includes an Open Space Area along Sequalitchew Creek (approximately 3.3 acres) and a Mine Setback Area (approximately 7.8 acres); these areas are outside of the Cleanup Unit. These areas are depicted on Figure 2.

The Cleanup Unit is located downwind of the former Asarco copper smelter and refinery in Ruston, Washington. Airborne pollution emitted from the former smelter has resulted in a 1,000-square-mile, area-wide plume of arsenic- and lead-contaminated soil known as the Tacoma Smelter Plume (TSP). The Cleanup Unit is within the TSP.

The Cleanup Unit also includes portions of another Washington State Model Toxics Control Act (MTCA) cleanup site. The Former DuPont Works Site, which operated from 1909 through 1976 as an explosives and commercial munitions production facility, is partially located within the South Parcel. Figure 3 shows the location of Parcels 1 and 2 of the Former DuPont Works Site in relationship to the South Parcel and the Cleanup Unit. Investigation and cleanup of the Former DuPont Works Site has been completed, as discussed further in Section 2.3. The implemented cleanup remedy includes restrictive (environmental) covenants that place use restrictions on portions of the Former DuPont Works Site.

Remediation and protection activities in the Cleanup Unit will be conducted as an independent action in accordance with MTCA, the MTCA Cleanup Regulations (Chapter 173-340 Washington Administrative Code [WAC]), and the Final Interim Action Plan (Ecology, 2012) and TSP Model Remedies Guidance (Ecology, 2019) for the TSP issued

by the Washington State Department of Ecology (Ecology). The independent cleanup will be conducted with Ecology consultation.

The planned mine expansion will extract sand and gravel from within the South Parcel and also allow for mining deeper within the Existing Mine Area. Figure 4 depicts the proposed final grades after the mine expansion, including how the proposed mining protects the Open Space Area and the Mine Setback Area within the South Parcel. Remediation and protection activities under this CAP will be conducted in coordination with mining, in a manner similar to the remediation of TSP-contaminated soils that is currently being performed for the North Parcel under a CAP approved by Ecology (Aspect Consulting, 2013).

2 Site Description

2.1 Location

The Cleanup Unit is primarily located in the South Parcel but also includes portions of the Existing Mine Area. The Cleanup Unit is comprised of those areas of the South Parcel to be mined, as well as previously undisturbed areas located between the mining limits of the Existing Mine Area and the South Parcel that will be disturbed during expansion of the mine, including the Kettle Wetland (Figure 3).

The South Parcel and the Existing Mine Area are owned by Weyerhaeuser NR Company (Weyerhaeuser) but are leased and operated by Glacier Northwest, Inc. (dba CalPortland; hereinafter "CalPortland"). The South Parcel is comprised of seven tax parcels that total approximately 178 acres (Figure 3). The South Parcel includes approximately 3.3 acres of Open Space Area along Sequalitchew Creek that will remain undisturbed and approximately 7.8 acres that will be maintained in a vegetated condition as a Mine Setback (Figure 2). The remainder of the South Parcel is part of the Cleanup Unit. The Cleanup Unit also includes portions of seven tax parcels within the Existing Mine Area.

The size of the Cleanup Unit is approximately 193 acres, which includes 167 acres within the South Parcel and 26 acres within the Existing Mine, and consists of all or part of 14 tax parcels.

2.2 Environmental Setting

This section presents a summary of the environmental setting of the Cleanup Unit and South Parcel, including the topography, geology, hydrogeology, and surface water characteristics, and a description of the Kettle Wetland.

Topography. The current topography is generally flat, at elevations on the order of 210 to 220 feet above mean sea level, with two exceptions. A natural steep slope on the southwest side of the South Parcel dips southwest to Sequalitchew Creek, which is located approximately 100 feet lower in elevation than the South Parcel. There is a northeast-southwest trending linear topographic feature, which is likely a former railroad track (based on regional historical use), where intermittent surface water has reportedly been observed.

Geology. The geology of the Cleanup Unit and South Parcel consists primarily of Vashon-age recessional sand and gravel, known locally as the Steilacoom Gravel. Exploration drilling across the Cleanup Unit indicates the Steilacoom Gravel extends to depths between 40 and 70 feet below ground surface (bgs) (Aspect, 2017). This recessional glacial unit is underlain by older Vashon-age glacial Advance Outwash deposits, pre-Vashon nonglacial deposits identified as the Olympia beds, and pre-Vashon glacial and nonglacial deposits. The Olympia beds are present at approximately 100 feet beneath the Cleanup Unit. The Olympia beds are truncated where the recessional outwash formed a delta into a glacial lake. The truncation of the Olympia beds is located west of the Cleanup Unit (Figure 3).

The proposed mining and reclamation activities would occur within the Steilacoom Gravel and Vashon Outwash members. Overlying the sand and gravel unit is several inches of topsoil with low organic and fines content and, in forested areas, forest duff. Based on the distribution of contaminants, described in Sections 2.4 and 2.5, remediation activities will largely be limited to the topsoil/duff horizon and the topmost portion of the Steilacoom Gravel.

Hydrogeology. The Vashon Aquifer is the primary hydrogeologic unit beneath the Cleanup Unit. The aquifer is unconfined, and average water table depths range from 14 to 18 feet bgs on the east (upgradient) side of the South Parcel, and 20 to 30 feet bgs on the west (downgradient) side. Over a monitoring period between 2004 and 2016, water table fluctuations in the Cleanup Unit area ranged from 6 to 12 feet in response to seasonal and longer-term precipitation changes (Aspect, 2017). Groundwater flow is to the west toward the truncation of the Olympia beds. In the southern portion of the South Parcel, shallow groundwater may flow south-southwest and discharge as springs into the Sequalitchew Creek ravine. The aquifer is underlain by the Olympia beds aquitard, which separates the Vashon Aquifer from the deeper Sea Level Aquifer (Aspect, 2017). Proposed mining activities include a dewatering system to lower water levels of the Vashon Aquifer within the Cleanup Unit by up to 75 feet to facilitate mining. Proposed mining activities will not penetrate the Olympia beds, and no hydraulic connection with the Sea Level Aquifer is expected. The Vashon Aquifer is not used for water supply in the area of proposed mining.

Surface Water. Sequalitchew Creek is a small stream that flows in a steep ravine generally south and west of the Cleanup Unit. The southwest portion of the South Parcel extends into the Sequalitchew Creek ravine and Sequalitchew Creek traverses the southwest edge of the South Parcel in this area (Figure 2). The Sequalitchew Creek channel originates from Sequalitchew Lake, on Fort Lewis, east of DuPont-Steilacoom Road, flows through wetlands located to the southeast of the Cleanup Unit, and continues to the west, draining into the Nisqually Reach of the Puget Sound. Most of the time, Sequalitchew Creek is obstructed by beavers, preventing flow from the lake through the wetlands. During these periods, flow in the creek originates at springs within the Sequalitchew Creek ravine. The creek is located at the property boundary at the southwestern corner of the South Parcel (Open Space Area) for approximately 600 feet (Figure 2).

Wetland. The Kettle Wetland is an enclosed depressional wetland system that comprises 1.78-acres northwest of the South Parcel (Figure 2). The wetland was delineated by Anchor QEA, LLC (formerly Anchor Environmental, LLC; Anchor), and detailed findings were presented in a wetland delineation report dated October 19, 2007. Anchor prepared an update to the wetland delineation report in 2018 (Anchor, 2018); both documents are included in Appendix C. The Kettle Wetland is a Category III wetland under Ecology's 2014 wetland rating method and a Class II wetland under the 2018 City of DuPont Municipal Code Critical Areas Regulations (Anchor, 2018).

The Kettle Wetland is hydrologically connected to the Vashon Aquifer (CH2M Hill, 2003), and water levels range from winter highs of 4 to 6 feet to summer levels of 1 to 2 feet. Anchor described the wetland as "dominated by emergent vegetation with a scrub-

shrub boundary," with soils described as black peat, 16 to 20 inches thick, above a layer of lower permeability silty (Anchor, 2007).

Although the Kettle Wetland is located to the northwest of the South Parcel, it will be removed to facilitate the mine expansion into the South Parcel and deeper within the existing mine. If practicable and feasible, wetland soils will be kept intact and may be relocated to a mitigation wetland as a best practice for re-establishment. For this reason, characterization of the wetland sediments has been conducted in accordance with the Model Remedies Guidance (Ecology, 2019). The results are presented in Section 2.4.3 of this CAP.

2.3 Land Use

The Cleanup Unit is located within the City of DuPont's designated Mineral Resource Overlay area, in which mining is a permitted use. The underlying zoning designation of Cleanup Unit is Manufacturing and Research in the south and Residential 4 and Residential Reserve in the north. The southwest corner of the South Parcel is within the Open Space zoning district (Figure 5).

Land uses surrounding the Cleanup Unit include: to the north and west, CalPortland's existing mining operation and processing facility; to the southwest and south, Sequalitchew Creek, a golf course, DuPont City Hall and the Dupont City Police Department; to the southeast, a small residential development; and, to the east, industrial, manufacturing and research, and commercial uses (Pierce County Assessor, and City of DuPont, websites, accessed February 2018).

A public access easement agreement, established in August 2011, allows for public access along 20-foot-wide shoreline access trail, located on the north sideslope of the Sequalitchew Creek ravine (City of Dupont, 2016; First American Title, No. 25, Document: 201108160369). This trail transects the western edge of the South Parcel for approximately 600 feet, where it is located entirely within the Open Space Area (Figure 5). There is no other public access to the South Parcel or Cleanup Unit.

As discussed in Section 2.4, the Former DuPont Works Site area north of Sequalitchew Creek is under a restrictive covenant that limits development to industrial use.

2.4 Regulatory and Remedial History

A portion of the Cleanup Unit is located within the boundary of the Former DuPont Works Site, a historical explosives and commercial munitions facility that operated from 1909 through 1976. Investigation and remediation activities have occurred across the approximately 841-acre Former DuPont Works Site to address impacts to soil and groundwater associated with these operations. This section provides a brief summary of the historical regulatory and remediation actions taken for areas of the Former DuPont Works Site that are located within the Cleanup Unit. Copies of pertinent regulatory documents are included in Appendix A.

From 1985 through 1989, initial investigations were conducted to identify and characterize environmental impacts at the Former DuPont Works Site. Based on the results of this early work, the Former DuPont Works Site was divided into two

geographic areas: 636 acres located south of Sequalitchew Creek plus a small area located north of the Creek, collectively identified as 'Parcel 1,' and the Black Powder Area, encompassing 205 acres north of Parcel 1 and Sequalitchew Creek, identified as 'Parcel 2' (Figures 3 and 6). The South Parcel and Cleanup Unit overlap with portions of both Parcel 1 and Parcel 2 of the Former DuPont Works Site, as shown on Figure 3.

In 1991, Weyerhaeuser and DuPont Company (DuPont) entered into Consent Decree 91-2-01703-1 with Ecology (Ecology, 1991) to complete a Remedial Investigation (RI), Health Risk Assessment (HRA), and Feasibility Study (FS) for the Former DuPont Works Site. Work completed under that Consent Decree included an interim source removal action on Parcel 2 to remove lead-contaminated surface soils, and numerous interim source removal actions throughout Parcel 1.

As a component of the RI, soil samples were collected from undisturbed vegetated locations outside of the Former DuPont Works Site to document area background soil quality in accordance with MTCA. Based on data from 20 samples, the 90th percentile soil arsenic concentration was calculated as 32 milligrams per kilogram (mg/kg). Ecology approved this as the area background soil arsenic concentration in accordance with MTCA, and thus applied it in the CAP as the soil cleanup for defined open space areas within the Former DuPont Works Site[1]. The RI includes no discussion about the TSP as the source of arsenic in area-wide surface soils, but the area background concentration being well above a natural background concentration (7 mg/kg) is consistent with the TSP. Based on the outcome of the HRA, the 2003 Final Cleanup Action Plan for the Former DuPont Works Site established the open space soil cleanup level for lead as 118 mg/kg, and the industrial land use soil cleanup levels for arsenic and lead as 90 mg/kg and 1,000 mg/kg, respectively (West Shore and Pioneer, 2003).

In addition to investigation of specific source and operational areas, as described in the following sections, the RI for the Former DuPont Works Site included the collection and analysis of more than 500 soil samples to evaluate the extent of arsenic and lead in surface soil (0- to 6-inch depth) and shallow subsurface soil (up to 2 feet). Historical results and sampling map are included in Appendix C. The results of this sampling indicate that the elevated lead concentrations occur around production areas in the north-central portion of Parcel 2 and are attributable to operations, as discussed further in Section 2.4.1. Arsenic concentrations showed no apparent relationship to source or operational areas and were largely restricted to the upper 6 inches of soil (Ecology, 2003). The use of herbicides for vegetation control was a suggested source of arsenic to surface soil but the distribution of elevated arsenic shows poor correlation with areas where vegetation control occurred. There is no discussion about the TSP as the source of arsenic to surface soil in the RI.

Ecology conducts periodic review of both Parcels 1 and 2 every five years to ensure continued protectiveness of the completed cleanup action and compliance with the restrictive covenants. In its 2016 periodic review (Ecology, 2016), Ecology determined that, with the environmental covenant in place, *"…remedial actions conducted at the Site continue to be protective of human health and the environment. The requirements of the*

[1] There is no residential land uses within the Former DuPont Works Site, therefore unrestricted soil cleanup levels for residential land use were not established in the CAP.

environmental covenant are being satisfactorily followed and no additional remedial actions are required at this time."

Remediation of contamination associated with the historical operations at the Former DuPont Works Site has been completed to meet established cleanup levels which, for the area north of Sequalitchew Creek, are for industrial use. Restrictive covenants are in place for the area north of Sequalitchew Creek, these covenants limit future development to industrial use and restrict public access to the land.

2.4.1 Parcel 2 Cleanup Activities (1993-1997)

Most of the overlap between the Cleanup Unit and the Former DuPont Works Site falls within Parcel 2 (Figure 3). For purposes of the RI, Parcel 2 was segregated into two study areas (Hart Crowser, 1994[2]): (1) the Black Powder Production Line, which traces the path of a former narrow-gage railway that connected the former Black Powder production facilities[3]; and (2) the 40-Reference Area, which comprised all of Parcel 2 other than the Black Powder Production Line. The investigation completed in the 40-Reference Area was limited to the shallow subsurface soil characterization for arsenic and lead, described above.

The 'Black Powder' that was manufactured consisted of sulfur, potassium or sodium nitrate, and charcoal (Hart Crowser, 1994). These inert materials went through a series of stations along the production line and were pulverized, milled, wetted, and crushed until 'rough grains' were formed and packaged based on grain size (Hart Crowser, 1994). The contaminants and media of concern for the Parcel 2 cleanup consisted of lead and arsenic in surface soil, which are the same as those for the TSP, attributed to the heavy equipment and machinery used in the production of the Black Powder (and use of herbicides for vegetation control, as described above). Interim source removal was completed in the summer of 1993 to remove surface soil with concentrations of lead exceeding 1,000 mg/kg at the Black Powder Production Line foundations[4] (Figure 6).

Following completion of the interim source removal, concentrations of arsenic, lead, and other contaminants met the Site-specific soil cleanup levels for industrial land use (Hart Crowser, 1994; Appendix C). The results of the RI also identified fill material consisting of demolition debris (cement, lumber, sheet metal, steel pipe fragments and wire) to depths of 1 to 6 feet bgs (Hart Crowser, 1994). Fill material may remain in shallow soil in discrete areas of Parcel 2.

Based on the results of the interim source removal, Ecology approved a CAP for Parcel 2 that required no further actions or monitoring if the property use was maintained as industrial. In 1997, Weyerhaeuser executed and recorded a restrictive covenant to

[2] Hart Crowser (1994) is the Draft RI which includes discussion of Parcel 2 data and conditions. Because Parcel 2 was removed from the Consent Decree in 1997, the Final RI (URS and Pioneer, 2003) includes no discussion of Parcel 2 data, therefore Parcel 2 data are derived from Hart Crowser (1994).

[3] Includes foundations of nine former production-related buildings and associated former storage buildings.

[4] Sources include grinding and wear of metal alloys in heavy equipment and machinery and/or lead-based paint, associated with burning of buildings during decommissioning of the facility.

establish institutional controls in the form of a deed restriction to restrict future property uses to industrial (Weyerhaeuser, 1997). The 1997 covenant also requires that the portion of Parcel 1 north of Sequalitchew Creek be maintained in industrial use. In 1997, Parcel 2 was deleted from the Consent Decree, which stated that "no further cleanup action is required on Parcel 2" (Weyerhaeuser, 1997).

2.4.2 Cleanup Activities in Parcel 1 Industrial Remediation Unit (1999-2006)

Parcel 1 of the Former DuPont Works Site is located mostly to the south of the Cleanup Unit (Figure 3). The CAP for Parcel 1 identified 22 large remediation units and more than 100 smaller remediation units within Parcel 1 (West Shore and Pioneer, 2003). One of the large remediation units, totaling 35.7 acres located immediately north of Sequalitchew Creek, is identified as the Industrial Remediation Unit. Approximately 16 acres of the Industrial Remediation Unit is within the boundaries of the Cleanup Unit (Figure 6). The portion of the Industrial Remediation Unit that is outside of the Cleanup Unit includes the former Burn Area. Most of the remediation activities within the Industrial Remediation Unit were associated with the former Burn Area.

In 2000 and 2001, interim source removal excavations were completed to remove soil that contained concentrations of explosives[5] and/or arsenic and lead above Site-specific industrial soil cleanup levels within the Industrial Remediation Unit. Only small areas of the excavations are located within the boundaries of the Cleanup Unit, with the majority being south of it (Figure 6). As a result of the excavation activities, all soil with concentrations of explosives and/or metals above the Site-specific industrial cleanup levels was removed from the Industrial Remediation Unit (Pacific Environmental and Redevelopment Corporation [PERC] and Pioneer, 2007).

In 2003, final reports documenting the RI, FS, and Risk Assessment were submitted to Ecology in fulfillment of the 1991 Consent Decree. The Final CAP for Parcel 1 was completed in July 2003 (West Shore and Pioneer, 2003). Ecology approved the CAP and a new Consent Decree (03-2-10484-7) for the remedial action was executed between Ecology and Weyerhaeuser and DuPont on August 15, 2003 (Ecology, 2003). A 2007 Closure Report provided the complete documentation of interim and final cleanup activities completed on Parcel 1 in fulfillment of the 2003 Consent Decree (PERC and Pioneer, 2007). Ecology issued a certification of completion of the active cleanup elements for the Former DuPont Works Site on April 26, 2007 (Ecology, 2007).

2.4.3 Post-Cleanup Soil Quality

The concentrations of arsenic and lead in existing soils on the Cleanup Unit are within the range of concentrations identified by Ecology for the TSP Site. According to Ecology (2019) the range of TSP concentrations anticipated to be present in surface soil within the Cleanup Unit is 40 to 100 mg/kg for arsenic and 250 to 500 mg/kg for lead. Table 1 presents the average arsenic and lead concentrations in existing surface soils on the Cleanup Unit as compared to the range of concentrations associated with the TSP Former DuPont Works Site.

[5] 2,4,6-trinitrotoluene (TNT), 2,4- and 2,6-dinitorotoluene (DNT), and nitrobenzene.

Table 1. Comparison of Average Metals Concentrations Remaining in Cleanup Unit Surface Soils with the Tacoma Smelter Plume Estimates

Location	Arsenic (mg/kg)	Lead (mg/kg)
Former DuPont Works Site Parcel 2 (Hart Crowser, 1994)		
Black Powder Production Line	19	132
40-Reference Area	43	191
Former DuPont Works Site Parcel 1: Industrial Remediation Unit Cleanup Confirmation Samples (PERC and Pioneer, 2007)		
0-1.5 feet below surface	38.1	120.7
1.5-3 feet below surface	10	98.5
3-6 feet below surface	3.7	32.3
Tacoma Smelter Plume (Ecology, 2019)	40-100	250-500

Average arsenic and lead concentrations are toward the lower end of the range associated with the TSP, as shown in Table 1. With respect to the TSP Site, Ecology defines 'elevated' as average arsenic concentrations above 20 mg/kg or average lead concentrations above 250 mg/kg. With regards to the TSP, the 'elevated' designation is analogous to exceeding the MTCA Method A cleanup levels for unrestricted use and cleanup is required by Ecology. Average concentrations of arsenic in surface soil (upper 6 inches) in the areas outside of the Black Powder Production Line area (the 40-Reference Area) of Parcel 2 and in the upper 18 inches of soil across the Parcel 1 Industrial Remediation Unit are considered 'elevated.' Average lead concentrations in surface soils across the Cleanup Unit are not considered 'elevated' (Table 1).

2.5 Wetland Sediment Sampling

Anchor performed sediment sampling in the Kettle Wetland on December 5, 2019, in accordance with the 2019 TSP Model Remedies Guidance (Ecology, 2019). Six sample stations were selected for the 1.78-acre wetland based on the guidance for the minimum number of sediment sample stations determined by wetland area. Per the TSP Model Remedies Guidance wetland sediment sampling protocol, sample stations were randomly determined using a map; some locations were adjusted at the time of sampling based on safety and field conditions. Locations were anticipated to be underwater, however at the time of sampling one location was dry. The sampling locations are presented on Figure 2, and analytical results and field methods are included in the attached Table 2.

At each sampling location, sediment samples were collected from two intervals: the first interval was from the sediment surface to 4 inches bgs and the second was from 4 inches to between 6.5 and 8 inches bgs. Sediment recovery to 8 inches was poor at most locations due to field conditions, and multiple attempts were made at each location. No soil below 8 inches bgs was included in the samples in accordance with the guidance. All sediment samples were collected using a hand corer sampler with a 2-inch polycarbonate

liner. Samples were placed in laboratory provided containers and stored on ice until being delivered to the laboratory.

In total, 12 sediment samples were collected and submitted to Analytical Resources Incorporated laboratory for analysis of arsenic and lead by EPA Method 6020A. The laboratory analytical report is provided in Appendix D. The average arsenic and lead concentrations for each sediment sampling depth were calculated and compared to the concentrations determined 'elevated' by Ecology for the protection of benthic invertebrates in freshwater sediment, which are greater than 14 parts per million (ppm) for arsenic and 360 ppm for lead (Ecology, 2019). The average arsenic and lead concentrations calculated for the two sample depth intervals, as well as all individual sample concentrations, are below Ecology's 'elevated' criteria for freshwater wetland sediments (Table 2). Based on these results, the wetland sediments do not require remediation under MTCA.

2.6 TSP-Related Metals

Surficial soils at the Cleanup Unit that have been undisturbed since the mid-1980s may contain arsenic in concentrations ranging between 40 and 100 mg/kg (Figure 1). This range was estimated by Ecology (2012) based on field sampling over a broad area of the TSP Site and use of a statistical model to interpolate between results. None of the Ecology sample locations were located on the Cleanup Unit or existing mine to the north and only a few sample locations were in the general vicinity of DuPont. The concentrations shown on Figure 1 represent the 90^{th} percentile estimate for arsenic concentrations in an area, meaning that 90 percent of actual arsenic concentrations are expected to be lower than the upper end of the range shown. Ecology's statistical model also indicates that undisturbed soils in the Cleanup Unit area may contain lead concentrations ranging between 250 and 500 mg/kg (Ecology, 2012).

Ecology's model indicates that the concentration of TSP-related metals decreases as the distance from the former smelter increases (Ecology, 2012). Ecology has also determined that elevated concentrations of metals in undisturbed areas within the TSP are generally confined to the top six inches of soil (Ecology, 2012). Additionally, forest duff, consisting of moderately decomposed leaves, needles, and other plant material that has gathered on the ground surface, can have elevated concentrations of arsenic and lead (Ecology, 2012).

Documented concentrations of arsenic and lead in surface soils on the Cleanup Unit are within the ranges anticipated by Ecology for the area, attributable to the TSP.

3 Regulatory Framework for Cleanup

3.1 Final Interim Action Plan

In 2012, Ecology issued a Final Interim Action Plan for the TSP, which defines cleanup standards, evaluates cleanup alternatives, and approves model remedies for remediation of properties within the TSP (Ecology, 2012). The cleanup action described in this CAP will be conducted in accordance with the TSP Model Remedies Guidance (Ecology, 2019), which is an appendix to the Final Interim Action Plan.

3.2 Constituents of Concern

Ecology identified arsenic and lead as indicator hazardous substances for the TSP (Ecology, 2012). Historical operations within the Cleanup Unit have contributed to arsenic and lead concentrations in soil, but the maximum concentrations are within the range of concentrations mapped for the TSP. Other constituents associated with historical operations within the Cleanup Unit were previously remediated by others, as discussed in Section 2.4. Accordingly, the only constituents of concern (COCs) for the Cleanup Unit are arsenic and lead.

3.3 Cleanup Standards

The cleanup standards for a remedial action include both a numeric cleanup level and the point of compliance, or location, where that cleanup level must be met in the affected media. The cleanup levels for the remedial action at the Cleanup Unit are those deemed appropriate by Ecology in the Final Interim Action Plan for the TSP, which consist of the following MTCA Method A soil cleanup levels for unrestricted land use:

- Arsenic = 20 mg/kg
- Lead = 250 mg/kg

The soil cleanup levels established for the Cleanup Unit are more stringent than the industrial use cleanup levels that were used to govern cleanup of the Former DuPont Works Site. The point of compliance for soil at the Cleanup Unit is the maximum depth of contamination, which is typically between 6 inches and 24 inches bgs.

3.4 Remedial Action Objectives

The remedial action objective is to protect human health and the environment from the potential risk associated with exposure to soil containing concentrations of arsenic and lead above the applicable cleanup levels.

3.5 Cleanup Alternatives

The Final Interim Action Plan (Ecology, 2012) identified four model remedies as appropriate for use on properties located within the TSP:

(1) Excavation and removal

(2) Mixing

(3) Capping in place

(4) Consolidation and capping.

The model remedies are described in an appendix to the Final Interim Action Plan, entitled "Tacoma Smelter Plume Model Remedies Guidance" (Ecology, 2019).

Because Ecology considered large-scale mixing impractical for the typical TSP remediation site, it limited use of the model mixing remedy to soils with average arsenic concentrations of less than 40 mg/kg or average lead concentrations of less than 500 mg/kg.

3.6 Selected Alternative

Mixing was selected as the most feasible remedy for the Cleanup Unit because of the planned mining activities (which by necessity include significant removal and handling of topsoil) and the Washington State Department of Natural Resources' (WDNR's) requirements for topsoil preservation.

CalPortland's ability to mix soils greatly exceeds that anticipated by the model remedy. The bulldozers, loaders, and dump trucks used for mining activities provide the ability to mix and amend large amounts of soil. In addition, clean soil amendments, particularly silts and clays from washing aggregate are readily available at the mining operation. As a result, the selected mixing remedy departs from the 2019 TSP Model Remedies Guidance by allowing application in areas where arsenic concentrations are predicted to exceed 40 mg/kg. Effectiveness of the mixing will be confirmed through sampling.

The components of the proposed cleanup action are presented in detail in Section 4.

4 Cleanup Action Elements

This section presents the details of the cleanup action. The cleanup action will consist of active remedial action in the Cleanup Unit.

4.1 Soil Remedial Action

The elements of the soil remedial action include clearing trees and vegetation, topsoil removal and mixing, stockpile placement and sampling, and reclamation.

4.1.1 Clearing

Clearing will occur in two parts. The first phase will consist of removing all trees from the Cleanup Unit in one event. Trees will be cleared by cutting down to near the ground surface.

The second phase of clearing will consist of the removal of stumps and vegetation using heavy equipment. Clearing will be conducted in segments, prior to topsoil removal, as mining activities progress across the Cleanup Unit. Stumps and vegetation will be removed and dragged into a pile. Once a pile of stumps and vegetation has accumulated, a portable grinder will be used to grind up the pile to create woodchips. The woodchips will be used to amend topsoil for use in reclamation. We understand that the soils are primarily comprised of sand and gravel, most of the soil from the stumps and root wads will fall to the ground surface. This process removes most of any soil adhered to the root mass. The chance of getting an appreciable amount of contaminated soil into the grinder and carried into woodchips is very low.

4.1.2 Topsoil Removal and Mixing

An estimated average thickness of 20 inches of topsoil, including forest duff, leaves, sticks, needles and other tree and plant debris on the ground surface, covers the mineral soil across the Cleanup Unit. This surficial material will be stripped in segments as mining activities progress across the Cleanup Unit. The segments typically range in size from 8 to 20 acres at any one time, depending on market conditions and the location within the mine area and Cleanup Unit. The topsoil will be stored in stockpiles for testing and reuse in reclamation. At an average thickness of 20 inches, the estimated volume of topsoil to be generated and handled is roughly 2,700 cubic yards per acre. The excavation and stockpiling processes will mix the topsoil consistent with the intent of Ecology's TSP Model Remedies Guidance (Ecology, 2019) and the Sampling and Analysis Plan.

4.1.3 Gravel Extraction

While not part of the remedial action, the extraction of aggregate from within the Cleanup Unit is a sequential part of the process needed to accomplish the remediation, and is, therefore, summarized in this section.

Following topsoil removal, mining will be completed using a bulldozer to push excavated material from the top of the mine face to two front-end loaders working on the mine floor. The front-end loaders will scoop up the sand and gravel and dump it into portable hoppers feeding a conveyor. The conveyor will move aggregate from the mine to the

existing processing area where water is used to wash the raw material to remove silt and clay. The residual sand and gravel is screened and sorted by size for use.

Contours of the proposed final ground surface at the conclusion of mining are shown in Figure 4. Mining will start in the northern portion of the Cleanup Unit, near the Kettle Wetland and Existing Processing Area, then proceed south along the eastern boundary of the Cleanup Unit. Each area will be mined completely, extracting sand and gravel from the current ground surface down to near the top of the Olympia Beds. Mine slopes will be cut to grade as mining progresses. Several large benches will be left in the southwest corner of the mine. The benches step up in elevation from the mine floor at the top of the Olympia Beds to the existing ground surface of approximately 200 to 210 feet in surrounding areas outside the mine.

The extraction rate is dependent on market demand for the material and may vary substantially from year to year. However, for planning purposes, the extraction rate is estimated to be 2.8 million cubic yards per year, up to an estimated total of 25 million cubic yards of aggregate extracted from the Cleanup Unit during the life of the mine.

4.1.4 Stockpile Storage

The topsoil stockpiles will be staged near the active mining area to reduce the handling and transportation of the soil. The size of the stockpiles will depend on the area being actively mined (i.e., the volume of soil generated) and the adjacent area that is available for stockpile storage. It is anticipated that multiple stockpiles will be generated during each phase of mining activity.

Based on the proposed mine expansion plans (Figure 4) the total volume of topsoil estimated to be generated in the Cleanup Unit is approximately 500,000 cubic yards. Of that, CalPortland estimates that 10,000 to 30,000 cubic yards of topsoil may be stockpiled at any particular time.

Typically, topsoil is stored in multiple smaller stockpiles located throughout the mine near the areas where it will be placed for reclamation. Stockpiles are typically long and narrow (e.g., wind rows) to facilitate spreading the topsoil down a finished slope. Sometimes stockpiled topsoil will be transported with dump trucks to the slope slated for reclamation.

The duration of stockpile storage is dependent on the schedule for progression of the mining activities. One goal of reclamation is to minimize the length of time that topsoil is stockpiled. However, occasionally topsoil must be stockpiled for longer periods. Erosion control Best Management Practices for stockpiles are described in Section 4.3.

4.1.5 Stockpile Compliance Sampling

Topsoil in the stockpiles will be sampled for chemical analysis to ensure that they are suitable for reuse in reclamation on mined slopes within the Cleanup Unit. The sampling will occur within one month of the soil stockpile being generated and prior to stabilization for long-term storage, if applicable. The stockpile sampling will follow the procedures and frequency described in the Sampling and Analysis Plan in Appendix B, which was modeled after the approved CAP for the North Parcel (Aspect, 2013), and based on the TSP Model Remedies Guidance (Ecology, 2019).

Each stockpile will be divided into segments based on the total calculated soil volume of the stockpile and the required number of composite samples. The chemical analytical results will be used to characterize each stockpile segment, which will determine whether the soil within that segment is suitable for reuse or requires additional remediation. The topsoil in each stockpile segment will be reused for reclamation on the Cleanup Unit if the chemical analytical results from that stockpile segment indicate compliance with applicable cleanup levels.

If the chemical analytical results do not indicate compliance with applicable cleanup levels, additional mixing and sampling will be performed as described in Section 4.1.6 and 4.1.7.

4.1.6 Reclamation and Topsoil Reuse

Reclamation of the mined area will be performed under a Reclamation Permit issued by WDNR under the Surface Mining Act (Chapter 78.44 RCW). This section summarizes the mine reclamation approach.

The reclamation plan for mining within the South Parcel and Cleanup Unit will include returning the mined slopes to forest and leaving a relatively flat mine floor for future development. Reclamation will occur as each mining segment is completed, creating a contemporaneous approach to reclaiming the site. As with the existing mine, segmental mining and reclamation is planned, where feasible, for the entire mine area.

Groundwater will seep from toe of the mined slope within the Cleanup Unit. Seep wetlands will be developed as a component of reclamation at locations where seepage occurs. The groundwater flow will be routed to the floor of the existing mine where a larger mitigation wetland will be created.

All excavated slopes at the perimeter of the Cleanup Unit, from existing grade to the total depth of the excavation, will be reclaimed and revegetated at slopes no greater than 3H:1V (horizontal:vertical) and sinuously join with the existing mined area to the north and west. After mining is complete in a segment, topsoil previously stripped and stored in advance of mining will be replaced to an approximate depth of three feet on the mined slopes for reforestation.

Topsoil reused for reclamation will consist primarily of excavated and mixed surface soils that meet the chemical criteria for reuse (Section 3.3), supplemented with woodchips from onsite stumps and vegetation (Section 4.1.1), stormwater sediments, and filter press fines to add organic material and moisture holding capacity. Fine-grained stormwater sediments are comprised primarily of rock dust and silt that has been washed from the aggregate product and tracked around by equipment working on the site and collected from the sediment pond in the water recycling facility and stormwater catch basins in the processing and transport areas of the facility. Filter press fines are those silt and clay sediments removed from the aggregate during the gravel extraction process (Section 4.1.3). It is unlikely for the stormwater sediments and filter press fines to have elevated levels of arsenic and lead.

Native forest vegetation will be replanted on the slopes.

4.1.7 Contingent Remedial Actions

If arsenic is detected in a stockpile characterization sample at concentrations above 20 mg/kg or lead is detected at concentrations above 250 mg/kg, then the segment of the stockpile containing the elevated arsenic or lead will be amended with filter press fines (silt and clay) that have been sorted out of the usable aggregate and mixed again. It is unlikely that filter press fines have elevated levels of arsenic or lead. The stockpiled soil will then be resampled and analyzed following the procedures set forth in the Sampling and Analysis Plan (Appendix B). The amendment, mixing, and re-sampling will occur only for that segment of the stockpile where performance sampling indicates arsenic or lead is present in concentrations exceeding applicable cleanup levels. Amendment and mixing will be performed until the results of compliance sampling indicate that the cleanup levels have been achieved.

4.1.8 Imported Soil

It is not anticipated that imported soil will be used in the cleanup or reclamation. If soil is imported it will be sampled in accordance with the Sampling and Analysis Plan (Appendix B).

4.2 Best Management Practices

This section identifies Best Management Practices (BMPs) that will be implemented to prevent the spread of contaminants during cleanup and protect the health and safety of the public and workers. The mine will maintain coverage under the Sand and Gravel General Permit throughout the duration of mining and remediation of the Cleanup Unit. The Sand and Gravel General Permit includes requirements for monitoring water quality and mitigating potential stormwater impacts such as: implementing BMPs, implementing a Stormwater Pollution Prevention Plan (SWPPP), and monitoring surface water quality to ensure compliance with water quality standards. All the mining activities, and therefore the remediation activities, will be conducted in accordance with the requirements of the Mine Safety and Health Administration (MSHA).

4.2.1 BMPs to Prevent Spread of Contaminants During Cleanup

The following BMPs will be used, when appropriate, to prevent the spread of contaminants during remediation activities. The BMPs were selected from Ecology 2014 Stormwater Management Manual for Western Washington; the BMP numbers presented below reference that manual. These erosion control BMPs are consistent with those identified in the SWPPP for the mine, implemented under the Sand and Gravel General Permit. The specific erosion control BMPs applicable to preventing the spread of contaminants in topsoil during remediation activities are described below.

Dust Control (BMP C140)

Dust control will consist of watering and the use of chemical dust suppressants as necessary on unpaved surfaces and soil stockpiles. Water will be sprinkled on exposed soils until the surface is wet, with careful attention to prevent runoff from excess watering. Dust suppressants, such as polyacrylamide, will be applied in accordance with manufacturer's instructions and cautions regarding handling and application. Dust suppressants will be applied at the minimum required dosage to prevent their transport.

Stormwater Infiltration

During mining and remediation activities within the Cleanup Unit, stormwater generated within the active mining area will be infiltrated. During interim phases, rainwater will infiltrate into the coarse soils exposed by the topsoil removal and mining activities. Once mining has reached final grade, stormwater will be routed to infiltration ponds at the bottom of the existing mine.

Topsoil Stockpiles

BMPs will be applied to topsoil stockpiles to prevent erosion. Specific BMPs include:

Surface roughening (BMP C130) – the surface of slopes steeper than 3H:1V and taller than 5 feet will be roughened by stair-step grading or track walking prior to mulching or seeding. Track walking will be performed by walking a tracked bulldozer, or other heavy equipment, up and down the slope to leave horizontal depressions on the slope.

Mulching (BMP C121) – Mulch will be applied at a thickness of at least 2 inches when necessary to foster seed germination. Site topsoil is anticipated to contain some organic material, so mulching may not be necessary.

Temporary Seeding (BMP C120) – Standard mine reclamation practice is to minimize the time that topsoil is stockpiled. Ideally, topsoil will only be stockpiled long enough to confirm that arsenic and lead concentrations are below applicable cleanup levels. If topsoil is anticipated to be stockpiled for a long duration, temporary seeding will be applied to provide vegetative cover.

Wheel Wash (BMP C106)

An existing wheel wash will be used to clean vehicle tires prior to leaving the mine site to prevent the tracking of soil onto surrounding roadways.

Restricting Off-Road Vehicle Travel

Vehicle travel is restricted to the areas of active disturbance and to previously constructed access roads to prevent unnecessary contact with exposed soils.

Decontamination of Equipment

The dozers and loaders used to excavate, move, and mix topsoil that potentially contains arsenic and lead will be cleaned of loose soil using a broom, brush, or pressurized water. The removed soil will be placed in the soil stockpile that the equipment had been handling.

Mine Reclamation

Only topsoil with arsenic and lead concentrations below applicable cleanup levels will be applied to mined slopes for reclamation. Mine reclamation will be performed in accordance with a Reclamation Permit issued by WDNR and is described in Section 4.1.6.

4.2.2 BMPs to Protect Public and Worker Health and Safety

Limited Site Access

Access to the Cleanup Unit during mining and remediation activities will be restricted to authorized, trained, and/or certified workers. Public access will be restricted in accordance with MSHA requirements.

Worker Health and Safety

The MSHA has authority for employee health and safety during the mining activities on the Cleanup Unit. The workers involved in the mining and remediation activities are trained and certified under MSHA's Part 46 Training Regulations. The MSHA requirements provide safety guidelines that are as stringent as the Occupational Safety and Health Administration standards for the protection of workers.

MSHA requires the mine operators provide site-specific hazard awareness training (Part 46.11) to employees. CalPortland will include additional training specific to the handling of soils potentially containing metals in the site-specific hazard awareness training for equipment operators and all employees that work with topsoil.

CalPortland will notify operators, employees, and construction workers that the property is located within the Tacoma Smelter Plume and may contain contaminated soils and duff.

5 Schedule and Reporting

The cleanup action will be conducted in conjunction with mining activities, which are dependent on variable market conditions and demand for the various types of aggregate to be mined from the Cleanup Unit. Mining and reclamation of the Cleanup Unit will occur in phases, in discrete segments. Mining of the North Parcel and South Parcel is anticipated to take more than 20 years. The cleanup action is anticipated to occur over the same general time frame.

Reporting on the progress of the cleanup action will be conducted annually. An annual report will be submitted to Ecology by November 15 each year. Each annual report will include a summary of the extraction, sampling and analysis, and reclamation performed during the reporting period. Data collected during each reporting period will be submitted into Ecology's Environmental Information Management (EIM) system annually. All laboratory reports will be submitted with each annual report.

There will be a final cleanup report that summarizes all the cleanup and protection activities completed within the Cleanup Unit and on the South Parcel. All laboratory reports will be submitted with the final cleanup report.

6 References

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7 Limitations

Work for this project was performed for the CalPortland (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix E titled "Report Limitations and Guidelines for Use" for additional information governing the use of this report

TABLE

Table 2. Wetland Sediment Sampling Results

Project No. 040001, DuPont South Parcel, DuPont, Washington

			Analyte	Arsenic	Lead
			Unit	mg/kg	mg/kg
			MTCA TSP Model Remedies Guidance Cleanup Levels[1]	14	360
Sample Station	**Sample ID**	**Depth[2]**	**Surface Conditions[3]**		
CP-S01	S01-000004-051219	0-4	Wet	**6.39**	**91.6**
CP-S02	S02-000004-051219	0-4	Wet	**4.64**	**19.7**
CP-S03	S03-000004-051219	0-4	Wet	**4.63**	**6.37**
CP-S04	S04-000004-051219	0-4	Wet	**8.50**	**88.4**
CP-S05	S05-000004-051219	0-4	Wet	**2.04**	**4.61**
CP-S06	S06-000004-051219	0-4	Dry	**2.53**	**10.3**
Average of highest three results (0-4-inch interval):				**6.51**	**66.57**
Average of all results (0-4-inch interval):				**4.79**	**36.83**
CP-S01	S01-004008-051219	4-7.75	Wet	**5.13**	**45.9**
CP-S02	S02-004007-051219	4-6.5	Wet	**8.48**	**79.6**
CP-S03	S03-004007-051219	4-6.75	Wet	**12.3**	**58.8**
CP-S04	S04-004007-051219	4-6.5	Wet	**2.84**	**6.2**
CP-S05	S05-004007-051219	4-7	Wet	**9.16**	**65.4**
CP-S06	S06-004008-051219	4-8	Dry	**1.44**	**12.3**
Average of highest three results (4-8-inch interval):				**9.98**	**67.93**
Average of all results (4-8-inch interval):				**6.56**	**44.70**

Notes:

Samples were collected December 5, 2019 by Anchor QEA, LLC using a hand corer with 2-inch polycarbonate liner.

mg/kg = milligrams per kilogram

Bold indicates the analyte was detected

Exceedances of the cleanup levels are shaded blue.

The wetland boundary was identified in the 2007 Wetland Delineation Report and 2018 Addendum.

1. Model Toxics Control Act (MTCA) Tacoma Smelter Plume (TSP) Model Remedies Guidance Cleanup Levels for protection of benthic invertebrates in freshwater sediment.

2. Depth in inches

3. Surface conditions at the time of sampling.

FIGURES

GIS Path: T:\projects_8\DuPont\DuPontSouthParcel_040001\Delivered\SouthParcelCAP\Q1 Ste Vicinity Map.mxd || Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet || Date Saved: 4/10/2020 || User: erumbarker || Print Date: 4/10/2020

Tacoma Smelter Plume:
Estimated Arsenic Concentrations in Top Six Inches of Soil in mg/kg (ppm)

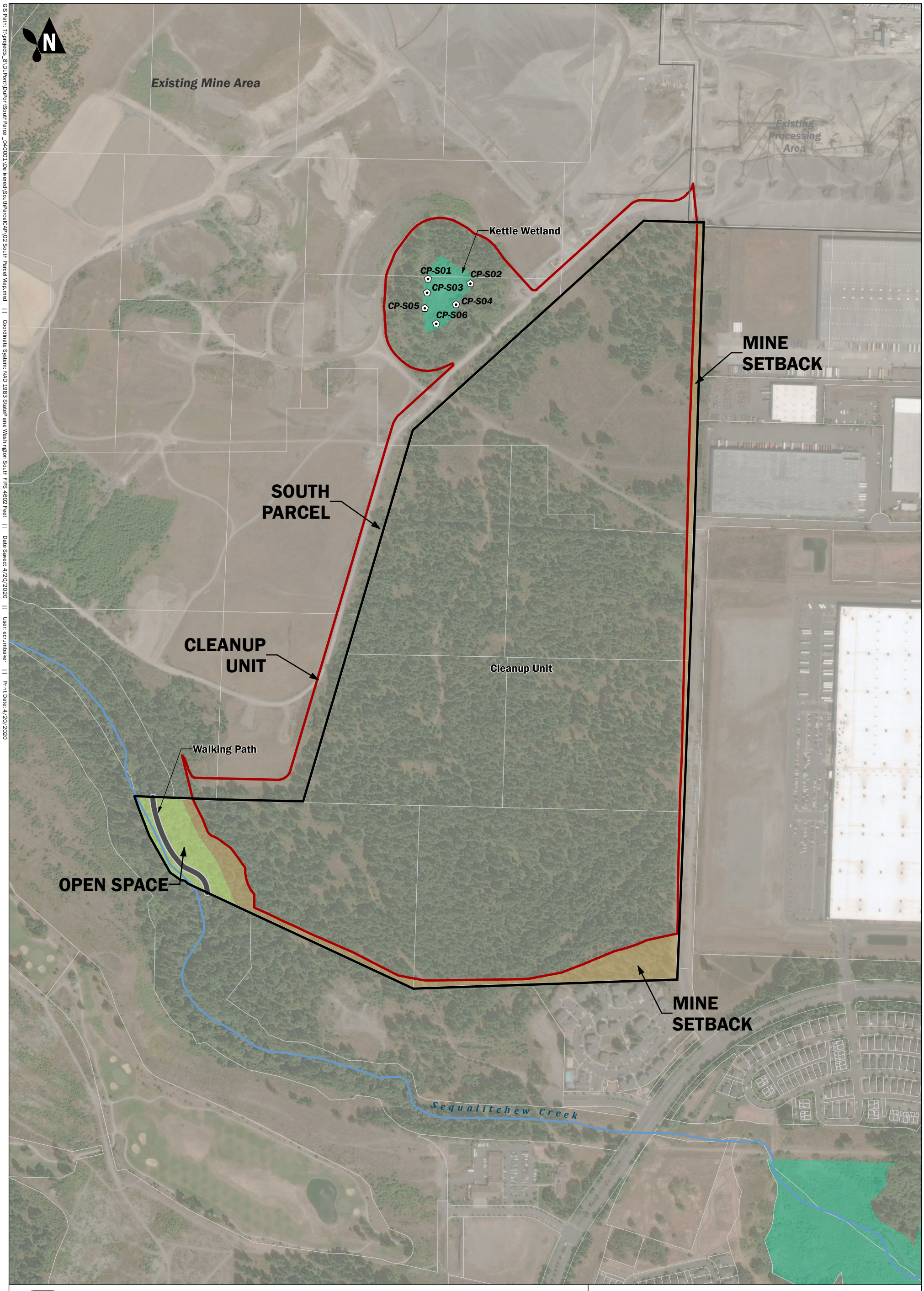
- 40.1 ppm to 100.0 ppm
- Not Evaluated
- Wetland
- Stream
- Water Body

Source: Arsenic data from Ecology June 2012; revised GIS file received January 2018.

Site Vicinity Map

Cleanup Action Plan
DuPont South Parcel
DuPont, Washington

Aspect Consulting	APR-2020	BY: MLK / EAC	FIGURE NO. 1
	PROJECT NO. 040001-015	REVISED BY: RAP / EAC	



South Parcel
Cleanup Unit
Open Space
Mine Setback
Wetland Soil Sample Location[1]
Wetland
Water Body
Stream

0 250 500
Feet

1) Wetland samples collected on 12/5/2019 by Anchor QEA, LLC (Anchor). The Kettle Wetland was delineated by Anchor as described in the 2007 Wetland Delineation Report.

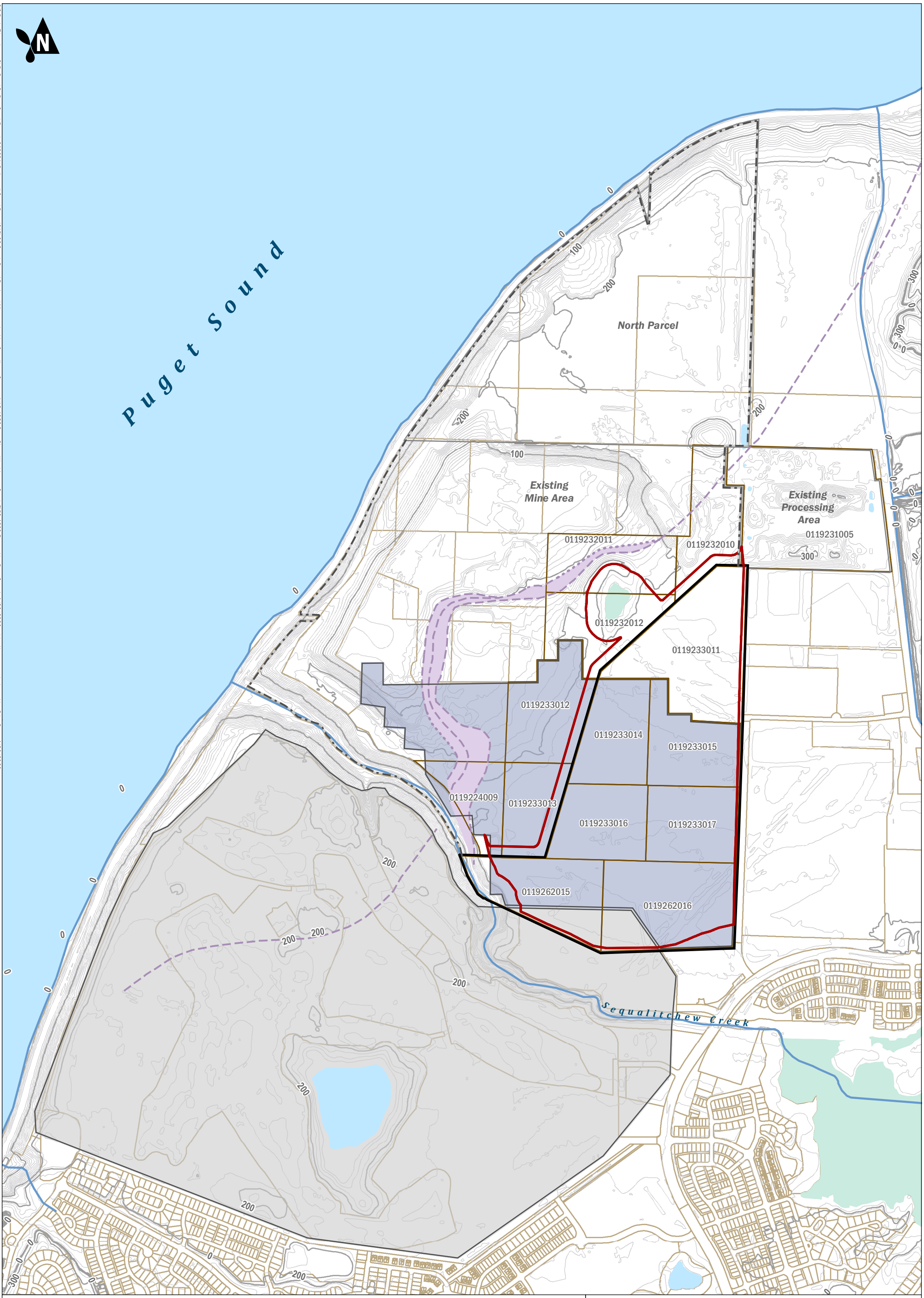
South Parcel Map

Cleanup Action Plan
DuPont South Parcel
DuPont, Washington

Aspect Consulting	APR-2020	BY: MBK / RAP	FIGURE NO. 2
	PROJECT NO. 040001-015	REVISED BY: EAC / OGR	

Basemap Layer Credits || Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

GIS Path: T:\projects_8\DuPont\DuPontSouthParcel_040001\Delivered\SouthParcelCAP\03 South Parcel Regional Map.mxd || Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet || Date Saved: 4/20/2020 || User: ecrumbaker || Print Date: 4/20/2020



South Parcel
Cleanup Unit
Former DuPont Works Site
Parcel 1
Parcel 2/Black Powder Area
Existing Mine Area
Olympia Beds Truncation
dashed where approximate, dotted where inferred
Pierce County Tax Parcel
Wetland
Water Body
Stream

0 500 1,000
Feet

South Parcel Regional Setting Showing Former DuPont Works Site

Cleanup Action Plan
DuPont South Parcel
DuPont, Washington

Aspect Consulting	APR-2020	BY: MBK / RAP	FIGURE NO. 3
	PROJECT NO. 040001-015	REVISED BY: EAC	

Existing Mine Area

Existing Processing Area

Kettle Wetland

MINE SETBACK

SOUTH PARCEL

Walking Path

OPEN SPACE

MINE SETBACK

Sequalitchew Creek

Proposed Mine Expansion Contours

- Proposed 100 ft Contour Line
- Proposed 10 ft Contour Line

Existing Contours

- 100 ft Contour Line
- 10 ft Contour Line

- South Parcel
- Cleanup Unit
- Wetland
- Water Body
- Stream
- Open Space
- Mine Setback

0 250 500
Feet

1) The Kettle Wetland was delineated by Anchor as described in the 2007 Wetland Delineation Report.

Proposed Mine Expansion

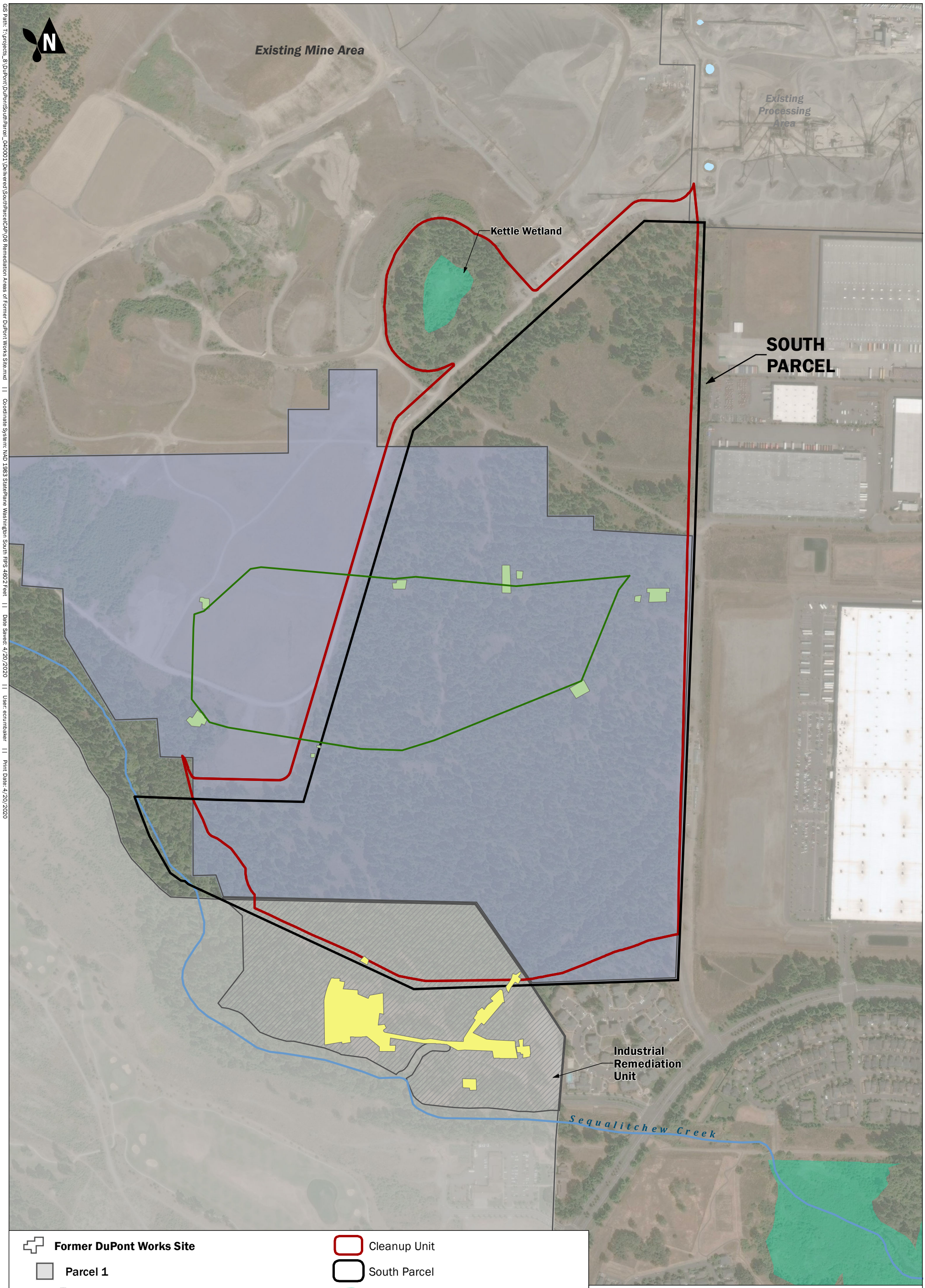
Cleanup Action Plan
DuPont South Parcel
DuPont, Washington

Aspect Consulting	APR-2020	BY: MBK / RAP	FIGURE NO. 4
	PROJECT NO. 040001-015	REVISED BY: EAC	

Zoning Map

Cleanup Action Plan
DuPont South Parcel
DuPont, Washington

Aspect Consulting	APR-2020	BY: MBK / RAP	FIGURE NO. 5
	PROJECT NO. 040001-015	REVISED BY: TDR / EAC	



Remediation Areas of Former DuPont Works Site

Cleanup Action Plan
DuPont South Parcel
DuPont, Washington

Aspect Consulting	APR-2020	BY: MBK / RAP	FIGURE NO. 6
	PROJECT NO. 040001-015	REVISED BY: EAC	

Basemap Layer Credits || Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

GIS Path: T:\projects_8\DuPont\DuPontSouthParcel_040001\Delivered\SouthParcelCAP\06 Remediation Areas of Former DuPont Works Site.mxd || Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet || Date Saved: 4/20/2020 || User: ecrumbaker || Print Date: 4/20/2020

APPENDIX A

Regulatory Records for Cleanup of Former Dupont Works Site

Dupont Weyg.
FS 1269
Parcel 1

FILED
JUL 17 1991
SUPERIOR COURT
BETTY J. GOULD
THURSTON COUNTY CLERK

IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON
FOR THURSTON COUNTY

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY, v. WEYERHAEUSER COMPANY and DUPONT COMPANY	)	No. 91 2 01703 1 CONSENT DECREE

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ATTORNEY GENERAL OF WASHINGTON
Ecology Division
4407 Woodview Drive S.E.

EXHIBITS

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
4407 Woodview Drive S.E.

INTRODUCTION

A. In entering into this Decree (Decree), the mutual objective of the Washington State Department of Ecology and Weyerhaeuser Company and DuPont Company is to provide for remedial action at a facility where hazardous substances have been deposited, placed, stored, or otherwise disposed of. This Decree requires Weyerhaeuser and DuPont (Defendants) to undertake remedial action which includes completion of a Remedial Investigation (RI), Health Risk Assessment (HRA) and Feasibility Study (FS), with the intent of determining a permanent cleanup option for the entire Site. An interim action will also be completed under this Decree.

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

C. In signing this Decree, Defendants agree to its entry and agrees to be bound by its terms.

D. By entering into this Decree, the parties do not intend to discharge nonsettling parties from any liability

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
4407 Woodview Drive S E

they may have with respect to matters alleged in the complaint. Defendants and Ecology retain the right to seek to recover response costs expended pursuant to this Decree from any other responsible parties.

E. The Court is fully advised of the reasons for entry of this Decree, and good cause having been shown: IT IS HEREBY ORDERED, ADJUDGED, AND DECREED AS FOLLOWS:

I. JURISDICTION

A. This Court has jurisdiction over the subject matter and over the parties pursuant to chapter 90.48 RCW; chapter 70.105 RCW; chapter 70.105D RCW; and the Comprehensive Environmental sponse, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq.

B. Under chapter 70.105D RCW, the Model Toxics Control Act (MTCA), and CERCLA, whenever Ecology has reason to believe that a release or threatened release of a hazardous substance will require remedial action, it shall notify potentially liable persons with respect to the release or threatened release. Pursuant to RCW 70.105D.040(4), where Ecology and a potentially liable person reach such a settlement regarding appropriate remedial action, the settlement shall be filed with the appropriate superior court as a consent decree, after public notice and hearing.

C. On the basis of the testing and analysis described in the Statement of Facts, Section IV, and Ecology files and

records, Ecology has determined that past disposal or management practices at the Site have given rise to a release of hazardous substances.

D. Defendants are liable parties for the Site pursuant to RCW 70.105D.040(1) and 42 U.S.C. § 9607 and have been given notice of the release of hazardous substances at the Site and Ecology has determined that they are both liable parties under the MTCA.

E. The actions to be taken pursuant to this Decree are necessary to protect the public health, welfare and the environment, and are consistent with requirements of the MTCA and the National Contingency Plan, 40 CFR Part 300 et seq.

II. PARTIES BOUND

This Decree shall apply to and be binding upon the signatories to this Decree (parties), their successors and assigns. The undersigned representative of each party hereby certifies that he or she is fully authorized to enter into this Decree and to execute and legally bind such party to comply with the Decree. Defendants agree to undertake all actions required by the terms and conditions of this Decree and not to contest state jurisdiction regarding this Decree. No change in ownership or corporate status shall alter the responsibility of Defendants under this Decree. Defendants shall provide a copy of this Decree to each of their agents, including all contractors and subcontractors retained to

ATTORNEY GENERAL OF WASHINGTON
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perform work contemplated by this Decree, and shall condition any contract for such work on compliance with this Decree.

III. DEFINITIONS

A. Site: The Site covers that portion of the former DuPont Works production area located south of Sequalitchew Creek and that portion of the former DuPont Works production area located north of the Creek that includes the former "Burn Area," as shown on the site map (Exhibit C), and the former "Black Powder Area," as shown on the Black Powder Area site map (Exhibit D).

B. Days: Refer to calendar days unless specified otherwise.

C. Parties: Refers to the Weyerhaeuser Company, DuPont Company and the Department of Ecology.

IV. STATEMENT OF FACTS

A. Site Location and Status

The Site is a portion of the former DuPont Works property. The DuPont property (which includes the DuPont Works and adjacent property) covers approximately 3,200 acres located in the southwest corner of Pierce County, Washington, in the City of DuPont. Studies conducted to date by Weyerhaeuser under the supervision of Ecology indicate that 25 areas on the Site, as shown on Exhibits C and D, contain hazardous substances or hazardous waste constituents. DuPont began operations on the property in 1909, and produced a

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variety of commercial explosive materials. The plant was purchased by Weyerhaeuser in 1976 and was closed in 1977. Weyerhaeuser has conducted no manufacturing activities at the Site which involved the generation, use, treatment, storage, disposal or transportation of hazardous substances or dangerous wastes, although the DuPont Company, Southwest Explosives Company and Oriard Powder Company, as lessees of Weyerhaeuser, used certain areas of the Site for the storage and transportation of explosives. Weyerhaeuser has conducted site work consisting of building demolition of former explosives laboratories, removal of above ground and underground storage tanks, and disposal of construction debris.

B. Previous Site Investigations

In 1985, Weyerhaeuser began evaluating 37 potential hazardous waste areas identified by Hart Crowser under contract to Weyerhaeuser on the property. These studies led to the collection in 1986-1987 of soil and waste samples from each area, and extensive analyses of chemical constituent levels (Hart Crowser, 1987). These data revealed that 25 areas on the Site contained elevated levels of at least one hazardous substance or hazardous waste constituent. Identified hazardous substances or hazardous waste constituents present on the property included lead, zinc, nitroglycerine, 2,4,6-trinitrotoluene, 2,4-dinitrotoluene, 2,6-dinitrotolune, monomethylamine nitrate, PCBs, DDT, several

polynuclear aromatic hydrocarbons (PAH) and volatile organic compounds, and oily substances. Hazardous substances and hazardous wastes appeared to be generally restricted to near-surface soils, with lower concentrations reported at depth.

In an effort to determine potential impacts from hazardous substances and hazardous waste releases at the Site, between November 1987 and February 1988, seventeen (17) soil borings were drilled within the former production area and completed as groundwater monitoring wells (Hart Crowser, 1988). The soil borings and associated hydraulic data collected during this effort formed the basis for an assessment of geologic and hydrogeologic conditions at the Site which may control both surface and subsurface contaminant transport.

In March 1988, groundwater and surface water samples were collected from a total of 28 monitoring areas on and adjacent to the Site (Hart Crowser, 1988). These samples were analyzed for a variety of field parameters, including inorganics, metals, oil and grease, explosives, PAHs, PCBs, DDT, and volatile organic constituents identified previously in the soil sampling effort (Hart Crowser, 1987). Some of the monitoring areas were resampled in April 1988 to confirm selected analytical data.

The results of this first round of sampling suggested that local concentrations of nitrate and possibly

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also oil and grease constituents were elevated above local background levels. Additionally, lower than normal Ph levels were found in several wells downgradient from identified waste areas on the property. Levels of nitrate in two of the monitoring wells exceeded primary drinking water standards, although existing water supplies did not appear to be affected. No other elevated concentrations of constituents were detected. Groundwater and surface water quality monitoring continued at quarterly intervals for a period of one year on or about 6/88, 9/88, and 12/88 samplings to assess possible seasonal variations in the principal water quality characteristics of concern (i.e., field parameters, nitrates, nitrogen, dissolved solids, lead, oil and grease, and explosives). This quarterly groundwater sampling revealed the presence of those contaminants noted above and the presence of low levels of explosive compounds, e.g., dinitrotoluene.

With the exception of possible contamination of the sediments at the Site, data collected to date (Hart Crowser 1987 and 1988) are generally sufficient to describe the nature and likely extent of hazardous substances present in the soils and groundwater at the Site. Certain additional remedial investigations, as more particularly described in Exhibits A, B, C, and D (attached), are necessary to complete Site investigations.

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C. Black Powder Area

Recently, data collected pertaining to the Black Powder Area (see Ex. D) reveal that near surface soils in the area contain lead at levels exceeding cleanup standards. Further site investigation is occurring to define the nature and extent of hazardous substances in the Black Powder Area.

D. Independent Cleanups

Prior to entry of this Consent Decree, Weyerhaeuser conducted investigations and cleanup actions at Areas 21, 27, 28, and 29 (formerly referred to as "Sites"). The investigations revealed elevated levels of lead, zinc, and total petroleum hydrocarbons in the soil. Cleanups were conducted by Weyerhaeuser with Ecology oversight, using cleanup guidelines in effect at the time. Ecology will provide a formal review of the independent cleanups conducted to determine if any further action is needed at these sites, based on MTCA cleanup standards in effect, on the effective date of this Decree.

Weyerhaeuser and Dupont are currently engaged in voluntary cleanups of Areas 5 and 6, involving, primarily, the removal of abandoned drums. These cleanups were initiated after work plans describing the work to be performed were approved by Ecology, and will be completed under the Consent Decree.

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E. Conclusion

Based on the facts set forth herein, Ecology has determined that the release and potential release of hazardous substances from the Site requires remedial action to protect the public health and welfare and the environment. This Decree requires remedial actions, including a remedial investigation, feasibility study, and interim action, necessary to protect public health, welfare and the environment.

V. WORK TO BE PERFORMED

This Decree contains a program designed to protect the public health and welfare and the environment from the known release, or threatened release, of hazardous substances or contaminants at, on, or from the Site, and includes contingency measures. This program is set forth in Exhibits A, B, C, and D to this Decree, which are collectively titled and constitute the Remedial Investigation/Feasibility Study Plan (RI/FS). Exhibit A sets forth the work to be performed to accomplish the RI/FS (including an environmental and human health risk assessment). Exhibit B sets forth the schedule for implementing this work (Schedule). Exhibit C is a map of the Site, excluding the Black Powder Area. Exhibit D is a map of the Black Powder Area. Exhibits A, B, C, and D are integral and enforceable parts of this Decree, and the work to be performed pursuant to such Exhibits is consistent with all

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requirements of state and federal laws and regulations, including, without limitation, the MTCA and the National Contingency Plan, 40 CFR Part 300. The terms "Consent Decree" or "Decree" shall include Exhibits A-D whenever used in this document. Except where performance by another party is expressly provided in the exhibits, Defendants hereby commit to perform the work described in Exhibits A, B, C, and D.

A. Work Plan. Pursuant to Ecology's requirements Weyerhaeuser has completed certain remedial investigation and baseline risk assessment work as of the dates set forth in Exhibit B. Defendants shall submit to Ecology additional remedial investigation and feasibility study work by the dates provided in Exhibit B. Any field work conducted by Defendants must include and be consistent with the following plans:

1. Quality Assurance/Quality Control Plan
2. Health and Safety Plan
3. Data Management Plan
4. Sampling and Analysis Plan
5. Community Relations Plan
6. Cultural Resources Comprehensive Management Plan and Cultural Resources Protection Plan
7. Sediment Sampling Plan

The above enumerated plans shall be submitted to Ecology for review, comment, and approval.

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B. Scope of Remedial Investigation. Through previous Site investigation, documented in a Phase I Site Survey and Review Report (Hart Crowser, 1986), a Phase II Site Characterization Report (Hart Crowser, 1987), and a Hydrologic and Water Quality Assessment Report (Hart Crowser, 1988) the vertical and horizontal extent of contamination at the DuPont Site has, for the most part, been determined. To complete the remedial investigation (RI), Defendants shall perform the work plan tasks set forth in Exhibits A, B, C, and D hereto.

C. Scope of Feasibility Study. Based on the results of the remedial investigation and the risk assessment, completed per the requirements of Exhibits A, B, C, and D, a feasibility study of alternative remediation options at the Site shall be conducted. Only those areas within the Site which may exceed an acceptable level of risk to human health or the environment or where levels of hazardous substances exceed cleanup levels will be considered during this effort.

The feasibility study shall be performed in accordance with WAC 173-340-350 and in general accordance with the draft EPA guidelines for Remedial Investigations and Feasibility Studies (EPA, 1988). The feasibility study shall include an initial identification and screening of potential remediation alternatives based on preliminary evaluations of permanence, effectiveness, implementability, and cost. Based on the preliminary screening, a minimum of three (3)

alternatives for each contaminated area shall be selected for more detailed analyses. Areas with identical contaminants may be grouped and treated together. These more detailed evaluations will address in greater detail the use of permanent solutions, short-term and long-term effectiveness, implementability, and cost of each of the final alternatives.

The purpose of the feasibility study is to identify, develop, evaluate, and recommend remedial action alternatives which are consistent with a permanent remedy and which are available to prevent or minimize the release or threatened release of hazardous substances or pollutants or contaminants from the Site, as identified through the remedial investigation and the risk assessment. The feasibility study shall be conducted in accordance with all federal and state laws and regulations, and generally in accordance with all applicable EPA guidance documents relating to feasibility studies.

The remedial investigation and feasibility study for the 25 areas of the Site identified on Exhibits C and D shall be presented in a draft report submitted to Ecology on or before the date 24 months following the effective date of this Decree, depending on the timeliness of Ecology's prior response to the risk assessment. Ecology will provide a final written response to the draft remedial investigation and feasibility study report within 90 days of receipt of the document. Defendants shall submit a final report for the

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remedial investigation and feasibility study no later than 60 days following the receipt of Ecology's final written response.

D. Black Powder Area Interim Action. Within 90 days of the effective date of this Decree, Defendants shall submit a work plan and schedule for an interim action at the Black Powder Area. As stated above, preliminary investigations have revealed that soils in the Black Powder Area are contaminated with lead. This interim action will be designed to define the nature and extent of contamination of the Black Powder Area, and to recommend an appropriate interim action for the area. Ecology will then select the interim action to be implemented. The Defendants will then implement the selected interim action unless Dispute Resolution is invoked, in which case the dispute resolution process set forth in Section XIII of this Decree shall be utilized to resolve the dispute. The interim action will be the subject of threshold determination under the State Environmental Policy Act, Ch. 43.21C RCW.

Upon Ecology's determination that the interim action for the black powder area has been completed in compliance with the approved interim action work plan, that no further remedial action is necessary at the black powder area, and that applicable cleanup standards have been met, Ecology may delete the black powder area from the coverage of this Consent

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Decree. Ecology will only make this determination after public notice and an opportunity to comment.

E. Other Interim Actions. Ecology may, during the term of this Consent Decree, determine that additional interim actions are necessary at the Site under WAC 173-340-430. Likewise, Defendants may, during the term of this Consent Decree, propose additional interim actions.

Upon receipt of notification from Ecology that an interim action is required, Defendants shall plan, propose, initiate, complete, and report upon the required interim action for the Site. Such plans, proposals, and reports shall be subject to review, comment, and approval by Ecology. If Defendants fail to undertake an interim action required by Ecology in a proper and prompt manner, Ecology reserves the right to perform the required interim action and to recover all costs incurred in doing so from Defendants. Defendants may dispute the necessity or appropriateness of any interim action required by Ecology.

F. Future Negotiations Regarding Remedial Action. If the feasibility study, performed pursuant to Section C above, indicates the need for remedial action, as defined by the MTCA or CERCLA, Defendants and Ecology will enter into negotiations regarding such remediation; this will include the design, construction, operation, maintenance, and monitoring phases of such remedial action. The parties recognize and agree that,

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if a remedial action is necessary, it would be beneficial to commence the remedial action during the construction season (Spring, Summer and early Fall). Ecology and Defendants will exercise their good faith efforts to agree upon any necessary remedial action as promptly as possible following submission of the final report due under this Decree. Neither Ecology nor Defendants shall have any obligation pursuant to this Decree to agree upon the terms of any such remedial action, nor shall Defendants have any obligation under this Decree to perform any such remedial action. If the parties do agree upon the terms of a remedial action those terms and the performance of the remedial action shall be the subject of a separate consent decree or an amendment to this Decree.

G. Consistency with Cultural Resources Comprehensive Management Plan. The parties to this Decree recognize the historical and archaeological significance of the Site. Every reasonable effort will be made to ensure that area investigation and remediation will be conducted in a manner consistent with protection of these values. As soon as practicable after execution of this Decree, Defendants shall, in consultation with the State Office of Archaeology and Historic Preservation, prepare a Cultural Resources Comprehensive Management Plan. The Plan shall detail the steps which will be taken, including dispute resolution processes, to protect the archaeological and historical values of the Site. The

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Defendants shall also prepare and submit a Cultural Resources Protection Plan which will ensure that work performed under this Decree will be completed in a manner consistent with the Cultural Resources Comprehensive Management Plan. These plans will be subject to Ecology approval.

VI. DESIGNATED PROJECT COORDINATORS

On or before the entry of this Decree, Ecology, Weyerhaeuser and DuPont shall each designate a project coordinator. Each project coordinator shall be responsible for overseeing the implementation of this Decree. The Ecology project coordinator will be Ecology's designated representative at the Site. To the maximum extent possible, communications between Ecology and Defendants and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Decree, shall be directed through the project coordinators. The project coordinators may designate working level staff contacts for all or portions of the implementation of the remedial work required by this Decree. The project coordinators may agree to minor modifications to the work to be performed without a formal amendment to this Decree.

Any party may change its respective project coordinator. To the extent possible, written notification shall be given to

the other party, in writing, at least ten (10) calendar days prior to the change.

The project coordinator for Ecology is:

Mike Blum
7272 Cleanwater Lane
Mail Stop: LU-11
Olympia, WA 98504-6811

The project coordinator for Weyerhaeuser is:

Vern Moore
Weyerhaeuser Company
P.O. Box 100
Dupont, WA 98327

The project coordinators for DuPont are:

John B. Frazier
Chemicals & Pigments Dept. BOD 918
DuPont Company
1007 Market Street
Wilmington, DL 19898

Chuck Crittenden
DuPont Environmental Remedial Services
P.O. Box 100
DuPont, WA 98327

VII. PERFORMANCE

All response work performed pursuant to this Decree shall be under the direction and supervision, as necessary, of a professional engineer or certified hydrogeologist, or equivalent, with experience and expertise in hazardous waste area investigation and cleanup. Defendants shall notify Ecology as to the identity of such engineer(s) or hydrogeologist(s), and of any contractors and subcontractors

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to be used in carrying out the terms of this Decree, in advance of their involvement at the Site.

VIII. ACCESS

Ecology or any Ecology authorized representative shall have the authority to enter and freely move about all property at the Site at all reasonable times for the purposes of, inter alia: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Decree; reviewing the progress in carrying out the terms of this Decree; conducting such tests or collecting samples as Ecology or the project coordinator may deem necessary; using a camera, video and/or sound recording, or other documentary type equipment to record work done pursuant to this Decree; and verifying the data submitted to Ecology by Defendants. While Ecology reserves its right to enter and inspect the Site, as set forth above, without providing advance notice, Ecology will, in most cases, provide 48-hour advance notice of any Site inspection. Ecology shall, upon request, split any samples with Defendants taken by Ecology during an inspection unless Defendants fail to make available a representative for the purpose of splitting samples. All parties with access to the Site pursuant to this paragraph shall comply with approved health and safety plans.

IX. SAMPLING, DATA REPORTING AND AVAILABILITY

With respect to the implementation of this Decree, Defendants shall make the quality-assured results of all sampling, laboratory reports, and/or test results generated by them, or on their behalf available to Ecology and shall submit these quality-assured results in progress reports submitted in accordance with paragraph X herein. At the request of Ecology, Defendants shall allow split or duplicate samples to be taken by Ecology and/or its authorized representatives of any samples collected by Defendants pursuant to the implementation of this Decree. Defendants shall notify Ecology five (5) working days in advance of any sample collection activity. To the extent practicable, and without limitation on Ecology's rights under Section VIII, Ecology will provide the same five (5) day notice to Defendants and shall, upon request, allow split or duplicate samples to be taken by Defendants or their authorized representatives of any samples collected by Ecology pursuant to the implementation of this Decree.

In addition, Ecology may require Defendants to split any samples collected on their behalf, and thereafter send such samples to different laboratories for analyses in an effort to ensure accurate laboratory results.

X. PROGRESS REPORTS

Defendants shall submit to Ecology written monthly progress reports which describe the actions they have taken during the previous month to implement the requirements of this Decree. Progress reports shall also describe the activities scheduled to be taken during the next month. All progress reports shall be submitted by the tenth day of the month in which they are due after the effective date of this Decree. The progress reports shall include a detailed statement of the manner and extent to which the requirements and time schedules set out in the Decree are being met. Unless otherwise specified, progress reports and any other documents submitted pursuant to this Decree shall be sent by United States mail, to Ecology's project coordinator.

XI. RETENTION OF RECORDS

Defendants shall preserve, during the pendency of this Decree and for ten (10) years from the date of issuance of the Certificate of Completion (Section XXVII) all records, reports, documents, and underlying data in its possession relevant to the implementation of this Decree, or, in the alternative may furnish to Ecology copies of all such records, reports and documents, and shall insert in contracts with project contractors a similar record retention requirements. Upon request of Ecology, Defendants shall make all non-privileged non-archived records available to Ecology and allow

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access for review. All non-privileged archived records shall be made available to Ecology within a reasonable period of time. Ecology agrees, to the extent permitted by law, to maintain the confidentiality of any proprietary information requested.

XII. TRANSFER OF INTEREST IN PROPERTY

No voluntary or involuntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated without provision for continued operation and maintenance of any containment system, treatment system, and monitoring system installed or implemented pursuant to this Decree. Prior to transfer of any legal or equitable interest in all or any portion of the Site upon which a release of hazardous substances is known to have occurred (including, without limitation, all or any portion of the precise geographic area described in Exhibit C) or upon which a containment system, treatment system or monitoring system has been installed or implemented, Weyerhaeuser shall serve a copy of this Decree and all attachments upon any prospective purchaser, lessee, transferee, assignee, or other successor in interest of the property; and, at least thirty (30) days prior to any transfer, Weyerhaeuser shall notify Ecology of said contemplated transfer.

XIII. RESOLUTION OF DISPUTES

If either Defendant objects to any Ecology disapproval, proposed modification, or decision made pursuant to this Decree, it shall notify Ecology in writing of its objections within fourteen (14) calendar days of receipt of such disapproval, proposed modification or decision. Thereafter, the parties shall confer in an effort to resolve the dispute. If agreement cannot be reached on the dispute within fourteen (14) calendar days after receipt by Ecology of such objections, Ecology shall promptly provide a written statement of its decision to Defendants.

If Ecology's final written decision is unacceptable to either Defendant, Defendant has the right to submit the dispute to the Court for resolution. The parties agree that one judge should retain jurisdiction over this case and shall, as necessary, resolve any dispute arising under this Decree. In the event Defendants present an issue to the Court for review, the Court shall review the action or decision of Ecology on the basis of whether such action or decision was arbitrary and capricious and render a decision based on such standard of review. Ecology and Defendants agree to only utilize the dispute resolution process in good faith and agree to expedite, to the extent possible, the dispute resolution process whenever it is used. Where either party utilizes the

dispute resolution in bad faith or for purposes of delay, the other party may seek sanctions.

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

XIV. AMENDMENT OF CONSENT DECREE

This Decree may only be amended by a written stipulation among all the parties to this Decree that is entered by the Court, or by order of the Court. Such amendment shall become effective upon entry by the Court. Agreement to amend shall not be unreasonably withheld by any party to the Decree.

Defendants shall submit any request for an amendment to Ecology for approval. Ecology shall indicate its approval or disapproval within fifteen (15) working days after the request for amendment is received, if additional time is necessary to review the request for amendment Ecology shall notify Defendants within fifteen (15) days whether an extension of the Work Plan schedule is granted during the pendency of Ecology's review of the proposed amendment. Reasons for any disapproval shall be stated in writing. If Ecology does not agree to any proposed amendment, the disagreement may be addressed through the dispute resolution procedures described in Section XIII of this Decree.

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No guidance, suggestions, or comments by Ecology will be construed as relieving Defendants of their obligation to obtain formal approval as may be required by this Decree. No verbal communication by Ecology shall relieve Defendants of the obligation specified herein.

Ecology shall notify Defendants in writing of any Ecology proposed amendment and the basis for such proposal. Defendants shall thereafter comply with such modifications, or if either Defendant does not agree with those modifications, the disagreement shall be addressed through the dispute resolution procedures described in Section XIII of this Decree.

If Ecology adopts regulations applicable to this Decree that would require public participation in the amendment process, such regulations shall be followed in amending this Decree.

XV. EXTENSION OF SCHEDULE

A. An extension of schedule shall be granted only when a request for an extension is submitted in a timely fashion and good cause exists for granting the extension. All extensions shall be requested in writing. The request shall specify the reason(s) the extension is needed. An extension shall only be granted for such period of time is reasonable under the circumstances. A requested extension shall not be effective until approved by Ecology or the Court. Ecology

shall act upon any written request for extension in a timely fashion. It shall not be necessary to formally amend this Decree pursuant to Section XIV when a schedule extension is granted.

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

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

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

3. Endangerment as described in Section XVII. However, neither increased costs of performance of the terms of the Decree nor changed economic circumstances shall be considered circumstances beyond the reasonable control of Defendants.

C. Ecology may extend the schedule for a period not to exceed ninety (90) days, except where an extension is needed as a result of:

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1. Delays in the issuance of a necessary permit which was timely applied for or, if necessary, to comply with permit conditions; or

2. Judicial review of the issuance, non-issuance, or reissuance of a necessary permit; or

3. Other circumstances that reasonably require an extension of more than 90 days; or

4. Endangerment as described in Section XVII; or

5. The need to protect the environment or public interest.

Ecology shall give Defendants written notice in a timely fashion of any extensions granted pursuant to the Decree.

XVI. STIPULATED PENALTIES

A. For delays by Defendants in submitting a report or document or otherwise failing to achieve on time the requirements of this Decree, Ecology may require that Defendants pay into the General Fund of the State Treasury the sum set forth below as stipulated penalties. Defendants stipulate that they shall be obligated to pay such sums as set forth below.

B. Stipulated penalties shall accrue for the following reasons and in the following amounts:

1. Failure to submit a draft environmental risk assessment and feasibility study per agreed-upon schedule: up

to $2,500 per day during the first thirty (30) days; up to $4,000 per day thereafter.

2. Failure to submit a final environmental risk assessment and feasibility study per agreed-upon schedule: up to $2,500 per day during the first thirty (30) days); up to $4,000 per day thereafter.

3. Failure to submit progress reports pursuant to Section X hereof: $500 per day.

4. Failure to provide access to Ecology pursuant to Section VIII hereof: up to $2,500 per day.

C. Defendants shall not be liable for payment under this section if they have submitted a timely request to Ecology for an extension of schedules under Section XV of this Decree and such request has been granted.

D. Upon determination by Ecology that Defendants have failed to make a submittal referenced herein or has otherwise failed to comply with this Decree, Ecology shall immediately give written notice to Defendants of the failure, specifying the provision of the Decree which has not been complied with and specifying the amount of the civil penalty due pursuant to Paragraph B, above. Defendants shall pay the civil penalty within thirty (30) days of receipt of notification from Ecology. Any disagreement over the factual basis for issuance of a penalty under this section shall first be addressed through the dispute resolution clause. In the event

Defendants disagree with the result of the dispute resolution process, Defendants may seek relief from the Court.

E. Nothing herein shall be construed to prevent Ecology from assessing or seeking to impose penalties upon Defendants for any violations of this Consent Decree additional to those specified in subsection B. above, or the Court from imposing such sanctions as it deems appropriate for violations of this Decree or any further order of the Court.

XVII. ENDANGERMENT

In the event Ecology determines or concurs in a determination by another local, state, or federal agency that activities implementing or in noncompliance with this Decree, or any other circumstances or activities, are creating or have the potential to create a danger to the health or welfare of the people on the Site or in the surrounding area or to the environment, Ecology may order Defendants to stop further implementation of this Decree for such period of time as needed to abate the danger or may petition the Court for an order as appropriate.

During any stoppage of work under this section, the obligations of Defendants with respect to the work ordered to be stopped shall be suspended and the time periods for performance of that work, as well as the time period for any other work dependent upon the work which is stopped, shall be extended, pursuant to Section XV of this Decree, for such

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period of time as Ecology determines is reasonable under the circumstances.

In the event Defendants determine that activities undertaken in furtherance of this Decree or any other circumstances or activities are creating an imminent and substantial endangerment to the people on the Site or in the surrounding area or to the environment, Defendants may stop implementation of this Decree for such periods of time necessary for Ecology to evaluate the situation and determine whether Defendants should proceed with implementation of the Decree or whether the work stoppage should be continued until the danger is abated. Defendants shall notify either Ecology field personnel on-site or the project coordinator as soon as is possible, but no later than twenty-four (24) hours after such stoppage of work, and provide Ecology with documentation of its analysis in reaching this determination. If Ecology disagrees with Defendants' determination, it may order Defendants to resume implementation of this Decree. If Ecology concurs in the work stoppage, Defendants' obligations shall be suspended and the time period for performance of that work, as well as the time period for any other work dependent upon the work which was stopped, shall be extended, pursuant to Section XV of this Decree, for such period of time as Ecology determines is reasonable under the circumstances. Any

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disagreements pursuant to this clause shall be resolved through the dispute resolution procedures in Section XIII.

XVIII. OTHER ACTIONS

Ecology reserves its rights to institute remedial action(s) at the Site and subsequently pursue cost recovery, and Ecology reserves its rights to issue orders and/or penalties pursuant to available statutory authority under the following circumstances:

1. Where Defendants fail, after notice, to adhere to any requirement of this Decree;

2. In the event or upon the discovery of a release or threatened release not addressed by this Decree which Defendant, after notice, fail to address;

3. Upon Ecology's determination that action beyond the terms of this Decree is necessary to abate an emergency situation which threatens the public health or welfare or the environment provided, however, that Ecology will first give Defendants notice and opportunity to perform such remedial action unless the threat is so immediate as to not permit the giving of notice; or

4. Upon the occurrence or discovery of a situation beyond the scope of this Decree as to which Ecology would be empowered to perform any remedial action or to issue an order and/or penalty, or to take any other enforcement action. This Decree is limited in scope to the precise geographic area

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described in Exhibit C and to those contaminants which Ecology knows to be at the Site when this Decree is entered.

XIX. INDEMNIFICATION

Defendants agree to indemnify and save and hold the State of Washington, its employees, and agents harmless from any and all claims or causes of action for death or injuries to persons or for loss or damage to property arising from or on account of acts or omissions of Defendants, their officers, employees, agents, or contractors in entering into and implementing this Decree. However, Defendants shall not indemnify the State of Washington nor save nor hold its employees and agents harmless from any claims or causes of action brought by third parties arising out of the negligent acts or omissions of the State of Washington, or the employees or agents of the State, in implementing the activities pursuant to this Decree.

XX. COMPLIANCE WITH APPLICABLE LAWS

All actions carried out by Defendants pursuant to this Decree shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits.

XXI. OVERSIGHT COSTS

Defendants shall reimburse Ecology for its oversight costs in implementing this Decree. Such oversight costs shall be in the amount of Ecology's actual costs of direct activities, support costs of direct activities, and interest

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charges for delayed payments. Defendants and Ecology will consult on a quarterly basis with respect to the oversight costs incurred by Ecology in the prior quarter and the costs Ecology anticipates it will incur in the following quarter, however, nothing herein shall be deemed to limit Ecology's discretion regarding appropriate oversight activities. Oversight costs shall be billed by Ecology and paid by Defendants on a quarterly basis. Any disputes regarding oversight costs shall be subject to dispute resolution pursuant to Paragraph XIII hereof.

XXII. RESERVATION OF RIGHTS

By agreeing to the entry of this Decree, Defendants and Ecology agree to abide by its terms. While the parties believe that the recitals contained in this Decree are accurate, the execution and performance of the Decree do not constitute an admission by either Defendant of any fact or liability for any purpose other than as a basis for the entry of this Decree. Defendants' performance under the Decree is undertaken without waiver of or prejudice to any claims or defenses whatsoever (including, but not limited to the defenses enumerated under RCW 70.105.040, 42 U.S.C. 9607, and RCW 70.105D.040) that may be asserted in the event of further administrative proceedings or litigation about or relating to the Site. Nor is the execution or the performance of the

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Decree an agreement by Defendants to take any action at the Site other than that described in this Decree.

XXIII. CLAIMS AGAINST THE STATE

Defendants hereby agree that they will not seek to recover any costs accrued in implementing RI/FS Work Plan required by this Decree from the State of Washington or any of its agencies; and further, that Defendants will make no claim against the state toxics control account or any local toxics control account or CERCLA for any costs incurred in implementing this Decree. Defendants expressly reserve their right to seek to recover any costs incurred in implementing this Decree from any other potentially liable party, including the United States.

XXIV. IMPLEMENTATION OF REMEDIAL ACTION

If Ecology determines that Defendants have failed without good cause to implement the remedial action required by this Decree, Ecology may, after notice to Defendants, perform any or all portions of the remedial action that remain incomplete. If Ecology performs all or portions of the remedial action because of Defendants' failure to comply with its obligations under this Decree, Ecology may seek to recover from Defendants its costs of doing such work to the extent Ecology is entitled to such cost recovery under state or federal law.

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XXV. COMMUNITY RELATIONS

Ecology shall maintain the responsibility for community relations regarding matters covered by this Consent Decree at the Site, and shall provide notice to Defendants at least 48 hours in advance of giving any public notice or other release of information regarding the Site to the public. However, Defendants shall cooperate with Ecology and shall:

A. Prepare drafts of public notices and fact sheets at important stages of the RI/FS, such as the submission of work plans and the completion of engineering design. Ecology will finalize (including editing if necessary) and distribute such fact sheets and prepare and distribute public notices of Ecology's presentations and meetings;

B. Notify and coordinate with Ecology's project coordinator prior to all press releases and fact sheet preparation, and before major meetings with the interested public and local government;

C. Participate in public presentations on the progress of RI/FS at the Site. Participation may be through attendance at public meetings to assist in answering questions or as a presenter;

D. In cooperation with Ecology, arrange and/or continue information repositories located at the Lakewood Public Library, the South Puget Environmental Education Clearinghouse (SPEECH) Center, and Ecology's Southwest Regional Office. At

a minimum, copies of all public notices, fact sheets, and press releases, all quality assured groundwater, surface water, soil sediment, and air monitoring data, remedial action plans, and supplemental remedial planning documents which are submitted by Defendants to Ecology, relating to performance of the RI/FS required by this Decree, shall be promptly placed in these repositories.

E. Defendants may provide additional public information, but agree to keep Ecology informed of such public information activities.

XXVI. DURATION OF DECREE

This Decree shall remain in effect and the remedial program described in this Decree shall be maintained and continued until Defendants receive a written notice from Ecology that the remedial action plan has been satisfactorily completed, or until the Court determines that the requirements of the Decree have been completed.

XXVII. EFFECTIVE DATE

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

XXVIII. PUBLIC NOTICE AND WITHDRAWAL OF CONSENT

This Decree has been subject to public notice and comment under RCW 70.105D.040(4)(a). Ecology reserves the right to withdraw or withhold its consent to the proposed final Decree if the comments received by Ecology disclose facts or

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considerations which indicate that the proposed Decree is inappropriate, improper, or inadequate.

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

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

By: Carol L. Fleskes — July 17, 1991
Carol L. Fleskes — Date
Program Manager
Toxics Cleanup Program

By: Jay J. Manning — July 17, 1991
Jay Manning, WSBA #13579 — Date
Assistant Attorney General

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Ecology Division
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DUPONT COMPANY

By: _____ _____
Richard A. Romanelli Date
Director, Safety &
Environmental Resources
Dupont Chemicals

By: _____ _____
E. Julia Lambeth Date
Senior Counsel
DuPont Legal

WEYERHAEUSER COMPANY

By: Jack Larsen
Jack Larsen
Vice President

July 10, 1991
Date

By: Ralph H. Palumbo
Ralph H. Palumbo
Heller, Ehrman, White
& McAuliffe
Attorneys for Weyerhaeuser
Company

June 2, 91
Date

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
4407 Woodview Drive S E

Having reviewed the foregoing Consent Decree, it is hereby ordered that the Consent Decree is Entered.

DATED this 22 day of July, 1991.

ROBERT J. DORAN

Superior Court Judge
Thurston County Superior Court

133/weyerhsr.csd

Dupont Way

HARTCROWSER

Earth and Environmental Technologies

Exhibit A
Final Work Plan
(Remedial Investigation, Risk Assessment, and Feasibility Study) and Exhibits B, C, and D
Former Du Pont Works Site
Dupont, Washington

Prepared for
Weyerhaeuser Company
and
Du Pont Company

July 10, 1991
J-1747-49

CONTENTS

EXHIBIT A
FINAL WORK PLAN
(REMEDIAL INVESTIGATION, RISK ASSESSMENT,
AND FEASIBILITY STUDY)
FORMER DU PONT WORKS SITE
DUPONT, WASHINGTON

1.0 INTRODUCTION

This Work Plan outlines the scope of work to complete a Remedial Investigation (RI), Health Risk Assessment, and Feasibility Study (FS) at the Former Du Pont Works Site in Dupont, Washington. The plan describes work which has been completed and reported to Weyerhaeuser Company, Du Pont Company, and the Washington State Department of Ecology (Ecology), as well as work remaining to be conducted.

1.1 RI/FS Process

The State of Washington has established guidelines under WAC 173-340-350 for RI/FSs that will be used as a framework for the development of this study. Relevant federal requirements contained in 40 CFR 300 (National Contingency Plan) will also be addressed. Primary elements of a RI/FS include:

Site Characterization. Field investigations to compile data and assess surface water and sediments, soils, geology and hydrogeology, air quality, land use, natural resources damages, and hazardous substance sources.

Risk Assessment and ARAR Analysis. Assessment of current and potential threats to human health and the environment from hazardous substances and evaluation of applicable or relevant and appropriate requirements (ARARs), with the goal of establishing remedial action objectives.

Evaluation of Cleanup Alternatives. Screening of alternatives and selection of a preferred alternative considering several enumerated factors.

As part of the RI process, detailed work plans will be prepared for the following areas:

- Sampling and Analysis Plan;
- Health and Safety Plan;
- Quality Assurance/Quality Control Plan;
- Data Management Plan; and
- Community Relations Plan.

Many elements of the RI for the Former Du Pont Works Site have been completed and are described within this chapter. Chapters 2.0, 3.0, and 4.0 describe work that is to be completed in support of the RI/FS study.

All work plans, and revisions thereto, will be submitted to Ecology for review, comment and approval per the terms of the Consent Decree between Weyerhaeuser, DuPont, and Ecology. The Health and Safety Plan will be submitted to Ecology for review and comment only. Ecology will be notified of planned field activities according to the requirements of Section IX (Sampling, Data Reporting, and Availability) of that Decree.

Throughout this document, "Site" refers to the entire Former Du Pont Works property under consideration. Specific known waste locations are called "areas." The "areas" have been called sites in the past and may be noted by the particular site name (such as "Site 5").

The RI/FS process will also incorporate sufficient information needed to fulfill requirements of the State Environmental Policy Act (SEPA), if applicable.

1.2 Site Characterization Studies Conducted from 1986 to 1989

Site characterization activities at the Former Du Pont Works Site initially included reconnaissance surveys and historical records reviews. Based on the results of these activities, a preliminary (Phase I) sampling and analysis plan was prepared to verify the presence or absence of suspected contaminants.

The Phase I investigations were initiated in December of 1986 and resulted in the collection of soil samples from test pits and surficial locations within suspected contaminant areas.

Based on the results of the Phase I analyses, further site characterization activities were recommended in areas which exhibited chemical concentrations in excess of general reference (background) levels. A Phase II sampling and analysis plan was subsequently prepared to estimate the volume of materials which exceeded such background concentrations. The Phase II effort was directed toward an impending excavation and off-site disposal remedial action planned for the site. The Phase II investigations were initiated in April of 1987 and included additional test pit, boring, surficial soil, and waste sampling. Altogether, approximately 500 soil samples were collected from the site during both phases of the investigation. Chemical analyses on the samples were performed using EPA- and/or state-approved methodologies.

Following the soil sampling activities described in Hart Crowser (1987), a hydrogeologic and water quality investigation of the site was initiated in November of 1987 to assess possible water quality impacts associated with the identified waste areas. After completion of 16 groundwater monitoring wells installed in selected locations on the property, a quarterly monitoring program of water quality within local groundwaters, springs, and surface waters was initiated. Water quality parameters included in the monitoring program were selected based on the results of the site (soil and waste) characterization efforts. Except for the additional groundwater monitoring described in Section 2.2, the hydrologic monitoring program was largely completed with the fourth quarterly sampling in January 1989. The results of these analyses are summarized in Hart Crowser (1988) and ETI/Hart Crowser (1989).

1.3 Chemical Detection Methods

Of the 141 parameters tested in soil, waste, and/or water samples collected from the property, 38 were detected in at least one sample, and 34 of these analytes were present in at least one sample at levels above background concentrations. The detected chemicals included

four screening parameters (e.g., total oil and grease), five explosive compounds (e.g., 2,6-Dinitrotoluene [2,6-DNT]), five metals (e.g., lead), six volatile organics (e.g., tetrachloroethene), 11 semivolatile organics (e.g., high molecular weight aromatic hydrocarbons [HPAHs] such as chrysene), three pesticides (e.g., 4,4'-DDT), and four PCBs (e.g., Aroclor 1242).

An additional 20 parameters, primarily semivolatile compounds and pesticides, were reported by the laboratory at concentrations below the analytical detection limit ('J' flagged based on CLP protocols) but above estimated background. The presence of these 'J-flag' constituents in the waste areas is suspected, but not confirmed.

The samples with the 'J' flag were included in the risk assessment in accordance with EPA Risk Assessment Guidance for Superfund projects. In those cases where a compound with a 'J' flag was identified (and unqualified) in other areas of the Site in the same media, the estimated concentration was used in the risk assessment. In those cases where the compound with a 'J' was not identified in other areas of the Site, the concentrations were not considered in the risk assessment.

In the FS, the 'J' values will be handled in the same way as in the risk assessment. In those cases where the compound was identified without qualification in other areas, or when there is other evidence that the compound may have been released on the site, the FS alternative evaluation will consider that the 'J' compounds are present in the estimated concentrations. If there is no other evidence that the compound may have been released, then they will not be considered in the FS alternatives.

2.0 ADDITIONAL REMEDIAL INVESTIGATION

The work elements described below were added to the site characterization studies presented in Chapter 1.0.

One of the first tasks that will be conducted during the RI process is compilation of the extensive site characterization work that has been performed for the site. This summary will consolidate all available information on the property and enable analysis of the planned investigative work to determine if further site characterization may be necessary. This summary will be submitted to Ecology for review and comment.

2.1 Surveying and Additional Sampling/Analysis

Additional limited data collection is necessary at the site to complete site characterization and develop remediation alternatives for the identified waste areas. These activities include the following:

- **Surveying.** To the extent practicable, establish the coordinates of previous soil and waste sampling locations utilized in the Phase I and Phase II efforts.

- **TCLP Testing.** Assess those areas containing total lead in excess of applicable cleanup criteria to determine if they exhibit dangerous and/or hazardous waste characteristics based on the TCLP test.

- **Lead and Mercury Boundaries.** Assess the areal and vertical extent of lead at areas which exceed the applicable cleanup standards. In order to support the FS, the estimated boundaries of the lead should be accurate within the range of -20 percent to +50 percent. Only those areas where existing boundary uncertainties exceed this range will be sampled. In addition, ten selected samples collected during the above Lead Boundaries Study will be analyzed for mercury and the site-wide distribution of this contaminant will be characterized.

Each of the additional sampling and analysis tasks is outlined below.

Surveying

As discussed above, the previous Phase I and Phase II site characterization efforts were performed under the assumption that site remediation would proceed immediately thereafter. Consistent with this assumption, only temporary field markers were placed to locate the field positions. However, over the two to three years which have elapsed since sampling, many of these markers have begun to deteriorate. A survey of these positions would ensure the long-term utility of the existing data.

At each of the areas where soil and/or waste sampling was performed during Phases I or II, or subsequent efforts, sampling locations will be surveyed to the extent practicable to establish positions relative to state plane coordinates. For each of the areas which may require subsequent remediation (based on the risk assessment), a semipermanent local benchmark will be established to facilitate activities of the cleanup contractor. A map will be prepared for each area. The survey will locate marks to an accuracy of ± 0.1 foot. The actual sample locations will be located with an accuracy of ± 1 foot by hand taping from markers in each area. In some cases, it may be difficult to locate previous sample locations. In those cases, the reconstructed sample location may be ± 50 feet from the actual location. The accuracy of each reconstructed sample location will be documented.

TCLP Testing

Currently, only areas which contain elevated concentrations of total lead (greater than the applicable cleanup standard) in soils have been tested for EP Tox lead. No samples have yet been tested using TCLP. Based on an analysis of the EP Tox data, the ratio of potentially leachable (EP Tox and/or TCLP) lead to total lead is expected to vary widely, spanning more than two orders of magnitude within one area alone (Hart Crowser, 1987). For this reason, additional sampling is necessary to determine which of the identified lead areas may need to be addressed under the dangerous or hazardous waste regulations (WAC 173-303, 40 CFR Part 261).

At the identified lead areas which have not yet been characterized for TCLP or EP Tox, representative soil samples will be collected and analyzed for TCLP lead and total lead using standard EPA protocols.

Depending upon the size of the area, one to five samples will be collected from each area for analysis. An estimated 37 soil samples (including QC samples) will be collected at these areas. An additional 5 samples from these areas will also be tested using EP Tox procedures to assess the general relationship between these two testing procedures.

Lead and Mercury Boundaries

A number of the areas sampled during the Phase I and Phase II investigations exhibited concentrations of lead which exceeded the applicable cleanup standards for lead. The extent of soil contamination in these areas has not yet been characterized to the desired accuracy of -20 percent to +50 percent stated above.

During or immediately following the surveying conducted under the remedial investigation, soil sampling grids will be established at Sites 2, 4, 7, 16, 18, 25, 26, 30, 31, 36, and 38. Grid spacing will be approximately 30 feet on center or as appropriate for the individual site. Soil samples will be obtained within each grid as surficial (0 to 0.5-foot) five-spot equidistant composites. The soil samples will be analyzed for total lead using the same EPA-approved methodologies used previously. The sampling will continue until the samples around the area boundary meet applicable cleanup standards. This will provide data to determine the cleanup standard isopleth line. An estimated 80 soil samples will be collected at these areas. Mercury analyses will also be performed on ten selected samples to assess the site-wide distribution of this contaminant.

2.2 Additional Groundwater Monitoring Wells

In October 1989, two additional groundwater monitoring wells (MW-18 and MW-19) were installed. MW-19 was drilled midway between existing wells MW-15 and MW-16, and MW-18 was drilled adjacent to well MW-10. The purpose of this task was to obtain groundwater samples from the sea level aquifer at these locations. A staff gage was also installed in Old Fort Lake. The horizontal and vertical location of the new wells and staff gage were surveyed.

Additional groundwater wells will be installed and sampled to permit better definition of the site hydrogeology and to better characterize the extent and magnitude of groundwater contaminants in both the shallow

and, if necessary, deep aquifers. A detailed work plan for installation of additional monitoring wells will be submitted to Ecology for review, comment, and approval.

The procedure used to install and sample the wells and the methods/analyses used to analyze the samples will be presented in detailed work plans.

2.3 Additional Groundwater and Surface Water Sampling

In November 1989 and after the two additional wells were installed, a set of groundwater and surface water samples was obtained and analyzed from the new wells and selected other locations including two "sea level" seeps (Seep 1 and Seep 2) located on the shoreline south of MW-15 and north of Sequalitchew Creek. The sampling locations included:

- Wells MW-1, MW-15, MW-16, MW-17, MW-18, and MW-19; and
- SW-1, Seep 1, and Seep 2.

Samples from these locations were analyzed for the constituents listed below:

- Electrical conductivity;
- Nitrate plus nitrite (EPA Method 353.2);
- Ammonia (EPA Method 350.1);
- Oil and grease (EPA Method 413.2);
- Total dissolved solids (EPA Method 160.1);
- Dissolved organic compounds (VOCs) (Method SW 8240);
- Polynuclear aromatic hydrocarbons (PAHs) (Method SW 8100);
- Explosive compounds - nitroglycerine, trinitrotoluene, and dinitrotoluene (2,4-and 2,6-) (Method SW 8080); and
- Monomethylamine nitrate.

During two interim sampling rounds a series of water level measurements were made in the existing wells which were sampled and the newly installed staff gage in Old Fort Lake. The results of these interim sampling rounds are summarized in a January 18, 1990, and April 3, 1991, reports which present the results of the analyses and have been provided to Ecology.

The specific scope of work for monitoring during the time between execution of the Consent Decree and the start of remediation has not been determined. The scope will be prepared after analysis of the sampling and testing described above. The scope for ongoing sampling may cover groundwater, seeps, surface water, and sediments. The scope will be submitted to Ecology for review, comment, and approval prior to implementing the work.

2.4 Sediment Study

The extent and concentration of metal and petroleum hydrocarbon contamination in the intertidal sediments immediately off-shore of the Site have been assessed by reviewing the 1978 water and sediment quality report for the Nisqually Reach in southern Puget Sound. Results of this assessment are documented in a Hart Crowser letter dated January 24, 1989, which has been reviewed by Ecology.

An additional sediment study will be conducted as part of the RI for the Site. This new study will include sampling and analyses for a wider range of constituents than in the 1978 study, including but not limited to the explosive compounds, monomethylamine nitrate, metals, and petroleum hydrocarbons (PAHs and TPH). An appropriate number of quality control samples will also be collected. The sediment study will include both surficial and core sampling. A sufficient number of samples will be collected at or near the wharf, the sea level seep areas, in the delta formed by Sequalitchew Creek, and at background locations. If there is a need for fish and/or shellfish tissue sampling, it will be addressed in the draft work plan submitted to Ecology. A draft sediment sampling work plan will be submitted to Ecology for review, comment, and approval before the field work is implemented.

2.5 Mercury Investigation at Area 39

Mercury droplets were observed inside the perimeter foundation wall of the Former Du Pont Works laboratory building. A field sampling program was initiated to assess the extent of mercury present around the former laboratory. Surface soil samples were taken inside and outside the foundation walls, and subsurface samples were taken from hand-auger explorations inside the building.

The samples were analyzed for mercury and the results reported in a Hart Crowser letter report dated November 20, 1989.

2.6 Additional Mercury Investigations

Additional work on mercury use, extent, and risk will be performed. The following activities will be accomplished:

- A human health and ecological risk assessment using the existing and additional mercury data to evaluate potential risks due to mercury, and to determine risk-based remedial action concentrations;
- Sampling and analyzing soil around the laboratory to determine areas that exceed the risk-based concentration; and
- Sampling and analysis for mercury at other locations on the site, including other production areas with lead contamination and background locations.

The specific sampling and analysis plan(s) for this work will be submitted to Ecology for review, comment, and approval prior to implementing the work.

2.7 Site Characterization of Areas 5 and 6

Areas 5 and 6 cannot be characterized until drums and other debris have been removed from the steep slopes at these two locations. Weyerhaeuser and DuPont intend to conduct this source removal action during 1990 and 1991. A draft work plan that presents a detailed description of procedures for removal, survey, and segregation of the wastes was prepared by DuPont Environmental and Remediation Services and submitted to Ecology in July 1990. Weyerhaeuser and DuPont also provided Ecology with a work plan for independent oversight by Hart Crowser (including quality assurance of the field chemical testing, documentation of field screening test data, and weekly reporting to Ecology). Ecology has provided comments on these plans, and revisions have been made.

Concurrent with the source removal actions at Areas 5 and 6, a draft work plan for site characterization of the two areas will be prepared

and submitted to Ecology for review, comment, and approval. This plan will be submitted at least 30 days prior to the planned field sampling program and a final work plan incorporating Ecology's comments will be provided prior to any field work.

2.8 Other Investigations

Other investigations may be required based on the results of the remedial investigation, risk assessment, preliminary feasibility studies, and initial cleanup activities. Sampling and analysis of other areas may also be conducted if more refined definitions of the lateral and vertical extent of the contaminants are necessary for the FS. Sampling and analysis plans for other investigations will be submitted to Ecology at least 30 days prior to their respective field sampling program for review, comment, and approval.

As part of the RI/FS process, environmental resources at the site will be described and impacts to the resources will be analyzed.

To ensure that the intent of 43 CFR Part 11, Natural Resource Damage Assessment, will be addressed, a preassessment screening of all site resources will be conducted to analyze potential environmental sensitivities. The process will include preassessment screening, development and review of an assessment plan, quantification of effects, damage determination, and documentation of assessment results. Assessment results will be included in the FS report.

2.9 Former Black Powder Area Investigations

Detailed work plans will be developed to address lead concentrations in the Former Black Powder Area and concentrations of lead in surficial soils in areas outside the Former Black Powder Area. In such areas, appropriate remediation will be proposed if soil concentrations are determined to exceed potentially applicable cleanup standards.

A detailed work plan and schedule for interim action in the Former Black Powder Area will be submitted to Ecology for review, comment, and approval as required by the Consent Decree.1

3.0 RISK ASSESSMENT

A baseline risk assessment was performed for each of the 38 identified waste areas on the Former Du Pont Works Site to assess which areas require remediation and to develop cleanup levels appropriate for each area. The baseline risk assessment was performed in general accordance with EPA's 1989 Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, and Environmental Evaluation Manual, using the five basic interrelated steps:

- Select indicator constituents;
- Estimate exposure point concentrations of indicators;
- Estimate potential human intake of indicators;
- Assess environmental and human health toxicity; and
- Characterize environmental and human health risk.

Based on the results of the site characterization, the indicator constituents were limited to six compounds or compound groupings; lead, monomethylamine nitrate (MMAN), trinitrotoluene and dinitrotoluene (TNT/DNT), nitroglycerine, PCBs, and carcinogenic and total polynuclear aromatic hydrocarbons (PAHs).

The baseline risk assessment considered several different types of potential future land uses at each of the areas, and their impact on the risk evaluation. The land use types considered included open space (e.g., existing conditions), and residential and industrial uses.

The Baseline Risk Assessment report has been submitted to Ecology. A summary of that report is presented below.

Baseline Risk Assessment Summary

In order to evaluate the potential human health and ecological risk posed by the identified contaminants, a risk assessment was conducted for each area on the property. The methodology utilized to perform the risk assessment was based on EPA and Ecology guidance, and combined scientific facts and assumptions to determine the likelihood that people may be sufficiently exposed to the identified chemicals to result in illness. The risk assessment considered the range of potential future land uses at the identified waste areas, including residential, commercial, and open space.

Based on the risk assessment, the chemicals which pose the greatest risks to public health and local ecology are HPAHs and lead. Potential risks from HPAHs and/or lead are primarily via direct soil ingestion exposure routes. HPAHs also exhibited a potential for risk via groundwater exposure, although the analytical basis for this conclusion is considered tenuous (based on limited chemical detections). Five areas contained detectable levels of 2,6-DNT.

Terrestrial and aquatic life ecological risks were qualitatively evaluated at the waste areas. Aquatic life risks were found to be minimal. Those areas that exceeded general public health risks, however, also exhibited a potential for limited wildlife impacts. As discussed in the baseline risk assessment, remediation of the areas to minimize human health risks should also be sufficiently protective of ecological risks.

Additional Risk Assessment

Future work will include a reevaluation of baseline risks throughout the entire site, consistent with current (i.e., 1991) Ecology and EPA guidelines and/or regulations under the MTCA and NCP.

4.0 FEASIBILITY STUDY

4.1 Purpose of this Feasibility Study Work Plan

This chapter of the Work Plan presents the rationale and scope of work for a feasibility study (FS) of identified waste areas located within the Former Du Pont Works Site. The purpose of the FS is to identify, develop, evaluate, and recommend appropriate remediation alternatives which will be protective of human health and the environment and meet applicable laws and regulations. Appropriate remediation objectives will be based on the results of the remedial investigation (RI) of the areas, including the baseline public health and ecological risk assessment. Remediation alternatives will also address Applicable or Relevant and Appropriate requirements (ARARs).

The FS Work Plan will be consistent with the Model Toxics Control Act (MTCA), WAC 173-340, and applicable U.S. Environmental Protection Agency (EPA) guidance documents relating to feasibility studies under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), the Superfund Amendments and Reauthorization Act (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

Since 1985, the Weyerhaeuser Company and their consultant, Hart Crowser, have identified a total of 39 areas on the property which could have received hazardous waste releases from previous uses. Each individual area ranges in size from less than one to several acres. Following site history reviews and field reconnaissance activities, a total of 33 areas were selected for site characterization studies, as described by Hart Crowser (1987) and ETI/Hart Crowser (1989). Evidence for the presence of hazardous wastes at the remaining five areas was lacking, and did not warrant further investigation. Supplemental investigations were conducted at Sites 38 and 39 in 1989.

4.2 Feasibility Study Scope of Work

The FS for the Former Du Pont Works property will include the following steps:

- Identification of remedial action objectives including:

- A risk assessment for the entire site, including risks to the largest exposure population;
- Objectives based on risk assessment; and
- Objectives based on ARARs.

▸ Development of alternatives including:

- Definition of areas and volumes requiring treatment;
- Summarizing RI data and preparing isopleth maps of key contaminants;
- Identification and screening of potential technologies; and
- Assembling various technologies into specific alternatives.

▸ Screening of specific alternatives including:

- Screening evaluation; and
- Selection of alternatives for detailed analysis.

▸ Detailed analysis of selected alternatives.

Each of these steps is discussed below. As per the terms of the Consent Decree, Ecology will be notified of all sampling and analysis activities and plans in advance, to allow Ecology to review, comment, and approve applicable plans and reports.

Task 1 - Treatability Studies

Representative soil materials will be collected from areas of the property which exhibit dangerous waste properties based on the TCLP lead determination. Based on existing data, and depending upon the outcome of additional data analyses, some areas may contain dangerous waste soils. Considering that many of these areas will exhibit similar chemical properties, several areas will be studied for treatability characteristics.

At each area, representative soils will be collected for testing. The samples will be prepared for compaction and chemical testing with varying mixtures of cement and silica-based additions, as well as untreated controls. Chemical testing will include TCLP lead and total lead analyses. The results of these evaluations will enable an assessment of alternative remediation designs.

A review of the treatability of HPAHs using bioremediation/landfarming techniques will also be performed during this task. Using data available in the literature on the degradation of individual HPAH compounds, predicted area-specific HPAH decay rates will be generated for standard landfarming conditions. These data will assist in the assessment of remedial alternatives at the areas.

Task 2 - Remedial Action Objectives

The identification of remedial action objectives (RAOs) will include an assessment of target contaminant concentrations in soil, water, sediments, and biological tissue necessary to achieve various levels of "acceptable" risk and to assure compliance with ARARs. Remediation goals given various individual routes of possible contaminant exposure will also be considered, including direct soil contact and ingestion, dust and vapor inhalation, drinking water consumption, fish and shellfish consumption, and wildlife impacts. Contaminant transport models developed in the RI will be utilized to link on-site soil quality with all exposure routes, since remediation of the soil medium may form the basis of many remedial alternatives.

Another important component in establishing RAOs at the Former Du Pont Works property is land use and its relationship to remediation objectives. The baseline risk assessment identified different exposure conditions for residential, open space, and commercial/industrial uses of the sites. The FS will consider future land uses of the property.

As discussed above, the RAOs are expected to develop directly from the results of the baseline risk assessment, as supplemented by additional evaluations of potential mercury risks. However, the process will also address ARARs and additional concerns communicated by the regulatory agencies (Ecology and DOH). The product of Task 2 will be a technical memorandum which presents preliminary RAOs based on the results of the site characterization work, risk assessment, and ARAR screening. After review and approval by Weyerhaeuser and Du Pont, the memorandum will be submitted to Ecology for review and comment. This task includes one interim meeting with Ecology to discuss RAOs prior to submittal of a Draft Feasibility Study Report. The remedial action objectives will also be an important factor considered in the screening of alternatives, as discussed below.

Task 3 - Identify Possible Remedial Action Technologies

The first step in the task is to define the areas and volume that require remediation. For each area a map will be prepared showing the distribution of key contaminants and the area requiring remediation. Isopleths (showing lines of equal contaminant contamination) will be drawn where possible.

The development of alternatives will include actions from relevant technologies and will include:

- Surface Treatment Technologies;
- Soil and Groundwater Treatment Technologies;
- Disposal Options;
- Institutional Controls;

- Sediment Remediation Technologies, if applicable; and
- No Action.

Due to the characteristics of the sites and the contaminants, certain technologies listed below warrant a close examination. These technologies will include but not be limited to the following:

- Groundwater Pumping/Water Treatment;
- Bioremediation/Landfarming of HPAHs;
- Incineration of Explosives;
- Waste and Debris Removal and Disposal (e.g., Site 5);
- Solidification/Stabilization of Lead; and
- Remediation of Sediments, if applicable.

In most cases, any given technology will not solely meet the ARARs or other remediation objectives. The assemblage of technologies into alternatives will combine those technologies necessary to meet the remediation objectives. Some alternatives, such as no action, are not expected to wholly meet the remediation objectives but are required by the process and will be considered throughout the process. The product of Task 3 will be a technologies table listing possible remediation technologies.

Task 4 - Screening of Technologies

The screening of technologies will produce a set of technologies that are potentially applicable to site remediation. Technologies will be screened based on their technical feasibility and implementability. That is, technologies that are not technically feasible -- usually because they either do not address the site contaminant or are not suitable for the site subsurface conditions -- will be eliminated. For the technology screening, relative cost will be used to distinguish between similar technologies. The product of Task 4 will be a table which lists and provides a basis for including the technologies to develop remedial alternatives.

Task 5 - Identify Possible Remedial Action Alternatives

Applicable remedial technologies screened in Task 4 will be used to develop a list of possible remedial action alternatives. The product of Task 5 will be a table which summarizes the alternatives and their application to the site conditions. Preference shall be given to permanent solutions to the maximum extent practicable, as defined in Chapter 173-340-360 WAC.

Task 6 - Screening of Specific Alternatives

The screening of specific alternatives will produce a subset of specific alternatives deemed suitable for further detailed analysis. The screening process will include a qualitative evaluation of alternative permanence, effectiveness, implementability, and cost. (In general, technically infeasible alternatives will have been eliminated by screening out technically infeasible technologies.) The most important criteria will be permanence, effectiveness, and implementability. Cost will be considered at this stage only if there is a clear disadvantage.

The alternatives with the highest qualitative evaluations will be considered for further analyses. The no action alternative will be continued to the detailed analysis stage.

An interim technical memorandum discussing the alternative screening will be prepared for review which includes the tables and appropriate discussion to support the alternatives proposed for detailed evaluation in Task 7. In addition, at least one interim meeting with the regulatory

agency review group will be scheduled to discuss the alternative screening prior to submittal of the Draft Feasibility Study Report.

Task 7 - Detailed Analysis of Selected Alternatives

The detailed analysis of the selected alternatives will address conceptual engineering of the alternatives, and will also consider the permanence, effectiveness, implementability, and cost of the alternatives. In addition, the anticipated state and community acceptance of the alternatives will be considered. This evaluation will be qualitative although some quantification is necessary (e.g., costs). A recommended alternative for each site will be selected at the completion of this detailed analysis.

Task 8 - Feasibility Study Report

The results of the FS will be summarized in a report that will include the following sections:

- Nature and Extent of Problem (based on risk assessment);
- Objectives of Remedial Action;
- Identification of Technologies;
- Technology Screening Methods and Criteria;
- Summary of Technology Screening;
- Assembled Technologies (Alternatives);
- Alternative Screening Methods and Criteria;
- Summary of Alternative Screening;
- Detailed Analysis Methods and Criteria; and
- Summary of Detailed Analysis.

A Draft Report will be submitted to Ecology for review and comment. After receipt of the agency comments, the draft Final Report suitable for public distribution, review, and comment will be prepared.

5.0 COMMUNITY RELATIONS

Community relations activities will include the following elements:

- Detailed Fact Sheet describing the alternatives studied and the evaluation process;
- Public Notice describing the alternatives and announcing the availability of the draft final feasibility study;
- Informal meetings (if necessary);
- Public meeting (if necessary);
- Fact sheets describing activities occurring at the site during the remedial investigation and feasibility study phases.
- Public Notice via the Site Register of major activities and completion of documents which are available for public review; and
- Development of a site-specific Public Participation Plan.

REFERENCES

ETI/Hart Crowser, 1989, Baseline Risk Assessment, Dupont Works Property.

Hart Crowser, 1987, Site Characterization Report, Phase II Sampling and Analysis, Former Du Pont Works, Dupont, Washington, prepared for Weyerhaeuser Company and Du Pont Company, J-1747-28, August 10, 1987.

Hart Crowser, 1988, Hydrogeologic and Water Quality Assessment, Former Du Pont Works, Dupont, Washington, J-1747-40, May 13, 1988.

EXHIBIT B - SCHEDULE

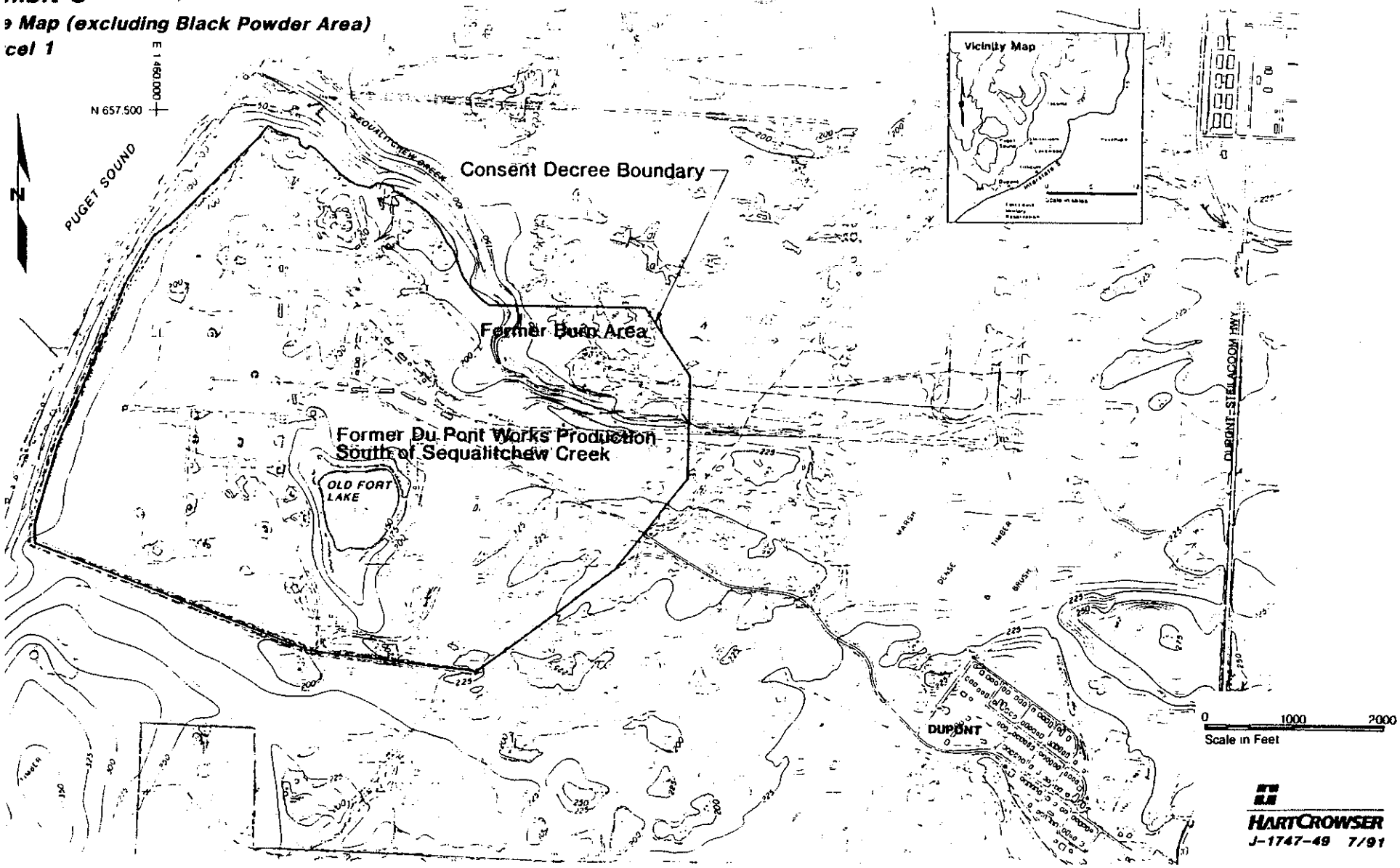
Work Element	Completion Date[1]
Phase I - Remedial Investigation (RI) Site Survey and Review	September 1986
Phase II - RI Site Characterization Report	August 10, 1987
Hydrologic and Water Quality Assessment	May 13, 1988
Results of Second Quarterly Groundwater Sampling	September 9, 1988
Results of Third Quarterly Groundwater Sampling	November 18, 1988
Results of Fourth Quarterly Groundwater Sampling	February 28, 1989
Results of First Interim Groundwater Sampling	January 18, 1990
Results of Second Interim Groundwater Sampling	April 3, 1991
Baseline Risk Assessment	May 1989
Draft Remedial Investigation/Feasibility Study (RI/FS)	24 months after effective date of Consent Decree
Ecology's comments on Draft RI/FS	90 days after submittal of Draft RI/FS
Draft Final RI/FS	60 days after receipt of Ecology's comments

[1]Dates denote when the particular element was actually completed.

hibit C

e Map (excluding Black Powder Area)

cel 1



HARTCROWSER

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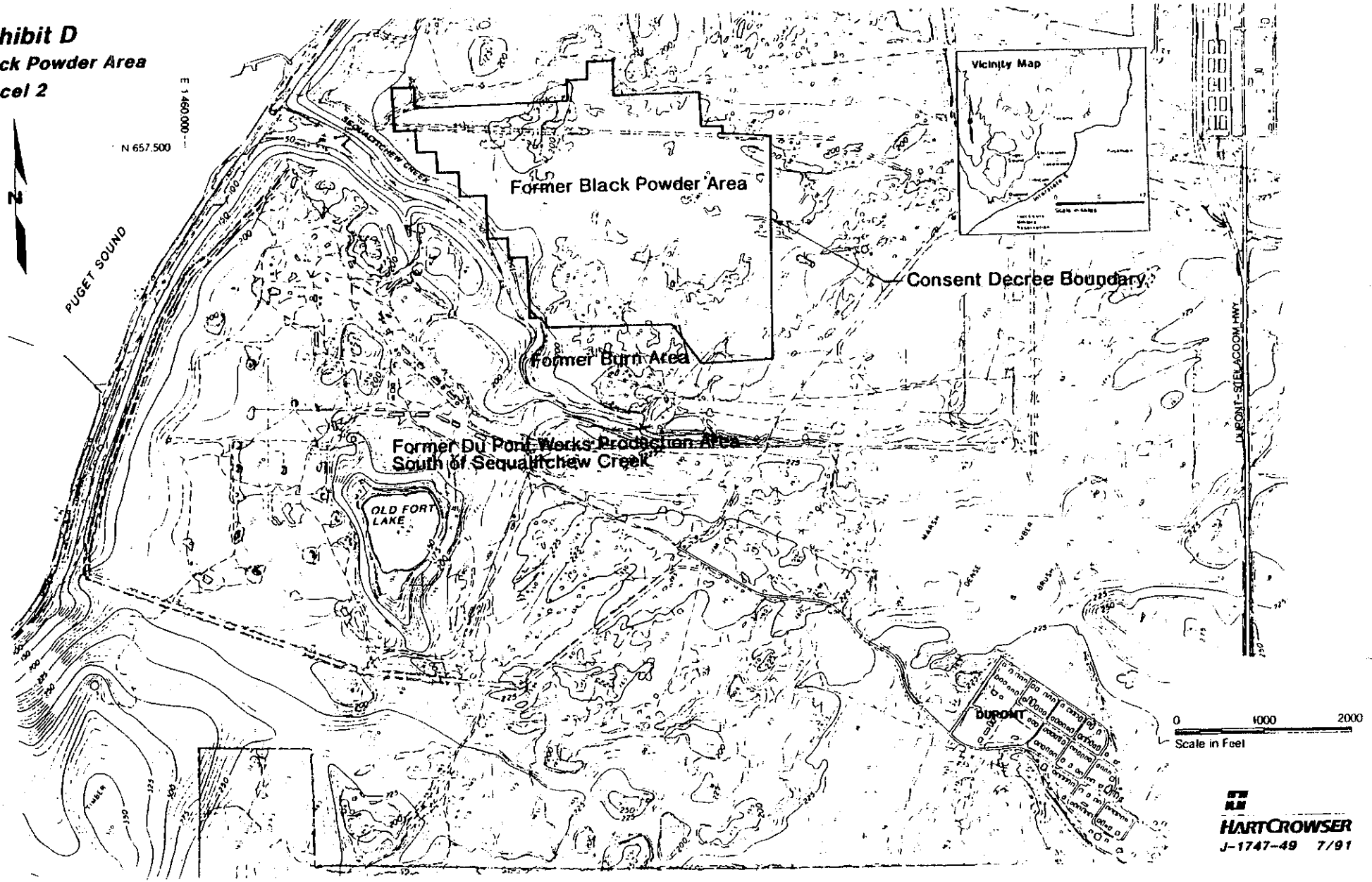
Exhibit D
Black Powder Area
Parcel 2



HARTCROWSER

J-1747-49 7/91

8/15/2003

(Parcel 1)

Site# 1269
SIC# JIAC9
Mgr. Mike Blum

STATE OF WASHINGTON
PIERCE COUNTY SUPERIOR COURT

STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY,

Plaintiff,

v.

WEYERHAEUSER COMPANY and E I. DUPONT DE NEMOURS AND COMPANY,

Defendants.

NO. 03-2-10484-7

CONSENT DECREE

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I. INTRODUCTION

A. In entering into this Consent Decree (Decree), the mutual objective of the Washington State Department of Ecology (Ecology), and Weyerhaeuser Company (Weyerhaeuser) and E I. duPont de Nemours and Company (DuPont) (collectively, Defendants) is to provide for remedial action at a facility where there has been a release or threatened release of hazardous substances. This Decree requires Defendants to undertake the remedial actions identified in Section VI of this Decree, and as more specifically described in Exhibit A, the Cleanup Action Plan.

Ecology has determined that these actions are necessary to protect public health and the environment.

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

C. In signing this Decree, Defendants agree to its entry and agree to be bound by its terms.

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

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

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

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

II. JURISDICTION

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

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

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

D. Ecology has given notice to Defendants, as set forth in RCW 70.105D.020(16), of Ecology's determination that Defendants are potentially liable persons for the Site and that there has been a release or threatened release of hazardous substances at the Site.

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

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

III. PARTIES BOUND

This Decree shall apply to and be binding upon the signatories to this Decree (Parties), their successors and assigns. The undersigned representative of each Party hereby certifies that he or she is fully authorized to enter into this Decree and to execute and legally bind such Party to comply with the Decree. Defendants agree to undertake all actions required by the terms

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and conditions of this Decree and not to contest state jurisdiction regarding this Decree. No change in ownership or corporate status shall alter the responsibility of Defendants under this Decree. Defendants shall provide a copy of this Decree to all agents, contractors and subcontractors retained to perform work required by this Decree and shall ensure that all work undertaken by such contractors and subcontractors will be in compliance with this Decree.

IV. DEFINITIONS

Except for as specified herein, all definitions in WAC 173-340-200 apply to the terms in this Decree.

A. Site: The Site, referred to as the Former DuPont Works Site, is located in southwestern Pierce County, within the City of DuPont, Washington. The Site covers that portion of the former DuPont Works production area located south of Sequalitchew Creek and that portion of the former DuPont Works production area located north of Sequalitchew Creek other than the property known as Parcel 2, which was separately addressed in 1997 and thereby removed from the scope of this Consent Decree. The Site is more particularly described in the detailed site diagram attached to this Decree as Exhibit B.

B. Parties: Refers to the Washington State Department of Ecology, Weyerhaeuser Company, and E.I. duPont de Nemours and Company.

C. Defendants: Refers to both Weyerhaeuser Company, and E.I. duPont de Nemours and Company

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

E. CAP: Refers to the Cleanup Action Plan attached to this Consent Decree as Exhibit A, together with its figures and schedule, all of which are incorporated in this Consent Decree by this reference.

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V. STATEMENT OF FACTS

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

A. Property History: The Site is depicted in Figure 1-1 of the CAP. The property was originally used by Native Americans. In the 1830s, Europeans settled in the area and built Fort Nisqually, which was located in the northern portion of the Site. The Site is part of a larger tract of land, acquired by DuPont in 1906 for the construction of an explosives plant and the historical Village of DuPont as a company town for plant workers. DuPont continued to manufacture explosives at the Site until the mid 1970s, when it sold the property and adjacent areas to Weyerhaeuser. Weyerhaeuser still owns the Site. Activities at the Site during its operation and decommissioning resulted in the accumulation of hazardous substances in soils Site-wide and in groundwater.

B. Site Investigations: Actions taken at the Site subsequent to the manufacturing shutdown in 1976 include the following:

- In 1985, Weyerhaeuser initiated studies to determine whether hazardous substances were present.
- In 1986, a Phase I Site Survey and Review was conducted to identify areas on-Site that may be of environmental concern.
- In 1986, soil contamination was first documented and reported to Ecology.
- In 1987, a Phase II Site Characterization study was performed, which characterized the type, concentration, and distribution of constituents at 38 areas on the Site.
- In 1989, a Baseline Human Health Risk Assessment was performed using results of the Phase II survey.
- In 1991, Weyerhaeuser and DuPont signed a Consent Decree (No. 91-2-01703-1) with Ecology which was entered in Thurston County Superior Court. This required the Companies to complete an Remedial Investigation (RI), Risk Assessment (RA),

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and Feasibility Study (FS) for the Site. The Site was divided into two main areas: Parcel 1 (approximately 636 acres); and Parcel 2 (approximately 205 acres).

- In 1994 and 1995, Draft RI, RA, and FS reports were submitted to Ecology and underwent public review.
- In 1996, based on the result of interim source removal actions, Ecology approved a Cleanup Action Plan for Parcel 2 that provided for no further remediation activities except for institutional controls to maintain the industrial use of Parcel 2.
- In 1997, Parcel 2 was deleted from the 1991 Consent Decree, and the deed restriction requiring institutional controls to maintain the industrial use was recorded in the Pierce County Auditor's Office.
- Between 1990 and 2001, while studies and negotiations were ongoing, Weyerhaeuser and DuPont undertook interim source removal actions to clean up soil and/or debris at the Site, in accordance with MTCA and the 1991 Consent Decree.

C. Interim Remedial Actions: Interim source removals (ISR) have been conducted at the Site between 1990 and 2001 to remove soil and/or debris from specific areas. These ISR activities were undertaken in specific areas which were defined according to historical manufacturing, production and disposal operations at the Site. Ecology-approved removal activities were summarized in a series of ISR memoranda that have been submitted to Ecology.

D. Previous Reports: In 2002, Defendants submitted to Ecology revised drafts of the RI, RA and FS reflecting the condition of the Site subsequent to the removal of contaminated soil and debris in the interim source removal actions. These documents present the basis for the decisions regarding remedial actions selected for the Site.

E. Site Conditions: Based on the studies performed, the following summarizes the nature and extent of contamination for each of the media at the Site:

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1. **Soil:** Site soil contamination consists mostly of lead and arsenic. Lead contamination was detected site-wide. Arsenic contamination was generally detected within 25 feet of the former narrow gauge railroad track beds but also occurs in other discrete areas of the Site. The vertical extent of this contamination is generally confined to a depth of less than one foot below ground surface in all areas except in discrete areas where acid was discharged, drywell locations, some production-related foundations, and disposal areas. The vertical extent is limited to a maximum depth of 24 feet below ground surface in these areas.

There are also isolated small occurrences (representing less than 1% of the total volume of contaminated soils) of additional hazardous substances (including such constituents as total petroleum hydrocarbons (TPH), mercury, di- and trinitrotoluenes (DNT/TNT), and/or benzo(a)pyrene) in soils and debris. These occurrences are of limited (less than 25 feet) lateral extent and are rarely more than 1 foot below ground surface in all areas except where acid was discharged, drywell locations, some production-related foundations, and disposal areas where they may be as deep as 15 feet.

2. **Groundwater:** DNT is the only chemical that is of potential concern in groundwater. DNT concentrations are very low, often below drinking water standards. All other chemicals are either below levels of concern, were not detected, or are below background concentrations.

3. **Surface Water:** Two surface water bodies—Sequalitchew Creek and Old Fort Lake—are within the Site boundary. Sequalitchew Creek is a perennial stream that originates in Sequalitchew Lake east of the Site and discharges into Puget Sound. Old Fort Lake is a small glacial kettle lake that has no inlet or outlet. The lake is fed by groundwater from the water table aquifer, and the lake level is an expression of the water table aquifer.

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Of the wide range of chemical constituents sampled and analyzed within on-site surface waters, only dissolved lead and dissolved copper were detected, but at concentrations within the range of background.

4. **Sediments:** Of the wide range of chemicals for which freshwater sediment samples were analyzed, no chemicals were detected at elevated concentrations. Detected concentrations of metals were comparable to available background sediment data for the Puget Sound region.

VI. WORK TO BE PERFORMED

This Decree contains a program designed to protect public health, welfare and the environment from the known release, or threatened release, of hazardous substances at, on, or from the Site. The requirements of such program are described generally in this section of the Decree. The CAP, Exhibit A, describes the proposed remedial action in greater detail, and includes a schedule for the work to be performed.

A Defendants, through their contractor(s) and subcontractor(s) as necessary, shall perform the following remedial actions at the Site, as summarized below and as further described in the CAP, Exhibit A:

1. Soil Excavation:

Most of the lead and arsenic contaminated soils at the site will be excavated and then consolidated in placement areas. A golf course will be constructed over an area that includes the placement areas and will serve as an engineered cap on the placement areas. Soils with contaminant concentrations higher than the level deemed acceptable for placement under the golf course (the golf course remediation level), and soils contaminated with hazardous substances other that lead and arsenic, will be excavated and disposed of at an off-site hazardous waste landfill.

2. Cultural Resources:

All excavation work within three (3) feet of current ground surface will be monitored by trained archeologists to determine if cultural or archeological artifacts are present. If any artifacts are found they will be treated in the manner described in the Cultural Resource Protection Plan that is part of the CAP.

3. Soil Capping:

Contaminated soil in the area of the former narrow guage railroad track bed in Sequalitchew Creek Canyon will be capped in place with gravel and asphalt.

4. Groundwater Monitoring:

Residual DNT concentrations in Site groundwater will be monitored until such concentrations drop below drinking water standards for four consecutive monitoring intervals.

5. Institutional Controls:

Both physical controls and legal and administrative mechanisms will be used to ensure, to the degree possible, that current and future citizens and wildlife do not come into contact with residual contamination, and that the integrity of the cap/cover containment system is maintained. Institutional controls will take the form of restrictive covenants placed with the deed. The restrictive covenants will limit Site use with the purpose of minimizing disturbance to the cap/cover system, and will prevent any unauthorized excavation on the property.

A deed restriction will limit Site use to commercial, industrial and open space uses. An additional deed restriction will be required for the property inside the golf course footprint that limits this property to that sole use and places restrictions on activities that could disturb the cap/cover.

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A deed restriction shall also be placed upon the Site to restrict the use of groundwater to non-potable uses only.

Defendants agree not to perform any remedial actions outside the scope of this Decree unless the Parties agree to amend the CAP to cover these actions. All work conducted under this Decree shall be done in accordance with WAC 173-340 unless otherwise provided herein.

VII. DESIGNATED PROJECT COORDINATORS

The project coordinator for Ecology is:

Mike L. Blum
Department of Ecology
Southwest Regional Office
PO Box 47775
Olympia, WA 98504-7775

The project coordinator for Weyerhaeuser is:

Robert N. Martin
Weyerhaeuser Company
Mail Stop EC3 3C8
P.O. Box 9777
Federal Way, WA 98063-9777

The project coordinator for DuPont is:

Ronald J. Buchanan
E.I. duPont de Nemours Company
Routes 141 & 48
Barley Mill Plaza, Building 27
Wilmington, DE 19805

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

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The project coordinators may agree to minor modifications to the work to be performed without formal amendments to this Decree. Minor modifications will be documented in writing by Ecology.

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

VIII. PERFORMANCE

All work performed pursuant to this Decree shall be under the direction and/or supervision, as necessary, of a professional engineer or professional hydrogeologist, or equivalent, with experience and expertise in hazardous waste site investigation and cleanup. Any construction work must be under the direction of a professional engineer. Defendants shall notify Ecology in writing as to the identity of such engineer(s) or hydrogeologist(s), or others and of any contractors and subcontractors to be used in carrying out the terms of this Decree, in advance of their involvement at the Site.

IX. ACCESS

Ecology or any Ecology-authorized representatives shall have the authority to enter and freely move about all property at the Site for the purposes of, *inter alia*: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Decree; reviewing Defendants' progress in carrying out the terms of this Decree; conducting such tests or collecting such samples as Ecology may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Decree; and verifying the data submitted to Ecology by Defendants. While Ecology reserves its rights to enter and inspect the Site, as set forth above, in the case of an emergency, in all other instances Ecology will provide reasonable notice and, in most cases, will endeavor to provide 48-hour advance notice of any Site inspection. All parties with access to the Site pursuant to this section shall comply with approved health and safety plans as well as with any other site-access operating procedures reasonably required by Defendants.

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X. SAMPLING, DATA REPORTING, AND AVAILABILITY

With respect to work performed at the Site for the implementation of this Decree, Defendants shall make the quality-assured results of all compliance sampling, laboratory reports, and/or test results generated by them, or on their behalf, available to Ecology and shall submit such results that are quality-assured in accordance with the standards outlined in either the Management Plan for Remedial Investigation/Feasibility Study (Hart Crowser, 1992) or subsequent agreements with Ecology, in accordance with Section XI of this Decree.

If requested by Ecology, Defendants shall allow split or duplicate samples to be taken by Ecology and/or its authorized representatives of any samples collected by Defendants pursuant to the implementation of this Decree. Defendants shall notify Ecology a minimum of seven (7) days in advance of any sample collection or work activity at the Site. Ecology shall, upon request, allow split or duplicate samples to be taken by Defendants or their authorized representatives of any samples collected by Ecology pursuant to the implementation of this Decree provided it does not interfere with the Department's sampling. To the extent practicable, and without limitation on Ecology's rights under Section IX, Ecology shall endeavor to provide the same seven (7) day notice to Defendants prior to any sample collection activity.

XI. PROGRESS REPORTS

Defendants shall submit to Ecology written quarterly progress reports which describe the actions taken during the previous quarter to implement the requirements of this Decree. The progress report shall include the following:

A. A list of on-site activities that have taken place during the quarter;

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

C. Description of all material deviations from the schedule during the current quarter and any planned deviations in the upcoming quarter;

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

E. All quality-assured data received by Defendants during the past quarter and an identification of the source of the sample;

F. A list of deliverables for the upcoming quarter if different from the schedule; and

All progress reports shall be submitted by the tenth day of the first month of the quarter in which they are due after the effective date of this Decree. Unless otherwise specified, progress reports and any other documents submitted pursuant to this Decree shall be hand-delivered, sent by certified mail (return receipt requested), or electronically submitted (receipt confirmed) to Ecology's project coordinator.

XII. RETENTION OF RECORDS

Defendants shall preserve, during the pendency of this Decree and for ten (10) years from the date this Decree is no longer in effect as provided in Section XXV, all records, reports, documents, and underlying data in their possession relevant to the implementation of this Decree, or in the alternative may furnish to Ecology copies of all such records, reports, documents, and underlying data, and shall insert in contracts with project contractors a similar record retention requirement. Upon request of Ecology, Defendants shall make all non-privileged, non-archived records available to Ecology and allow access for review. All non-privileged archived records shall be made available to Ecology within a reasonable period of time. Ecology agrees, to the extent permitted by law, to maintain the confidentiality of any proprietary information requested.

XIII. TRANSFER OF INTEREST IN PROPERTY

No voluntary or involuntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated without provision for ensuring that the integrity of the cap/cover containment system is maintained, that Site use is limited for

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the purpose of minimizing disturbance to the cap/cover containment system, that unauthorized excavation will be prevented, and that use of groundwater is restricted to non-potable uses only.

Prior to transfer of any legal or equitable interest in all or any portion of the property, and for the duration of this Decree, Weyerhaeuser shall serve a copy of this Decree upon any prospective purchaser, lessee, transferee, assignee, or other successor in interest of the property; and, at least thirty (30) days prior to any transfer, Weyerhaeuser shall notify Ecology of said contemplated transfer. Nothing in this Decree is intended to preclude transfer of any legal or equitable interest in a portion of the property at which remedial actions have been completed prior to completion of remedial actions for the entire Site.

XIV. RESOLUTION OF DISPUTES

A. In the event a dispute arises as to an approval, disapproval, proposed modification or other decision or action by Ecology's project coordinator, the Parties shall utilize the dispute resolution procedure set forth below.

1. Upon receipt of the Ecology project coordinator's decision, Defendants have fourteen (14) days within which to notify Ecology's project coordinator of their objection to the decision.

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

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

4. Ecology's Program Manager shall conduct a review of the dispute and shall issue a written decision regarding the dispute within thirty (30) days of

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Defendants' request for review. The Program Manager's decision shall be Ecology's final decision on the disputed matter.

B. If Ecology's final written decision is unacceptable to Defendants, Defendants have the right to submit the dispute to the Court for resolution. The Parties agree that one judge should retain jurisdiction over this case and shall, as necessary, resolve any dispute arising under this Decree. In the event Defendants present an issue to the Court for review, the Court shall review any investigative or remedial action or decision of Ecology made pursuant to RCW 70.105D.030 and RCW 70.105D.050 under an arbitrary and capricious standard of review.

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

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

XV. AMENDMENT OF CONSENT DECREE

This Decree may only be amended by a written stipulation among the Parties to this Decree that is entered by the Court or by order of the Court. Such amendment shall become effective upon entry by the Court. Agreement to amend shall not be unreasonably withheld by any Party to the Decree.

Defendants shall submit any request for an amendment to Ecology for approval. Ecology shall indicate its approval or disapproval in a timely manner after the request for amendment is received. If Ecology does not agree to any proposed amendment, reasons for the disapproval shall be stated in writing, and the disagreement may be addressed through the dispute resolution procedures described in Section XIV of this Decree. If Ecology and

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Defendants agree to substantial changes, Ecology shall provide additional public notice and opportunity to comment.

XVI. EXTENSION OF SCHEDULE

A. Defendants shall inform Ecology of material deviations from the schedule set forth in Figure 6-5 of the CAP, Exhibit A, and shall obtain Ecology's approval for any significant extensions thereto. An extension shall be granted only when a request for an extension is submitted in a timely fashion, generally at least thirty (30) days prior to expiration of the deadline for which the extension is requested, and good cause exists for granting the extension. All extensions shall be requested in writing. The request shall specify the reason(s) the extension is needed.

An extension shall only be granted for such period of time as Ecology determines is reasonable under the circumstances. A requested extension shall not be effective until approved by Ecology or the Court. Ecology shall act upon any written request for extension in a timely fashion. It shall not be necessary to formally amend this Decree pursuant to Section XV when a schedule extension is granted.

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

1. Circumstances beyond the reasonable control and despite the due diligence of Defendants including delays caused by unrelated third parties or Ecology, such as (but not limited to) delays by Ecology in reviewing, approving, or modifying documents submitted by Defendants or in issuing final approval for phases of remediation; provided, neither increased costs of performance of the terms of the Decree nor changed economic circumstances shall be considered circumstances beyond the reasonable control of Defendants; or

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2. "Force majeure" events such as acts of God, including fire, flood, blizzard, extreme temperatures, storm, or other unavoidable casualty; discovery at the Site of subsurface structures, materials or archaeological objects not known at the time of entering into this Consent Decree; or

3. Endangerment as described in Section XVII.

C. Ecology may extend the schedule for a period not to exceed ninety (90) days, except where an extension is needed as a result of:

1. Delays in the issuance of a necessary permit which was applied for in a timely manner, or compliance with permit conditions for which additional time is necessary; or

2. Administrative or judicial review of the issuance, nonissuance, or reissuance of a necessary permit; or

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

4. Endangerment as described in Section XVII.

Ecology shall give Defendants written notification in a timely fashion of any extensions granted pursuant to this Decree.

XVII. ENDANGERMENT

In the event Ecology determines that activities implementing or in noncompliance with this Decree, or any other circumstances or activities, are creating or have the potential to create a danger to the health or welfare of the people on the Site or in the surrounding area or to the environment, Ecology may order Defendants to stop further implementation of this Decree for such period of time as needed to abate the danger or may petition the Court for an order as appropriate. During any stoppage of work under this section, the obligations of Defendants with respect to the work under this Decree which is ordered to be stopped shall be suspended and the time periods for performance of that work, as well as the time period for any other

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work dependent upon the work which is stopped, shall be extended, pursuant to Section XVI of this Decree, for such period of time as Ecology determines is reasonable under the circumstances.

In the event Defendants determine that activities undertaken in furtherance of this Decree or any other circumstances or activities are creating an endangerment to the people on the Site or in the surrounding area or to the environment, or to archaeological objects, Defendants may stop implementation of this Decree for such period of time necessary for Ecology to evaluate the situation and determine whether Defendants should proceed with implementation of the Decree or whether the work stoppage should be continued until the danger is abated. Defendants shall notify Ecology's project coordinator as soon as possible, but no later than twenty-four (24) hours after such stoppage of work, and thereafter provide Ecology with documentation of the basis for the work stoppage. If Ecology disagrees with Defendants' determination, it may order Defendants to resume implementation of this Decree. If Ecology concurs with the work stoppage, Defendants' obligations shall be suspended and the time period for performance of that work, as well as the time period for any other work dependent upon the work which was stopped, shall be extended, pursuant to Section XVI of this Decree, for such period of time as Ecology determines is reasonable under the circumstances. Any disagreements pursuant to the clause shall be resolved through the dispute resolution procedures in Section XIV.

XVIII. COVENANT NOT TO SUE; OTHER ACTIONS

In consideration of compliance by Defendants (including any successors in interest as determined by RCW 70.105D.040(4)(e) and (f) or successor provisions) with the terms and conditions of this Decree, Ecology agrees that compliance with this Decree shall stand in lieu of any and all administrative, legal, and equitable remedies and enforcement actions available to Ecology against Defendants for the release or threatened release of known or suspected hazardous substances at the Site covered by the terms of this Decree.

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Ecology reserves its rights to institute remedial action(s) at the Site and subsequently pursue cost recovery, and Ecology reserves its rights to issue orders and/or penalties or take any other enforcement action pursuant to available statutory authority under the following circumstances:

A. Where Defendants fail, after notice and opportunity to cure, to comply with any requirement of this Decree;

B. In the event or upon the discovery of a release or threatened release not addressed by this Decree which Ecology determines to present a previously unknown threat to human health and the environment, and to which Defendants, after notice, fail to address, so long as the release or threatened release is of hazardous substances not known by Ecology to be present at the Site at the time this Decree is entered;

C. Upon Ecology's determination that action beyond the terms of this Decree is necessary to abate an emergency situation which threatens public health or welfare or the environment; provided, however, that Ecology shall first give Defendants notice and opportunity to perform such abatement unless the threat is so immediate as to preclude notice; or

Upon the occurrence or discovery of a situation beyond the scope of this Decree as to which Ecology would be empowered to perform any remedial action or to issue an order and/or penalty, or to take any other enforcement action. This Decree is limited in scope to the geographic Site described in Exhibit B and to those hazardous substances which Ecology knows to be at the Site when this Decree is entered.

Ecology reserves the right to take any enforcement action whatsoever, including a cost recovery action, against potentially liable persons not party to this Decree.

XIX. INDEMNIFICATION

Defendants agree to indemnify and save and hold the State of Washington, its employees, and agents harmless from any and all claims or causes of action for death or

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injuries to persons or for loss or damage to property arising from or on account of acts or omissions of each Defendant, its officers, employees, agents, or contractors in entering into and implementing this Decree. However, Defendants shall not indemnify the State of Washington nor save nor hold its employees and agents harmless from any claims or causes of action arising out of the negligent acts or omissions of the State of Washington, or the employees or agents of the state, in implementing the activities pursuant to this Decree. Failure to comply with provisions of the Site Health and Safety Plan shall be deemed negligence.

XX. COMPLIANCE WITH APPLICABLE LAWS

A. All actions carried out by Defendants pursuant to this Decree shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in paragraph B of this section.

B. Pursuant to RCW 70.105D.090(1), the substantive requirements of RCW 70.94, 70.95, 70.105, 75.20, 90.48, and 90.58 and of any laws requiring or authorizing local government permits or approvals for the remedial action under this Decree that are known to be applicable at the time of entry of the Decree have been included in the CAP, Exhibit A, and are binding and enforceable requirements of the Decree.

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

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agencies believe are applicable to the remedial action. Ecology shall make the final determination on the additional substantive requirements that must be met by Defendants and on how Defendants must meet those requirements. Ecology shall inform Defendants in writing of these requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of this Decree. Defendants shall not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

Ecology shall ensure that notice and opportunity for comment is provided to the public and appropriate agencies prior to establishing the substantive requirements under this section.

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

XXI. REMEDIAL ACTION COSTS

The Defendants agree to pay remedial action costs incurred by Ecology pursuant to this Decree as permitted by RCW 70.105D and WAC 173-340-550. These costs shall include work performed by Ecology or its contractors for, or on, the Site under RCW 70.105D both prior to and subsequent to the issuance of this Decree for investigations, remedial actions, and Decree preparation, negotiations, oversight and administration. Ecology costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). The Defendants agree to pay the required amount within ninety (90) days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general statement of work performed will be provided upon request. At the request

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of Defendants, Defendants and Ecology will consult on a quarterly basis with respect to remedial action costs incurred by Ecology in the prior quarter and the costs Ecology anticipates it will incur in the following quarter; provided, however, that nothing herein shall be deemed to limit Ecology's discretion regarding appropriate remedial action costs. Itemized statements shall be prepared quarterly. Failure to pay Ecology's costs within ninety (90) days of receipt of the itemized statement will result in interest charges. Any disputes regarding remedial action costs shall be subject to dispute resolution pursuant to Section XIV.

XXII. IMPLEMENTATION OF REMEDIAL ACTION

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

XXIII. FIVE YEAR REVIEW

As remedial action, including ground water monitoring, continues at the Site, the parties agree to review the progress of remedial action at the Site, and to review the data accumulated as a result of Site monitoring as often as is necessary and appropriate under the circumstances. At least every five (5) years the parties shall meet to discuss the status of the Site and the need, if any, of further remedial action at the Site. Ecology reserves the right to require further remedial action at the Site under appropriate circumstances. This provision shall remain in effect for the duration of the Decree.

XXIV. PUBLIC PARTICIPATION

Ecology shall maintain the responsibility for public participation at the Site. However, Defendants shall cooperate with Ecology and, if agreed to by Ecology, shall:

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A. Prepare drafts of public notices and fact sheets at important stages of the remedial action. Ecology will finalize (including editing if necessary) and distribute such fact sheets and prepare and distribute public notices of Ecology's presentations and meetings. Ecology will provide Defendants with an opportunity to review and approve any drafts or edits prepared by it prior to distribution;

B. Notify Ecology's project coordinator prior to the issuance of all press releases and fact sheets, and before major meetings with the interested public and local governments. Likewise, Ecology shall notify Defendants prior to the issuance of all press releases and fact sheets, and before major meetings with the interested public and local governments;

C. Participate in public presentations on the progress of the remedial action at the Site. Participation may be through attendance at public meetings to assist in answering questions, or as a presenter;

D. In cooperation with Ecology, arrange and/or continue information repositories to be located at Lakewood Public Library and Ecology's Southwest Regional Office at 300 Desmond Drive, Lacey, Washington 98504-7775. At a minimum, copies of all public notices, fact sheets, and press releases; all quality-assured groundwater, surface water, soil, and air monitoring data; remedial actions plans, supplemental remedial planning documents, and all other similar documents relating to performance of the remedial action required by this Decree shall be promptly placed in these repositories.

XXV. DURATION OF DECREE

This Decree shall remain in effect and the remedial program described in the Decree shall be maintained and continued until Defendants have received written notification from Ecology that the requirements of this Decree have been satisfactorily completed, or until the Court determines that the requirements of the Decree have been satisfied.

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XXVI. CLAIMS AGAINST THE STATE

Defendants hereby agree that they will not seek to recover any costs accrued in implementing the remedial action required by this Decree from the State of Washington or any of its agencies; and further, that Defendants will make no claim against the State Toxics Control Account or any Local Toxics Control Account for any costs incurred in implementing this Decree. Except as provided above, however, Defendants expressly reserve their right to seek to recover any costs incurred in implementing this Decree from any other potentially liable person.

XXVII. CONTRIBUTION PROTECTION

With regard to claims for contribution against Defendants for matters addressed in this Decree, Ecology agrees that Defendants (including any successors in interest as determined by RCW 70.105D.040(4)(e) and (f) or successor provisions) are entitled to protection from contribution actions or claims as provided by RCW 70.105D.040, or as otherwise provided by law.

XXVIII. DEFENDANTS' RESERVATION OF RIGHTS

Defendants reserve all rights and defenses which they may have and which are not otherwise addressed in this Decree.

XXIX. EFFECTIVE DATE

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

XXX. PUBLIC NOTICE AND WITHDRAWAL OF CONSENT

This Decree has been the subject of public notice and comment under RCW 70.105D.040(4)(a). As a result of this process, Ecology has found that this Decree will lead to a more expeditious cleanup of hazardous substances at the Site.

If the Court withholds or withdraws its consent to this Decree, it shall be null and void at the option of any party and the accompanying Complaint shall be dismissed without costs

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and without prejudice In such an event, no party shall be bound by the requirements of this Decree.

CHRISTINE O. GREGOIRE
Attorney General

STEVEN J. THIELE, WSBA #20275
Assistant Attorney General
Attorneys for Plaintiff
State of Washington,
Department of Ecology

DEPARTMENT OF ECOLOGY

JAMES J. PENDOWSKI
Program Manager
Toxics Cleanup Program

E.I. DUPONT DE NEMOURS & COMPANY

JAMES B. PORTER, JR.
Vice President
Engineering & Operations

WEYERHAEUSER COMPANY

SARA KENDALL
Vice President
Environment, Health & Safety

DATED this 15th day of August, 2003.

~~JUDGE~~ Court Commissioner Pro Tem
Pierce County Superior Court

PRO TEM
ROBERT NETTLETON

ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
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DuPont Weyerhaeuser Parcel 2

BK 1428PG3399

9712230865

After Recording Return To:
Terri L. Vancil
Weyerhaeuser Real Estate Company
WRE 1-1
P.O. Box 2999
Tacoma, WA 98477-2999

97 DEC 23 PM 3:59

RECORDED
CATHY PEARSALL-STIPEK
AUDITOR PIERCE CO. WASH

Document Title(s) (or transactions contained therein): 1. **Declaration of Restrictive Covenant** 2. 3. 4.
Grantor(s) Name (last, first, and initials): 1. **Weyerhaeuser Real Estate Company** 2. 3. 4. 5. ☐ Additional Names on Page _____ of Document TRANS 9724867W DEC 23 1997
Grantee(s) Name (last, first, and initials): 1. **The Public** 2. 3. 4. ☐ Additional Names on Page _____ of Document
Legal Description (Abbreviated i.e. lot/block and plat or section, township and range) **A portion of the Southeast quarter of Section 22 AND a portion of the South half of Section 23 AND a portion of the North half of Section 26 AND a portion of the Northeast quarter of Section 27, ALL in Township 19 North, Range 1 East, W.M., City of DuPont, County of Pierce, State of Washington.** Legal Description is on **pages 7 and 8** of Document.
Reference Number(s) of Documents Assigned or Released: 1. None 2. 3. 4. ☐ Additional Reference Numbers on Page _____ of Document
Assessor's Tax Parcel / Account Number(s) a portion of 01-19-23-3-005 01-19-26-2-005 01-19-22-3-001

DECLARATION OF RESTRICTIVE COVENANT

This Declaration of Restrictive Covenant is made this 9 day of December, 1997, by the Weyerhaeuser Real Estate Company ("Weyerhaeuser") the fee title owner of the real property herein described, in favor of the State of Washington, Department of Ecology ("Ecology").

The property that is the subject of this Restrictive Covenant was the subject of remedial action under the Washington Model Toxics Control Act ("MTCA") Chapter 70.105D RCW. This Restrictive Covenant is required by RCW 70.105D.030(1)(g) and WAC 173-340-440 (as amended 1/96) because an "industrial soil" cleanup standard was selected for soils on the site under WAC 173-340-745, resulting in residual concentrations of contaminants which exceed Ecology's residential soil cleanup standards. The remedial action undertaken to clean up the property is described in the Consent Decree entered in State of Washington vs. Weyerhaeuser Co., Inc and DuPont Co., Inc., Pierce County Cause No. 91-2-01073-1 and in a Cleanup Action Plan dated March 4, 1997. The Cleanup Action Plan is on file and available for inspection at the Washington State Department of Ecology, Toxics Cleanup Program, P.O. Box 47775, Olympia, WA 98504-7775.

The property, known as the "Former DuPont Works Site" ("Property") is an 841-acre parcel of real property located in Pierce County, more particularly described in Exhibit A attached hereto and made a part hereof. The property is divided into two separate parcels identified as Parcels 1 and 2, Parcel 2 consisting of 205 acres located north of Sequalitchew Creek.

In the Cleanup Action Plan, Ecology selected a "cleanup action" for the Property, which provides for the following actions:

> Establishment of Institutional Controls (environmental protection easement and deed restriction) in affected areas to prevent uses of the real property other than traditional industrial uses, such as processing or manufacturing of materials, marine terminal and transportation areas and facilities, fabrication, assembly, treatment or distribution of manufactured products, or storage of bulk materials and other uses permitted on industrial properties by the MTCA;

With the exception of the establishment of institutional controls in affected areas, no further cleanup action is required on Parcel 2. As a result of interim cleanup actions now complete, Parcel 2 soils, surface water and ground water meet cleanup standards for industrial properties under the MTCA, as described in WAC 173-340.

Weyerhaeuser intends to subdivide and sell portions of Parcel 2 only to persons that would use the property for traditional industrial uses. Portions of the property, in the existing condition or after performance of cleanup actions, may meet soil, surface water and ground water cleanup standards under the MTCA for residential and/or commercial properties, and, in such case, Weyerhaeuser or its successors and assigns may elect to apply to Ecology for removal of this Restrictive Covenant for those portions.

Weyerhaeuser and Ecology have agreed that it is appropriate and necessary to: 1) impose deed restrictions on the Property as a covenant that will run with the land for the purpose of ensuring that uses of the Property will be limited to the traditional industrial uses; 2) grant a right of access to Ecology for the purpose of monitoring and enforcing the industrial use deed restrictions imposed on the Property; and 3) grant a right of access to Ecology for the purpose of reviewing, facilitating and approving or disapproving any application made by Weyerhaeuser and its successors and assigns to remove the industrial use deed restrictions.

Weyerhaeuser makes the following declaration as to limitations, restrictions, and uses to which the Property may put, and specifies that such declarations shall constitute covenants to run with the land, as provided by law, and shall binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Property. No conveyance of title, easement, lease, or other interest in the Property shall be consummated the property owner without adequate and complete provision for the continued observation of this Restrictive Covenant.

It is the purpose of this instrument to give Ecology the right to ensure that the Property will be used only for traditional industrial uses, and to ensure that the property will not be used in a manner that will pose a threat to human health or the environment, and to give Ecology the exclusive right to determine whether and to what extent the deed restriction may be removed from all or any of the Property.

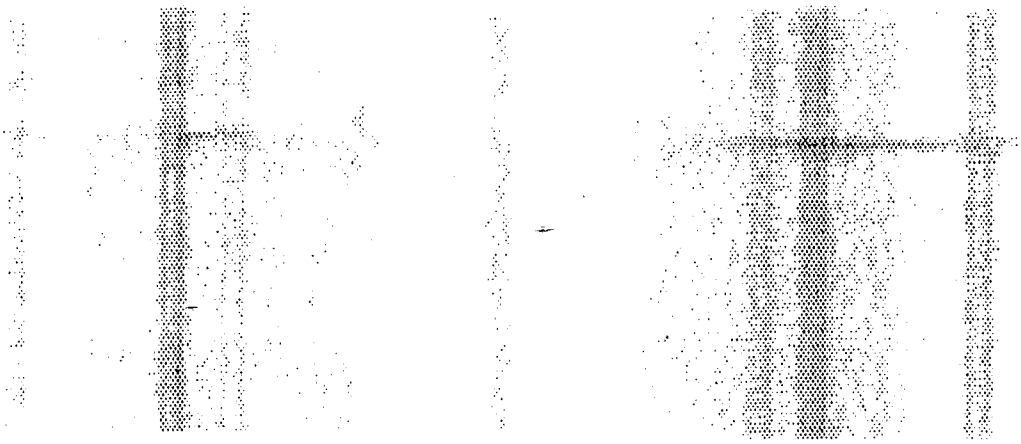
The following covenants, conditions and restrictions apply to the use of the Property, run with the land and are binding on Weyerhaeuser and its successors and assigns.

Section 1. **Restrictions on Use.** Parcel 2 of the Property shall not be developed or used for any activity other than the traditional industrial uses, as described in RCW 70.105D.020(22), and as defined in and allowed under the City of DuPont zoning regulations and Comprehensive Plan (July 1995) for "industrial" uses.

Section 2. **Access.** The owner shall allow authorized representatives of Ecology, or of a successor agency, the right to enter the Property at reasonable times for the purpose of:

a) monitoring and enforcing this restrictive covenant;
b) verifying data or information submitted to Ecology;
c) verifying that no action is being taken on the Property in violation of the terms of this instrument; and,
d) monitoring future investigations or cleanup actions, if any, on the Property performed in connection with a request for modification or termination of deed restrictions, including, without limitation, obtaining split or duplicate samples.

Section 3. **Modification or Termination.** The owner of the Property and its successors and assigns reserve the right under WAC 173-340-440 to record an instrument



which provides that this Restrictive Covenant shall no longer limit use of the Property or be of any further force or effect. However, such an instrument may be recorded only with the consent of Ecology, or of a successor agency. Ecology or its successor may consent to the recording of such an instrument only after public notice and comment. Any application to modify or terminate this restriction shall be submitted to Ecology and shall include soil sampling and analytical data for the real property with respect to which the application is made, and a description of the use of the real property that is planned by the applicant, if such use is other than a traditional industrial use. In making any determination to modify or terminate the deed restrictions with respect to real property for which non-industrial use is planned by the applicant, Ecology shall apply the requirements of MTCA, the MTCA Cleanup Regulation, and the cleanup standards applicable to such uses at Parcel 1.

Section 4. **Reserved Rights.** Weyerhaeuser reserves unto itself and its successors and assigns all rights and privileges in and to the use of the Property which are not incompatible with the restrictions, and rights granted herein.

Section 5. **No Public Access and Use.** No right of access or use by the general public to any portion of the Property is conveyed by this instrument.

Section 6. **Notice Requirement.** Weyerhaeuser and its successors and assigns agree to include in any instrument conveying any interest in any portion of the Property, including but not limited to deeds, leases and mortgages a notice which is in substantially the following form:

NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO THE EFFECT OF A RESTRICTIVE COVENANT, DATED _____, RECORDED IN THE PUBLIC LAND RECORDS ON _____, IN BOOK _____, PAGE _____, IN FAVOR OF, AND ENFORCEABLE BY THE STATE OF WASHINGTON.

Within thirty (30) days of the date any instrument conveying a fee title interest is executed, grantor must provide Ecology with a certified true copy of the instrument and, if it has been recorded in the public land records, its recording reference.

Section 7. **Enforcement.** Ecology shall be entitled to enforce the terms of this instrument by resort to specific performance or legal process. All reasonable costs and expenses of Ecology, including but not limited to attorney's fees, incurred in any such enforcement action shall be borne by Weyerhaeuser or its successor in interest to the Property. All remedies available hereunder shall be in addition to any and all remedies at law or in equity, including the MTCA. Enforcement of the terms of this instrument shall be at the discretion of Ecology, and any forbearance, delay or omission to exercise its rights under this instrument in the event of a breach of any term of this instrument shall not be deemed to be a waiver by Ecology of such term or of any subsequent breach of the same or any other term, or of any of the rights of Ecology under this instrument.

Section 8. **Waiver of Certain Defenses.** Weyerhaeuser hereby waives any defense of laches, estoppel or prescription.

Section 9. **Covenants.** Weyerhaeuser hereby covenants to Ecology that Weyerhaeuser is the fee simple owner of the Property.

Section 10. **Notices.** Any notice, demand, request, consent, approval, or communication that either party desires or is required to give the other shall be in writing and shall be served personally or sent by first class mail postage prepaid, addresses as follows:

To Weyerhaeuser:

V.P. Land Management Division
WRE 1-1
Tacoma, WA 98477-2999

To Ecology:

Washington State Department of Ecology
Toxics Cleanup Program
P.O. Box 47775
Olympia, WA 98504-7775

Weyerhaeuser Real Estate Company has caused this Declaration of Restrictive Covenant to be signed in its name.

EXECUTED this 8th day of December, 1997.

WEYERHAEUSER REAL ESTATE COMPANY

By: Thomas B Miller
Thomas B. Miller
Vice President

BK 1428 PG 3404

STATE OF WASHINGTON)
: ss.
County of King)

On this 8th day of December, 1997, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Thomas B. Miller, known to be the Vice President of Weyerhaeuser Real Estate Company, the Corporation that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that they are authorized to execute said instrument.

WITNESS my hand and official seal hereto affixed the day and year written above.

TERRI L. VANCIL NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES DEC 15, 2000

NOTARY PUBLIC in and for the State of Washington. My commission expires:
Terri L. Vancil
Residing at Olalla

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY
By: Mike J. Blum
Name of Person Acknowledging Receipt
Ecology Project Manager - Toxics Cleanup Program
Title
Dated: 12/18/97

Attachments:
Exhibit A - Legal description of property.

9712230865

DuPont Consent Area

EXHIBIT A
LEGAL DESCRIPTION
FOR CONSENT AREA (PARCEL 2)

That portion of the Southeast quarter of Section 22 AND that portion of the South half of Section 23 AND that portion of the North half of Section 26 AND that portion of the Northeast quarter of Section 27, ALL in Township 19 North, Range 1 East, W.M., Pierce County, Washington, being more particularly described as follows:

COMMENCING at the West quarter corner of said Section 26, being a 6" x 6" concrete monument with "X";

THENCE along the West line of said Section, N 01°47'39" E, 2635.01 feet to the Northwest quarter of said Section, being a 6" x 6" concrete monument with "X";

THENCE along the West line of said Section, S 01°47'39" W, 554.70 feet;

THENCE S 88°47'08" E, 65.36 feet to the TRUE POINT OF BEGINNING;

THENCE continuing S 88°47'08" E, 1439.35 feet;

THENCE S 33°00'19" E, 543.91 feet;

THENCE N 87°59'15" E, 833.12 feet to the Westerly margin of the Puget Sound Power and Light Company Easement;

THENCE along said Westerly margin, N 01°40'37" E, and 957.55 feet;

THENCE continuing along said Westerly margin, N 02°06'15" E, 1275.17 feet to an angle point on said easement;

THENCE along the Northerly extension of said Westerly margin, N 02°06'15" E, 298.36 feet to an existing 7 foot high chain link fence with barb wire atop;

THENCE along said fence line, N 86°38'04" W, and 549.37 feet;

THENCE N 00°00'00" W, 78.68 feet;

THENCE S 90°00'00" W, 262.85 feet;

THENCE N 00°00'00" W, 397.09 feet;

THENCE S 90°00'00" W, 970.32 feet;

THENCE N 00°00'00" W, 438.74 feet;

THENCE S 90°00'00" W, 286.79 feet;

THENCE S 00°00'00" E, 226.33 feet;

THENCE S 90°00'00" W, 231.85 feet;

THENCE S 00°00'00" E, 249.16 feet;

THENCE S 89°50'39" W, 1734.93 feet;

THENCE N 00°00'00" W, 258.53 feet;

THENCE S 90°00'00" W, 264.30 feet;

THENCE S 00°00'00" E, 511.38 feet;

THENCE N 90°00'00" E, 261.44 feet;

THENCE S 00°00'00" E, 239.63 feet;

THENCE N 90°00'00" E, 223.81 feet;

THENCE S 00°00'00" E, 252.97 feet;

THENCE N 90°00'00" E, 238.20 feet;

THENCE S 00°00'00" E, 266.87 feet;

THENCE N 90°00'00" E, 300.47 feet;

THENCE S 00°00'00" E, 496.73 feet;

THENCE N 90°00'00" E, 230.46 feet;

THENCE S 00°00'00" E, 224.71 feet;

THENCE N 90°00'00" E, 207.44 feet;

THENCE S 00°00'00" E, 673.76 feet;

THENCE N 90°00'00" E, 134.26 feet to the monumented line of Sequalitchew Creek per that Record of Survey by ESM, Inc. as filed under Recording No. 8907170351, Records of Pierce County, Washington;

THENCE along said monumented line, S 20°43'37" E, 140.33 feet to the TRUE POINT OF BEGINNING.

Containing 205.100 acres (8,934,137 S.F.), more or less.

PIERCE COUNTY, WA
9910290750
10-29-1999 11:39 am
Fee Amt: $17.00

Return Address

Weyerhaeuser Company
P. O. Box 100
DuPont, WA 98327
Attn: Vern Moore

Please print or type information.

Document Title(s) (or transactions contained therein):
1. Declaration of Restrictive Covenant
2.
3.

Grantor(s) (Last name first, then first name and initials)
1. Weyerhaeuser Company
2. Weyerhaeuser Real Estate Company
3.
4. ☐ Additional Names on Page _____ of Document.

Grantee(s) (Last name first, then first name and initials)
1. The Public
2.
3.
4. ☐ Additional Names on Page _____ of Document.

Legal Description (abbreviated: *i.e.*, lot, block, plat or section, township, range)
Portions of Sections 22, 23, 26, and 27, Township 19 North, Range 1 East, W.M. Pierce County, Washington

Full Legal Description on Pages 5-7 of Document.

Reference Number(s) of Documents Assigned or Released:

N/A

☐ Additional Reference Numbers on Page _____ of Document.

Assessor's Property Tax Parcel/Account Number
01-19-22-3002; 01-19-26-2004; 01-19-26-3007; 01-19-27-1001; 01-19-23-3005; 01-19-26-2005; 01-19-22-3001

The Auditor/Recorder will rely on the information provided on this cover sheet. The staff will not read the document to verify the accuracy or completeness of the indexing information provided herein.

9910290750

17

DECLARATION OF RESTRICTIVE COVENANT

This Declaration of Restrictive Covenant is made this 26th day of October, 1999, by Weyerhaeuser Company and by Weyerhaeuser Real Estate Company, the fee title owners of the real property described below (collectively, the "Owners").

1. Property. The collective real property located in DuPont, Washington, legally described on Exhibit A, and commonly referred to as "Parcel One" and "Parcel Two" of the "Former DuPont Works Site," is the subject of remedial action under the Washington Model Toxics Control Act, Chapter 70.105D RCW (the "Property"). Remedial action is currently in process on Parcel One and has been completed on Parcel Two, and is described in the Consent Decree entered in State of Washington v. Weyerhaeuser Co., Inc. and DuPont Co., Inc., Thurston County Cause No. 91-2-01073-1.

2. Restrictions on Use. Parcel Two and, as shown on the map attached as Exhibit B, the Portion of Parcel One north of Sequalitchew Creek, shall be developed and used only for industrial uses. In no event shall any of the Property be developed or used for any of the following activities: residential uses, schools, daycares, or parks, or recreational uses; provided that golf courses and related amenities shall be allowed on Parcel One.

3. Reservation of Rights. The Owners reserve unto themselves, and their successors and assigns, all rights and privileges in and to the use of the Property which are not incompatible with the restrictions and rights granted in this Restrictive Covenant.

4. No Public Access. No right of access or use by the general public to any portion of the Property is conveyed by this instrument.

5. Run with the Land. To the extent that this instrument is construed as a restrictive covenant, it shall run with the land, and shall be binding on the Owners, their successors and assigns, of all or any portion of the Property, without whose consent it cannot be released, modified or amended.

6. Easement in Gross. To the extent that this instrument creates a negative easement, it shall be construed as an easement in gross, for the sole benefit of Weyerhaeuser Company and Weyerhaeuser Real Estate Company, without whose consent it cannot be released, modified or amended.

7. Enforcement. Weyerhaeuser Company, Weyerhaeuser Real Estate Company, and any other fee title holder to all or any portion of the Property, shall have the right to enforce, by any proceedings at law or in equity, all restrictions imposed by the provisions of this Restrictive Covenant. Should Weyerhaeuser Company, Weyerhaeuser Real Estate Company, or any other fee title holder employ legal counsel to enforce this Restrictive Covenant, all costs incurred in such enforcement, including a reasonable fee for legal counsel, shall be paid by the Owner found to be in violation of this document.

8. Severability. Invalidation of any provision or application of a provision of this Restrictive Covenant by any court shall not affect any other provisions or applications.

9. Interpretation. The singular may also include the plural and the masculine may include the feminine, or visa versa, where the context so admits or requires. Captions are included for convenience only.

WEYERHAEUSER COMPANY

By: Robert A. Dowdy
Vice President and General Counsel
(name printed or typed)
Its:
Dated: 10/26/99

WEYERHAEUSER REAL ESTATE COMPANY

By: Thomas B. Miller
Thomas B. Miller
Its: Vice President
Dated: 10/10/99

STATE OF WASHINGTON)
) ss.
County of King)

I certify that I know or have satisfactory evidence that Robert A. Dowdy is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as the Vice President of WEYERHAEUSER COMPANY to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

DATED this 26th day of October, 1999.

KATHLEEN T. DRAHOS NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES SEPT 15, 2002

Kathleen T. Drahos
Kathleen T. Drahos
(Type/Print Name above)
Notary Public in and for the State of Washington, residing at Orting
My appointment expires: Sept. 15th, 2002.

STATE OF WASHINGTON)
) ss.
County of King)

I certify that I know or have satisfactory evidence that THOMAS B. MILLER is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as the VICE PRESIDENT of WEYERHAEUSER REAL ESTATE COMPANY to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

DATED this 10 day of October, 1999.

Terri L. Vancil
(Type/Print Name above)
Notary Public in and for the State of Washington, residing at Olalla.
My appointment expires: 12/15/00.

EXHIBIT A
TO
DECLARATION OF RESTRICTIVE COVENANT

LEGAL DESCRIPTION FOR
CONSENT AREA (PARCEL 1)

That portion of the South half of Section 22 AND that portion of the West half of Section 26 AND that portion of Section 27, ALL in Township 19 North, Range 1 East, W.M., Pierce County, Washington, being more particularly described as follows:

COMMENCING at the West quarter corner of said Section 26, being a 6" x 6" concrete monument with "X";

THENCE along the West line of said Section, N 01°47'39" E, 2635.01 feet to the Northwest corner of said Section, being a 6" x 6" concrete monument with "X";

THENCE along the West line of said Section, S 01°47'39" W, 554.70 feet to the TRUE POINT OF BEGINNING;

THENCE S 88°47'08" E, 1504.71 feet;

THENCE S 33°00'19" E, 901.00 feet;

THENCE S 01°40'37" W, 1140.43 feet;

THENCE S 39°35'03" W, 1290.96 feet to an existing 7 foot high chain link fence with barb wire atop;

THENCE along said fence line, the following bearings and distances:

S 54°01'26" W, 1898.35 feet;

N 82°31'10" W, 1797.29 feet;

N 68°34'59" W, 3235.77 feet;

N 02°55'12" W, 203.54 feet;

N 14°26'10" E, 386.38 feet;

N 16°58'22" E, 557.84 feet;

N 22°03'49" E, 1918.07 feet;

N 30°51'26" E, 610.41 feet;

N 60° 43'57" E, 203.50 feet;

N 45°11'21" E, 1390.65 feet;

N 35°14'28" E, 45.20 feet;

N 12°10'36" E, 20.58 feet;

THENCE N 44°40'54" E, 20.34 feet to a point on the Southerly monumented line of Sequalitchew Creek as shown on that Record of Survey by ESM, Inc. as filed under Recording No. 8907170351, Records of Pierce County, Washington.

THENCE along said monumented line, the following bearings and distances:

N 44°40'54" E, 70.26 feet;

S 53°19'01" E, 95.14 feet;

S 72°27'15" E, 108.17 feet;

S 73°26'19" E, 170.31 feet;

S 09°01'31" E, 75.90 feet;

S 59°28'35" E, 86.92 feet;

N 27°03'38" E, 55.73 feet;

S 56°01'12" E, 77.30 feet;

S 42°37'43" E, 145.44 feet;

S 46°02'34" E, 265.02 feet;

S 55°18'22" E, 186.10 feet;

THENCE leaving said monument line, S 76°12'57" E, 188.49 feet;

THENCE N 52°52'30" E, 75.60 feet;

THENCE N 80°48'55" E, 77.99 feet;

THENCE S 75°01'48" E, 55.61 feet;

THENCE S 81°24'05" E, 39.01 feet;

THENCE S 22°37'33" E, 83.02 feet to said monumented line of Sequalitchew Creek;

THENCE along said monumented line, the following the bearings and distances:

S 61°16'46" E, 243.97 feet;

S 50°59'49" E, 193.72 feet;

S 35°32'26" E, 215.85 feet;

S 26°05'39" E, 165.29 feet;

S 36°52'17" E, 143.38 feet;

S 20°09'56" E, 96.99 feet;

S 15°40'54" E, 191.12 feet;

S 33°57'49" E, 65.28 feet;

S 35°33'50" E, 126.48 feet;

S 44°41'41" E, 147.28 feet;

S 54°34'32" E, 70.01 feet;

THENCE leaving said monumented line and running, S 88°47'08" E, 240.62 feet to the TRUE POINT OF BEGINNING.

Containing 636.183 acres (27,712,128 square feet), more or less.

LEGAL DESCRIPTION FOR
CONSENT AREA (PARCEL 2)

That portion of the Southeast quarter of Section 22 AND that portion of the South half of Section 23 AND that portion of the North half of Section 26 AND that portion of the Northeast quarter of Section 27, ALL in Township 19 North, Range 1 East, W.M., Pierce County, Washington, being more particularly described as follows:

COMMENCING at the West quarter corner of said Section 26, being a 6" x 6" concrete monument with "X";

THENCE along the West line of said Section, N 01°47'39" E, 2635.01 feet to the Northwest quarter of said Section, being a 6" x 6" concrete monument with "X";

THENCE along the West line of said Section, S 01°47'39" W, 554.70 feet;

THENCE S 88°47'08" E, 65.36 feet to the TRUE POINT OF BEGINNING;

THENCE continuing S 88°47'08" E, 1439.35 feet;

THENCE S 33°00'19" E, 543.91 feet;

THENCE N 87°59'15" E, 833.12 feet to the Westerly margin of the Puget Sound Power and Light Company Easement;

THENCE along said Westerly margin, N 01°40'37" E, 957.55 feet;

THENCE continuing along said Westerly margin, N 02°06'15" E, 1275.17 feet to an angle point on said easement;

THENCE along the Northerly extension of said Westerly margin N 02°06'15" E, 298.36 feet to an existing 7 foot high chain link fence with barb wire atop;

THENCE along said fence line, N 86°38'04" W, 549.37 feet;

THENCE N 00°00'00" W, 78.68 feet;

THENCE S 90°00'00" W, 262.85 feet;

THENCE N 00°00'00" W, 397.09 feet;

THENCE S 90°00'00" W, 970.32 feet;

THENCE N 00°00'00" W, 438.74 feet;

THENCE S 90°00'00" W 286.79 feet;

THENCE S 00°00'00" E, 226.33 feet;

THENCE S 90°00'0" W, 231.85 feet;

THENCE S 00°00'00" E. 249.16 feet;

THENCE S 89°50'39" W. 1734.93 feet;

THENCE N 00°00'00" W, 258.53 feet;

THENCE S 90°00'00" W, 264.30 feet;

THENCE S 00°00'00" E, 511.38 feet;

THENCE N 90°00'00" E, 261.44 feet;

THENCE S 00°00'00" E, 239.63 feet;

THENCE N 90°00'00" E, 223.81 feet;

THENCE S 00°00'00" E, 252.97 feet;

THENCE N 90°00'00" E, 238.20 feet;

THENCE S 00°00'00" E, 266.87 feet;

THENCE N 90°00'00" E, 300.47 feet;

THENCE S 00°00'00" E, 496.73 feet;

THENCE N 90°00'00" E, 230.46 feet;

THENCE S 00°00'00" E, 224.71 feet;

THENCE N 90°00'00" E, 207.44 feet;

THENCE S 00°00'00" E, 673.76 feet;

THENCE N 90°00'00" E, 134.26 feet to the monumented line of Sequalitchew Creek per that Record of Survey by ESM, Inc. as filed under Recording No. 8907170351, Records of Pierce County, Washington;

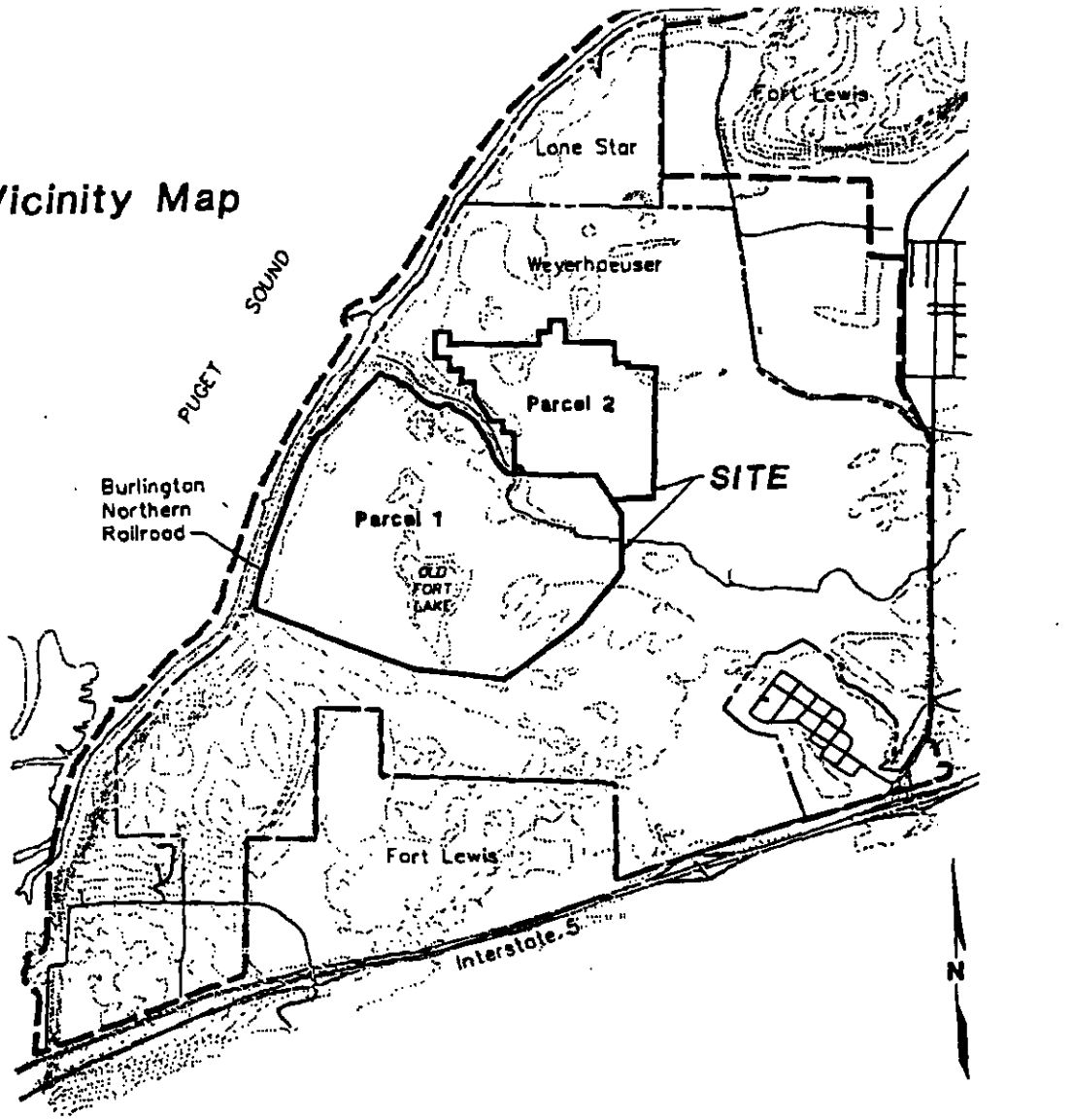
THENCE along said monumented line, S 20°43'37" E, 140.33 feet to the TRUE POINT OF BEGINNING.

Containing 205.100 acres (8,934,137 S.F.), more or less.

See attached Exhibit "B".

EXHIBIT B

Vicinity Map



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

April 26, 2007

Robert N. Martin
Weyerhaeuser Company
Post Office Box 710
DuPont, Washington 98327

Isidoros Zanikos
E.I. du Pont de Nemours and Company
4417 Lancaster Pike
Barley Mill Plaza 19-1236
Wilmington, Delaware 19805

Re: DuPont Works Site – Completion of the Active Cleanup Elements

Dear Mr. Martin and Mr. Zanikos:

The Washington State Department of Ecology (Ecology or we) received your request for a letter to certify completion of cleanup related to soil remediation at the DuPont Works Site (Site) as required under Consent Decree (Pierce County No. 03-2-10484-7) and the July 2003 Cleanup Action Plan. On behalf of Ecology I am pleased to inform you that your Closure Report has been reviewed and accepted. With the exception of groundwater monitoring discussed below, the major elements identified in the Consent Decree and the Cleanup Action Plan for the Site have been completed to Ecology's satisfaction. Those elements include:

- Soil excavation and capping;
- Excavation and off-site disposal of soil and debris;
- Monitoring excavation work for presence of cultural or archeological artifacts; and
- Implementation of various institutional controls (physical controls and legal and administrative mechanisms). These controls help to ensure that current and future citizens and wildlife do not come in contact with residual contamination and that the integrity of the cap/containment system is maintained.

The 2003 Consent Decree and the July 2003 Cleanup Action Plan for the Site identified that groundwater monitoring must continue in selected existing groundwater wells until residual dinitrotoluene (DNT) concentrations drop below drinking water standards for four consecutive monitoring intervals. When that has occurred, Ecology will then be able to issue you a final completion letter.

Due to the fact that lead and arsenic-impacted soil has been consolidated and capped on Site within the golf course placement areas, there will be ongoing reviews by Ecology at least every five years. These reviews are to help ensure that the institutional controls are still in place and effective and that the cleanup decision and actions taken at the Site are still protective of human health and the environment.

Ecology commends the companies for the care and quality of investigative and cleanup work conducted at the Site. Once you have gathered sufficient groundwater quality data to meet the monitoring requirement, Ecology will then be able to issue a final cleanup completion letter. At that time, we will also be able to close out the Consent Decree. he DuPont Works Site has been a model of partnership and cooperation, and the cleanup has resulted in a property that can be productively and safely used for other purposes. I want to personally thank you for your efforts and those of your Team.

If you have any questions, please do not hesitate to call me at (360) 407-6913 or send an e-mail to mblu461@ecy.wa.gov.

Sincerely,

Mike Blum

Mike Blum, Project Manager
Land Cleanup Unit
Land and Aquatic Lands Cleanup Section
Toxics Cleanup Program

cc: John Gross, Weyerhaeuser Company
Joe Jackowski, Weyerhaeuser Company
Pam Meitner, DuPont Company
Polly McNeill, Summit Law Group
Jeff King, Pacific Environmental & Redevelopment Corp.
Dan Alexanian, Ecology
Mike Dunning, Assistant Attorney General

Weyerhaeuser - DuPont Site Specific Remediation Levels

ARSENIC

Proposed Land Use	Potentially Exposed Individual	Remediation Level
Commercial	Adult Landscape Worker	60 ppm
Golf Course	Adult Golf Course Worker	530 ppm
Industrial	Adult Worker	90 ppm
Open Space	Older Child (7-18 years old)	To Be Determined

LEAD

Proposed Land Use	Potentially Exposed Individual	Remediation Level
Commercial	Adult Landscape Worker	2,100 ppm
Golf Course	Adult Golf Course Worker	4,100 ppm
Industrial	Adult Worker	1,000 ppm
Open Space	Older Child (7-18 years old)	1,500 ppm

APPENDIX B

Sampling and Analysis Plan

Contents – Appendix B

B.1. Introduction

The Sampling and Analysis Plan (SAP) includes a Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP) for the cleanup action. The cleanup activities will be conducted as described in the Cleanup Action Plan, in conjunction with the requirements of the Tacoma Smelter Plume (TSP) Model Remedies Guidance (Ecology, 2019), which is considered an additional guidance document for performance of the cleanup action.

B.1.1.Field Sampling Plan (FSP)

This FSP defines the specific requirements for sample collection for the cleanup action.

B.1.1.1. Stockpile Soil Sampling

As described in the Cleanup Action Plan, the excavated soil from the Cleanup Unit will be stockpiled for temporary storage, characterization and reuse. The stockpile sampling will be conducted in accordance with the sampling protocols of the TSP Model Remedies Guidance (Ecology, 2019). Composite soil samples, consisting of discrete grab samples from six locations that are combined into a single sample, will be collected at the frequency expressed in the TSP Model Remedies Guidance for sites with estimated concentrations of arsenic that are less than 100 mg/kg (Ecology, 2019). The number of samples collected will be dependent on the estimated volume of each stockpile. Table A-1 shows the number of composite samples needed.

Table B-1. Number of composite samples per stockpile

Stockpile volume in cubic yds	Number of composites
<500	2
500-999	4
1,000 – 4,999	6
5,000 – 9,999	10
10,000 – 19,999	14
≥20,000	14 + 1 per 5,000 cubic yds

Note: Based on Table 5 from 2019 TSP Model Remedies Guidance for decision unit arsenic concentrations less than 100 mg/kg.

B.1.1.2. Imported Soil Sampling.

It is not anticipated that imported soil will be used in the cleanup or reclamation of the Cleanup Unit. If necessary, any imported soil will be sampled in accordance with the 2019 TSP Model Remedies Guidance to meet the requirements of the Washington State Department of Ecology (Ecology) and the City of DuPont's Hearing Examiner to ensure that the soil used for fill and/or grading meets the MTCA cleanup criteria for unrestricted land use. The City of DuPont's Hearing Examiner required that "any imported soil shall follow the Tacoma Smelter Plume Model Remedies Guidance, Chapter 9: Imported Soil Sampling."

Three composite soil samples, consisting of discrete grab subsamples from three locations that are combined into a single composite sample, will be collected from each stockpile of the imported soil source. The soil will be unsuitable for use in fill and/or grading if concentrations of arsenic exceed 20 mg/kg or concentrations of lead exceed 250 mg/kg.

B.1.1.3. Sample Collection Procedures

This section presents the general procedures for soil sample collection and handling for soil samples that will be submitted to a laboratory for chemical analysis. Additional details can be referenced in the TSP Model Remedies Guidance (Ecology, 2019). Because of the anticipated size of the stockpiles, it may be necessary to use a hand auger, excavator or other equipment to collect representative samples from throughout the stockpile segment. The sample collection method will be determined in the field depending on the size of the stockpiles and any access limitations.

Soil sampling procedures are as follows:

- A clean, stainless steel trowel or spoon will be used to collect each soil sample.
- Soil will be mixed in a stainless-steel mixing bowl, decontaminated between uses; particles greater than about ½ inch will be discarded from the sample.
- Samples will be transferred immediately into a laboratory-supplied sample container.
- The sample container will be labeled with a unique sample identifier as described in the following section.
- Information will be logged on a Chain-of-Custody form, and the sample will be placed into a cooler, maintained at approximately 4 degrees Celsius, and transported to the laboratory under standard chain-of-custody protocols within 48 hours of collection.
- Non-dedicated sampling equipment will be decontaminated between uses.
- Disposable sampling, health and safety supplies, and equipment will be discarded in an appropriate waste dumpster at the Cleanup Unit.

Samples that will be analyzed in the field will be collected with a clean, stainless steel trowel or spoon, mixed in a decontaminated stainless-steel mixing bowl, and collected and analyzed according to the procedures required by the field analysis equipment.

B.1.1.4. Sample Identification

Each soil sample will have a unique identifier as described below:

- **Stockpile characterization samples** will include a prefix of "SP" followed by a sequential identifying number for each stockpile in sequence, the sample number, and the eight-digit date on which the sample was collected. For example, the first sample, from stockpile 3, collected on June 1, 2014, would be identified as SP3-1-06012014.

B.1.1.5. Chemical Analysis

The soil samples will be submitted to an Ecology-accredited laboratory for laboratory analysis of lead and arsenic by US Environmental Protection Agency (EPA) Methods 6010/6020/6200.

Glacier may use portable x-ray fluorescence (XRF) to aid them in the process of amending and mixing a stockpile. However, all samples used to confirm remediated soils meet MTCA cleanup criteria need to be analyzed by an accredited laboratory.

B.1.2.Quality Assurance Project Plan (QAPP)

B.1.2.1. Quality Control Procedures

Field and laboratory quality control (QC) procedures are outlined below.

B.1.2.2. Field Quality Control

Field QC samples will be collected and submitted for analyses to monitor the precision and accuracy associated with field procedures. Field QC samples to be collected and analyzed for the cleanup action consist of field duplicates and equipment rinsate blanks. The definition and sampling requirements for field QC samples are presented below.

Field Duplicates

Field duplicate samples are used to check for sampling and analysis reproducibility; however, the field duplicate sample results include variability introduced during both field sampling and laboratory preparation and analysis, and EPA data validation guidance provides no specific evaluation criteria for field duplicate samples. Advisory evaluation criteria are set forth at 35 percent for relative percent difference (RPD) (if both results are greater than 5 times the reporting limit [RL]) and 2 times the RLs for concentration difference (if either of the result is less than 5 times the RL) between the original and field duplicate results.

Field duplicates will be submitted "blind" to the laboratory as discrete samples (i.e., given unique sample identifiers to keep the duplicate identity unknown to the laboratory), but will be clearly identified in the field log. **Field duplicate samples will be collected at a frequency of 2-percent (1 per 50) of the field samples.**

Equipment Rinsate Blank

Equipment rinsate blanks are collected to determine the potential of cross-contamination introduced by soil sampling equipment that is used between samples. The deionized water used for soil sampling equipment decontamination is washed over the decontaminated sampling equipment and collected into adequate sample containers for analysis of lead and arsenic. The blank is then processed, analyzed, and reported as a regular field sample. **One rinsate blank will be conducted during each major sampling effort.** The rinsate blank sampled will be labeled with a "RB**"** prefix and the date it is collected (e.g., RB-06012014).

B.1.2.3. Laboratory Quality Control

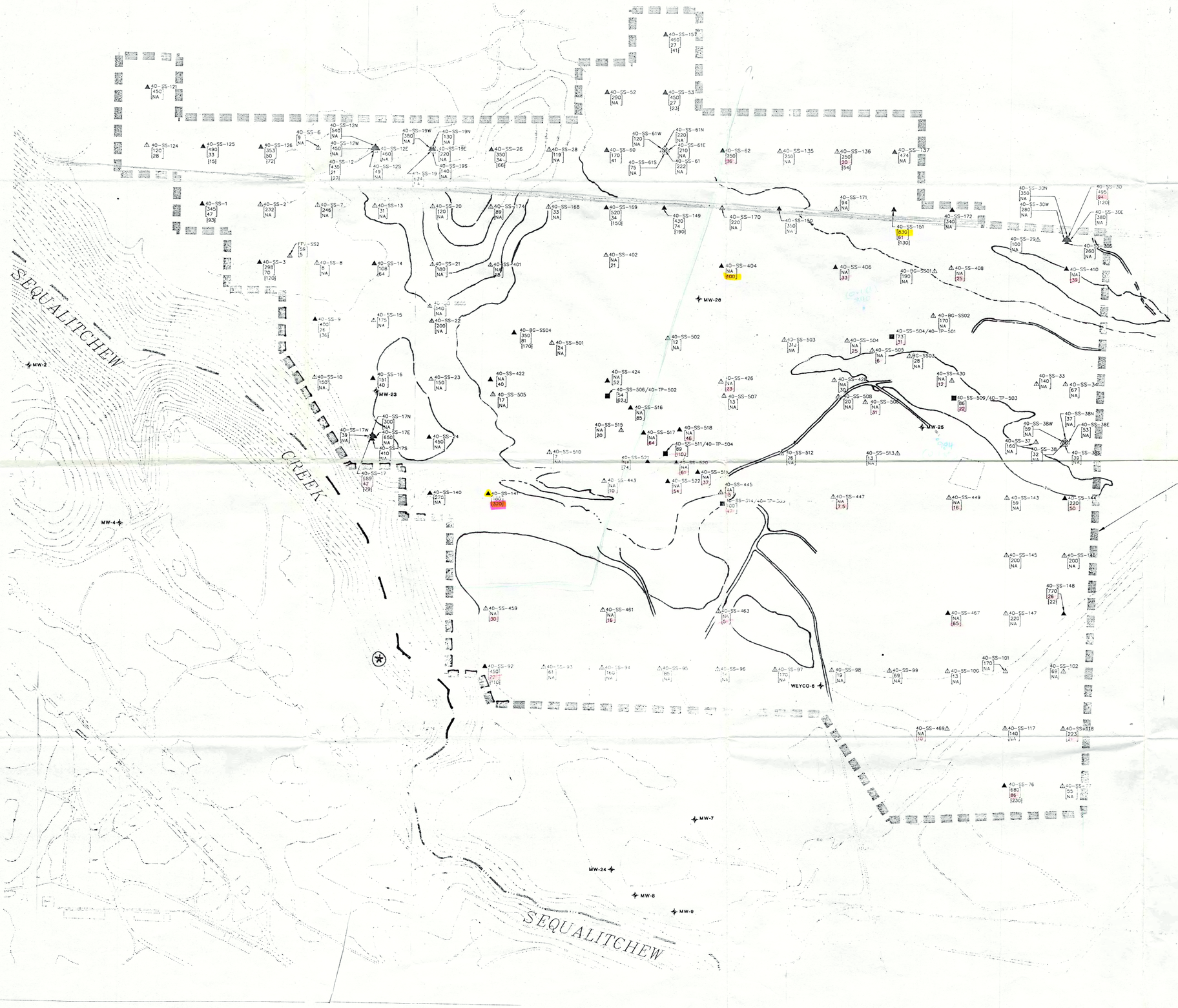
The laboratories' analytical procedures must meet requirements specified in the respective analytical methods or approved laboratory standard operating procedures (SOPs), e.g., instrument performance check, initial calibration, calibration check, blanks, surrogate spikes, internal standards, and/or labeled compound spikes. The laboratory's quality assurance (QA) officers are responsible for ensuring that the laboratory implements the internal QC and QA procedures detailed in the laboratory's Quality Assurance Manual.

APPENDIX C

Supporting Historical Documents

40-Reference Area Lead and Arsenic Concentrations in Surficial Soils (0 to 0.5 Foot)

Black Powder Area



Note: See Figure 2.3-1 for Legend.

[Lead Concentration in mg/kg
Arsenic Concentration in mg/kg]

NA: No Analysis for Specific Constituent

{Lead Concentration in mg/kg from RI Sample at Pre-RI Sampling Location (Refer to Text for Detail)}

40-Reference Area Lead and Arsenic Concentrations in Surficial Soils (0 to 0.5 Foot)

Black Powder Area

N

0 200 400
Scale in Feet

HARTCROWSER
J-3534-07 5/94
Figure 2.16-2

3534054B E/C 5/26/94 1=200 Dupont-2.pcp

Table 2.16-1 – Summary of RI and Interim Source Removal Verification Soil Quality Results for Area 40

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
Glaze Mill													
40-GM-TP-501													
S-1	0-1	310		NE									
40-GM-TP-502													
S-1	0-1	NE		NE									
40-GM-TP-503													
S-2	3-5	ND		NE									
40-GM-TP-504													
S-2	3-5								NE				
S-3	6-7								NE				
40-GM-TP-505													
S-1	0-1	NE		NE	NE								
S-2	3-5	NE		NE									
40-GM-TP-506													
S-1	0-1	NE		NE									
S-2	3-5	NE		NE									
40-GM-TP-507													
S-1	0-1	NE		NE									
S-2	3-5	NE		NE									
40-GM-SS-501	0-0.5	NE		NE									
40-GM-SS-502	0-0.5	NE		NE									
40-GM-SS-503	0-0.5	NE		NE									
40-GM-SS-504	0-0.5	NE		NE									
Interim Source Removal Verification Samples from Glaze Mill													
40-VS-10	0-0.5	NE			NE								
40-VS-11	0-0.5	NE			NE								
40-VS-12	0-0.5	NE			NE								
40-VS-13	0-0.5	NE			NE								
40-VS-14	0-0.5	NE			NE								
40-VS-15	0-0.5	NE			NE								
40-VS-16	0-0.5	NE			NE								
40-VS-17	0-0.5	260			NE								

Table 2.16-1 – Summary of RI and Interim Source Removal Verification Soil Quality Results for Area 40

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
40-VS-18	0-0.5	NE			36								
40-VS-19	0-0.5	NE			41								
40-VS-20	0-0.5	NE			NE								
40-VS-21	0-0.5	NE			NE								
40-VS-22	0-0.5	310			NE								
40-VS-23	0-0.5	NE			36								
40-VS-24	0-0.5	NE			NE								
40-VS-25	0-0.5	NE			NE								
40-VS-26	0-0.5	NE			NE								
40-VS-27	0-0.5	410			100 J								
40-VS-28	0-0.5	ND			NE								
40-VS-29	0-0.5	NE			NE								
Packing House 40-PH-TP-501													
S-1	0-1								NE				
S-2	3-5								NE				
S-3	8-10								NE				
40-PH-TP-502													
S-1	0-1								NE				
S-2	3-5								NE				
40-PH-TP-503													
S-2	3-5								NE				
40-PH-TP-504													
S-2	3-5								NE				
40-PH-TP-505													
S-1	0-1								NE				
S-2	3-5								NE				
40-PH-SS-504	0-0.5	330		NE	NE	NE		ND					
40-PH-SS-505	0-0.5	ND		NE	NE	NE		ND					
40-PH-SS-506	0-0.5	NE		NE	NE	NE		ND					
Interim Source Removal Verification Samples from Packing House													
40-VS-1	0-0.5	NE			38								

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
40-VS-2	0-0.5	430			40								
40-VS-3	0-0.5	NE			NE								
40-VS-4	0-0.5	NE			NE								
40-VS-5	0-0.5	NE			NE								
40-VS-6	0-0.5	NE			35								
40-VS-7	0-0.5	800			NE								
40-VS-8	0-0.5	NE			NE								
40-VS-9	0-0.5	740			NE								
Wheel Mill 1 40-WM1-TP-501													
S-1	0-1								NE				
S-2	3-6								NE				
S-3	8-10								NE				
40-WM1-TP-502													
S-1	0-1	NE		NE	NE	NE	NE						
S-2	3-5	ND		NE									
40-WM1-TP-503													
S-1	0-1	NE		NE	NE	NE	NE						
S-2	3-5	ND		NE									
40-WM1-TP-504													
S-1	0-1	ND		NE									
S-2	3-5	ND		NE									
40-WM1-TP-505													
S-1	0-1	NE		NE	NE	NE	NE						
S-2	3-5	ND		NE									
Wheel Mill 2 40-WM2-TP-501													
S-2	3-6								NE				
S-3	8-10								NE				
40-WM2-TP-502													
S-1	0-1	ND		NE									
S-2	3-5	ND		NE									

Table 2.16-1 - Summary of RI and Interim Source Removal Verification Soil Quality Results for Area 40

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
40-WM2-TP-503													
S-1	0-1	NE		NE									
S-2	3-5	ND		NE									
40-WM2-TP-504													
S-1	0-1	NE		NE									
S-2	3-5	ND		NE									
40-WM2-TP-505													
S-1	0-1	NE		NE									
S-2	3-5	ND		NE									
40-WM2-TP-506													
S-1	0-1	NE		NE									
S-2	3-5	ND		NE									
40-WM2-TP-507													
S-1	0-1	NE		NE									
S-2	3-5	ND		NE									
40-WM2-TP-508													
S-1	1-2	NE											
40-WM2-SS-501	0-0.5	560		NE									
Interim Source Removal Verifications Samples from Wheel Mill 2													
40-VS-54	0-0.5	NE			33 J								
40-VS-55	0-0.5	NE			NE								
40-VS-56	0-0.5	NE			NE								
40-VS-57	0-0.5	NE			NE								
40-VS-58	0-0.5	NE			NE								
40-VS-59	0-0.5	NE			NE								
40-VS-60	0-0.5	NE			NE								
40-VS-61	0-0.5	NE			36								

Table 2.16-1 - Summary of RI and Interim Source Removal Verification Soil Quality Results for Area 40

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
Wheel Mill 3													
40-WM3-TP-501													
S-1	0-1								NE				
S-2	3-6								NE				
S-3	8-10								NE				
40-WM3-TP-501A (Abandoned at 3 feet due to concrete slab; no samples collected.)													
40-WM3-TP-502													
S-1	0-1	NE		NE	NE	NE	NE						
S-2	3-5	NE		NE									
40-WM3-TP-503 (First attempt unsuccessful due to concrete slab at 3 feet; no samples collected.)													
40-WM3-TP-503													
S-1	0-1	NE		NE									
S-2	3-5	NE		NE									
40-WM3-TP-504													
S-1	0-1	NE		NE	NE	NE	NE						
S-2	3-5	NE		NE									
40-WM3-TP-505													
S-1	0-1	NE		NE	NE	NE	NE						
S-2	3-5	NE		NE									
Wheel Mill 4													
40-WM4-TP-501													
S-1	0-1								NE				
S-2	3-6								NE				
S-3	8-10								NE				
40-WM4-TP-502													
S-1	0-1	NE		NE	NE	NE	NE						
S-2	3-5	NE		NE									
40-WM4-TP-503													
S-1	0-1	NE		NE	NE	NE	NE						
S-2	3-5	NE		NE									

Table 2.16-1 – Summary of RI and Interim Source Removal Verification Soil Quality Results for Area 40

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
40-WM4-TP-504													
S-1	0-1	NE		NE									
S-2	3-5	NE		NE									
40-WM4-TP-505													
S-1	0-1			NE	NE	NE	NE		NE				
S-2	3-5								NE				
40-WM4-OBTP-501 (Observational test pit; no samples collected.)													
Press House													
40-PR-TP-501													
S-1	0-1	NE		NE									
40-PR-TP-502													
S-1	0-1	NE		NE									
40-PR-TP-503													
S-2	1-2	ND		NE									
S-3	2-3	ND											
S-4	3-5								NE				
S-5	8-10								NE				
40-PR-TP-504													
S-1	0-1	ND		NE									
40-PR-TP-505													
S-1	0-1	ND		NE									
Interim Source Removal Verification Samples from Press House													
40-VS-47	0-0.5	410			NE								
40-VS-48	0-0.5	770			NE								
40-VS-49	0-0.5	260			NE								
40-VS-50	0-0.5	NE			NE								
40-VS-51	0-0.5	470			NE								
40-VS-53	0-0.5	820			39								
Crusher													
40-CR-TP-501													
S-1	0-1	ND		NE									

Table 2.16-1 – Summary of RI and Interim Source Removal Verification Soil Quality Results for Area 40

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
40-CR-TP-502													
S-1	0-1	NE		NE									
40-CR-TP-503													
S-1	0-1	ND		NE									
40-CR-TP-504													
S-1	0-1	ND		NE									
40-CR-TP-505													
S-1	0-1	NE		NE									
S-2	1-2	ND											
40-CR-TP-506													
S-1	0-1								NE				
S-4	3-5								NE				
S-5	8-10								NE				
Interim Source Removal Verification Samples from Crusher													
40-VS-76	0-0.5	680			120								
40-VS-77	0-0.5	700			190								
40-VS-78	0-0.5	300			40								
40-VS-79	0-0.5	NE			NE								
40-VS-81	0-0.5	NE			NE								
40-VS-82	0-0.5	NE			NE								
40-VS-83	0-0.5	NE			NE								
40-VS-84	0-0.5	NE			86								
40-VS-85	0-0.5	NE			NE								
40-VS-86	0-0.5	NE			46 J								
40-VS-87	0-0.5	NE			NE								
Milling House													
40-MH-TP-501													
S-1	0-1	ND		NE									
40-MH-TP-502													
S-1	0-1	450		NE									
40-MH-TP-503													
S-1	0-1	NE		NE									

Table 2.16-1 – Summary of RI and Interim Source Removal Verification Soil Quality Results for Area 40

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
40-MH-TP-504													
S-2	1-1.5	ND											
S-6	3-5								NE				
S-7	8-10								NE				
40-MH-TP-505													
S-2	1-1.5	390											
S-3	1.5-2												
S-4	2-2.5												
S-5	2.5-3												
S-6	2-5								NE				
S-7	8-10								NE				
40-MH-TP-506													
S-1	0-1	NE		NE									
40-MH-TP-507													
S-1	0-1	NE		NE									
40-MH-TP-508													
S-1	0-1	NE		NE									
40-MH-SS-501	0-0.5	NE		NE									
40-MH-SS-502	0-0.5	NE		NE									
Interim Source Removal Verification Samples from Milling House													
40-VS-30	0-0.5	NE			NE								
40-VS-31	0-0.5	390			68 J								
40-VS-32	0-0.5	NE			NE								
40-VS-33	0-0.5	NE			NE								
40-VS-34	0-0.5	630			50								
40-VS-35	0-0.5	NE			56								
40-VS-36	0-0.5	600			NE								
40-VS-37	0-0.5	NE			NE								
40-VS-38	0-0.5	NE			44								
40-VS-39	0-0.5	NE			NE								
40-VS-40	0-0.5	NE			NE								
40-VS-41	0-0.5	NE			36								

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
40-VS-42	0-0.5	NE			NE								
40-VS-44	0-0.5	NE			44 J								
40-VS-45	0-0.5	ND			NE								
40-VS-46	0-0.5	430			NE								
Pulverizer 40-PU-TP-501													
S-2	1-1.5	340		NE	NE			NE					
S-3	1.5-2	NE		NE									
S-4	2-2.5	NE											
S-5	2.5-3	NE											
S-6	3-5								NE				
S-7	8-10								NE				
40-PU-TP-502													
S-1	0-1	NE		NE									
40-PU-TP-503													
S-1	0-1	NE		NE									
40-PU-TP-504													
S-1	0-1	ND		NE									
40-PU-TP-505													
S-1	0-1	NE		NE									
40-PU-TP-506													
S-1	0-1	NE		NE									
40-PU-TP-507													
S-1	1-2	ND											
40-PU-TP-508													
S-1	1-2	NE			NE								
S-2	2-3				NE								
40-PU-SS-503	0-0.5												ND

Table 2.16-1 - Summary of RI and Interim Source Removal Verification Soil Quality Results for Area 40

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
Interim Source Removal Verification Samples from Pulverizer													
40-VS-62	0-0.5	NE			NE								
40-VS-63	0-0.5	NE			NE								
40-VS-64	0-0.5	NE			110								
40-VS-65	0-0.5	ND			NE								
40-VS-66	0-0.5	ND			NE								
40-VS-67	0-0.5	760			NE								
40-VS-68	0-0.5	880			NE								
40-VS-70	0-0.5	260			NE								
40-VS-71	0-0.5	270			NE								
40-VS-72	0-0.5	NE			57								
40-VS-73	0-0.5	NE			NE								
40-VS-74	0-0.5	280			90								
40-VS-75	0-0.5	NE			NE								
40 Reference Area													
40-TP-501-S1	1-2				NE								
40-TP-502-S1	1-2				NE								
40-TP-503-S1	1-2				NE								
40-TP-504-S1	1-2				NE								
40-TP-505-S1	1-2				NE								
40-TP-600													
S-1	0-1											NE	ND
S-2	3-6											NE	ND
S-3	8-10											ND	ND
40-SS-14	0-0.5				64								
40-SS-16	0-0.5				40								
40-SS-33	0-0.5				NE								
40-SS-60	0-0.5				41								
40-SS-62	0-0.5				36								
40-SS-118	0-0.5				NE								
40-SS-124	0-0.5				NE								
40-SS-141	0-0.5				320								

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
40-SS-144	0-0.5				50								
40-SS-401	0-0.5				NE								
40-SS-402	0-0.5				NE								
40-SS-404	0-0.5				100								
40-SS-406	0-0.5				33								
40-SS-408	0-0.5				NE								
40-SS-410	0-0.5				39								
40-SS-422	0-0.5				40								
40-SS-424	0-0.5				52								
40-SS-426	0-0.5				NE								
40-SS-428	0-0.5				NE								
40-SS-430	0-0.5				NE								
40-SS-443	0-0.5				NE								
40-SS-445	0-0.5				NE								
40-SS-447	0-0.5				NE								
40-SS-449	0-0.5				NE								
40-SS-459	0-0.5				NE								
40-SS-461	0-0.5				NE								
40-SS-463	0-0.5				NE								
40-SS-467	0-0.5				65								
40-SS-469	0-0.5				NE								
40-SS-501	0-0.5	NE											
40-SS-502	0-0.5	NE											
40-SS-503	0-0.5	NE											
40-SS-504	0-0.5								NE				
40-SS-505	0-0.5	NE											
40-SS-506	0-0.5								As:62 J				
40-SS-507	0-0.5	NE											
40-SS-508	0-0.5	NE											
40-SS-509	0-0.5								NE				
40-SS-510	0-0.5	NE											
40-SS-511	0-0.5								As:110 J				

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
40-SS-512	0-0.5	NE											
40-SS-513	0-0.5	NE											
40-SS-514	0-0.5								As:47				
40-SS-515	0-0.5				NE								
40-SS-516	0-0.5				85								
40-SS-517	0-0.5				64								
40-SS-518	0-0.5				46								
40-SS-519	0-0.5				37								
40-SS-520	0-0.5				61								
40-SS-521	0-0.5				74								
40-SS-522	0-0.5				54								
40-SS-523	0-0.5				150								
40-SS-524	0-0.5				37								
RI Re-sampling at Pre-RI Locations													
40-SS-1-PL	0-0.5	NE			47								
40-SS-3-PL	0-0.5	NE			70J								
40-SS-9-PL	0-0.5	NE			NE								
40-SS-12-PL	0-0.5	NE			NE								
40-SS-17-PL	0-0.5	NE			47								
40-SS-26-PL	0-0.5	NE			34								
40-SS-30-PL	0-0.5	NE			94J								
40-SS-53-PL	0-0.5	NE			NE								
40-SS-76-PL	0-0.5	NE			86								
40-SS-92-PL	0-0.5	NE			NE								
40-SS-125-PL	0-0.5	NE			33								
40-SS-126-PL	0-0.5	NE			50								
40-SS-136-PL	0-0.5	NE			NE								
40-SS-148-PL	0-0.5	NE			NE								
40-SS-149-PL	0-0.5	NE			74J								

Area-Type-Exploration No. Sample No.	Sample Depth Interval in Feet	Concentration in mg/kg											
		Total Lead	TCLP Lead	Total Cd	Total As	Total Hg	Total Cu	Total Sb	14 Total Metals	TPH	PAHs	NAX	MMAN
40-SS-151-PL	0-0.5	NE			61								
40-SS-157-PL	0-0.5	NE			NE								
40-SS-169-PL	0-0.5	NE			34								
40-BG-SS04-PL	0-0.5	NE			81J								
Pre-RI Sample Resubmissions													
40-SS-9	0-0.5			NE									
40-SS-12N	0-0.5			NE									
40-SS-17	0-0.5			NE									
40-SS-19	0-0.5			NE									
40-SS-24	0-0.5			NE									
40-SS-30	0-0.5			NE									
40-SS-34	0-0.5			NE									
40-SS-76	0-0.5			NE									
40-SS-92	0-0.5			NE									
40-SS-96	0-0.5			NE									
40-SS-121	0-0.5			NE									
40-SS-148	0-0.5			NE									
40-SS-151	0-0.5			NE									
40-SS-157	0-0.5			NE									
40-SS-169	0-0.5			NE									

Note: Refer to Table 2.3-1 for legend.

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Table 2.16-2 - Statistical Screening Evaluation of Soil Quality in Area 40

	Detection Frequency	Maximum Detection	Arithmetic Mean	Arithmetic Std. Dev.	Nat. Log Mean	Nat. Log Std. Dev.	Statistical Distribution	95 % UCL on Mean	Risk Assessment Evaluation
Black Powder Production Line									
Metal (Total) in mg/kg									
Arsenic	171/171	190	19	28	2.20	1.20	LN	23	No
Lead	262/319	984	132	203	3.56	1.86	LN	270	Yes
40-Reference Area									
Metal (Total) in mg/kg									
Arsenic	76/76	320	43	44	3.32	1.07	LN	66	Yes
Lead	145/145	830	191	177	4.73	1.15	LN	280	Yes

Note: Refer to Table 2.4-2 for legend.

3534070694-rid\area40.wk1

NORTH SEQUALITCHEW CREEK PROJECT IMPACT AREA

WETLAND DELINEATION REPORT

Prepared for

Glacier Northwest

Prepared by

Anchor Environmental, L.L.C.
1423 3rd Avenue, Suite 300
Seattle, Washington 98101

October 30, 2007

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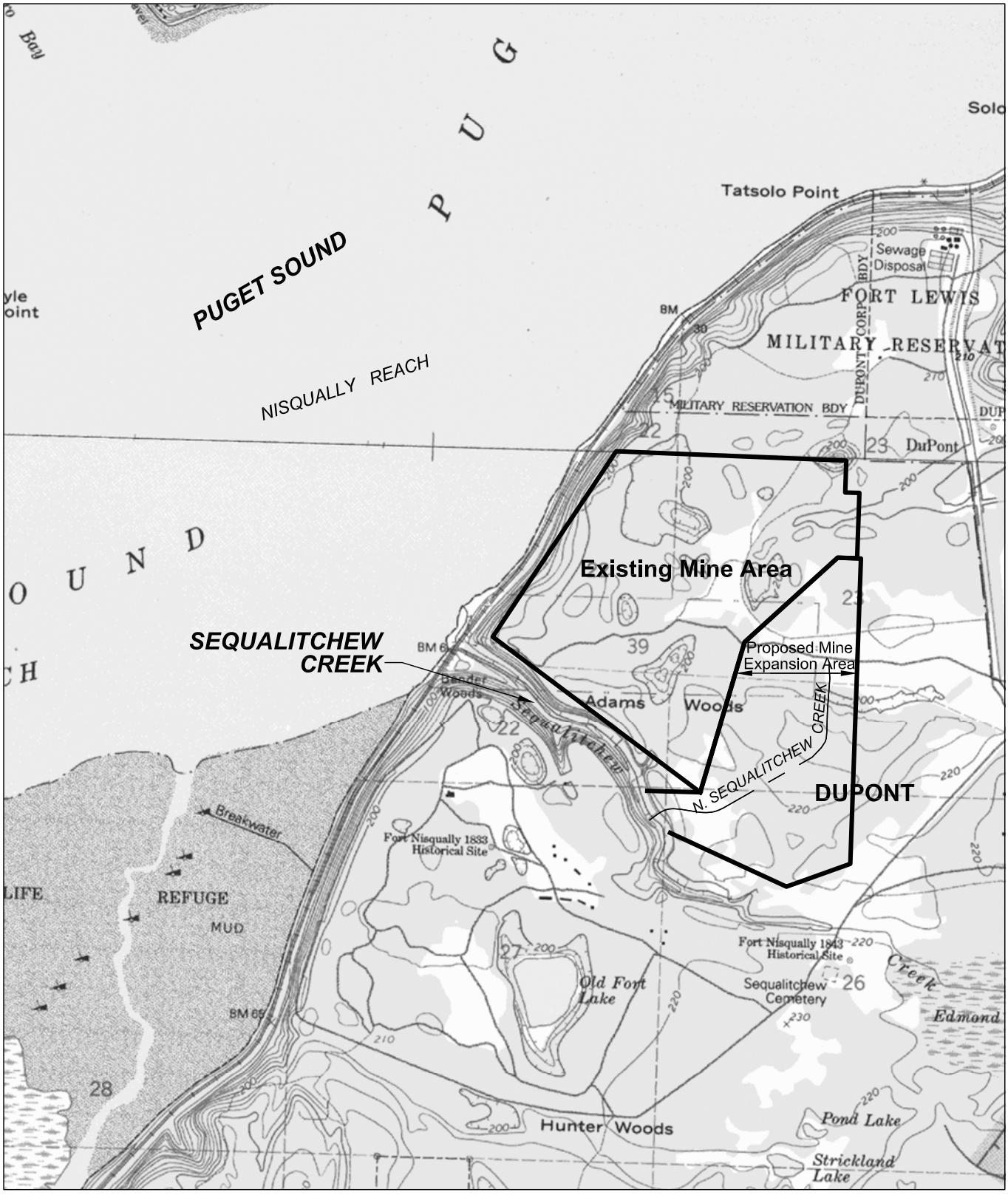
1 INTRODUCTION

The purpose of the investigation was to identify, evaluate, and delineate wetland systems expected to be disturbed by the Glacier Northwest (Glacier) proposed Pioneer Aggregates Mine expansion and associated creation of North Sequalitchew Creek in DuPont, Washington. Figure 1 shows the vicinity and location of the existing mine and proposed expansion area, collectively referred to as the study area for this report. Anchor Environmental, L.L.C. (Anchor) wetland scientists conducted a wetland delineation to flag the boundaries of all wetlands occurring in the study area. Within the study area, two wetlands were identified: the Kettle Wetland and the Seep Wetland. These wetlands are protected by the City of DuPont (DuPont) Administrative Code as Sensitive Areas (DuPont 2007a). This report provides a brief description of dominant vegetation, soil characteristic, and hydrology indicators for each wetland and the wetland type (Cowardin et al. 1979) and wetland category based on current Washington Department of Ecology (Ecology) (Ecology 2004) and DuPont criteria (DuPont 2007b).

The remaining sections of this report describe the methods used in the wetland field investigation and Anchor's findings. Documentation for information collected as the basis of those findings is presented in the accompanying attachments.



Note: Base map prepared from Navigator Pro USGS 7.5 minute quadrangle map(s) Nisqually and McNeil Island, Washington.

Sep 20, 2007 2:52pm cdavidson K:\Jobs\070217-Sequalitchew\070217-01\07021701-004.dwg FIG 1 WDR

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1
Project Vicinity and Location
North Sequalitchew Creek

2 METHODS

On July 31 and August 9, 2007, Anchor staff performed a wetland delineation, wetland rating, and functional analysis of two wetlands within the study area, located in DuPont, Washington (Township 19 North, Range 1 East, Sections 22, 23, 26, and 27). The first wetland was the Kettle Wetland located near the center of the existing mining area. The second wetland consisted of a narrow Seep Wetland located above the abandoned railroad grade above Sequalitchew Creek. This section presents methods used to survey, delineate, rate, and analyze functions of the two wetlands described above.

The wetland delineation was conducted according to the methods defined in the U.S. Army Corps of Engineers (Corps) Wetland Delineation Manual (Environmental Laboratory 1987) and the Washington State Wetland Identification and Delineation Manual (Ecology 1997). Soil colors were classified by their numerical description as identified on a Munsell Soil Color Chart (Munsell 1994). The Corps (Environmental Laboratory 1987), the state Shoreline Management Act (SMA), the state Growth Management Act (GMA), and DuPont Land Use Code (DuPont 2007b) all define wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The method for delineating wetlands is based on the presence of three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. Hydrophytic vegetation is "the macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present." Hydric soils are "formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." Wetland hydrology "encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface for a sufficient duration during the growing season" (Ecology 1997). Data collection methods for each of these parameters are described below.

Data plots were sampled for each wetland in the study area, at least one data plot within the wetland and one outside the wetland. Vegetation, soils, and hydrology information were

collected at each of the plots and recorded on field data sheets (Attachment 1). Wetland boundaries were determined based upon plot data and visual observation of the site. The wetland boundary and sample plot locations were flagged for survey by ESM Consulting Engineers, L.L.C. (ESM). Wetland areas were identified on the project base map.

2.1 Vegetation Characterization

Plant species occurring in each plot were recorded on field data sheets, one data sheet per plot. A summary of plant species observed in the vicinity of each wetland is provided in Attachment 2. Percent cover by strata was estimated in the field for each plant species in the plot, and dominant species were determined. A plant indicator status, designated by the U.S. Fish and Wildlife Service (USFWS) (Reed 1988; 1993), was assigned to each species and a determination was made as to whether the vegetation in the plot was hydrophytic. Table 1 shows the wetland indicator status categories. To meet the hydrophytic parameter, more than 50 percent of the dominant species must have an indicator of obligate wetland (OBL), facultative wetland (FACW), or facultative (FAC or FAC+).

Table 1
Wetland Plant Indicator Definitions

Indicator Status	Description
Obligate wetland (OBL)	Occur almost always in wetlands (estimated probability greater than 99%) under natural conditions
Facultative wetland (FACW)	Usually occur in wetlands (estimated probability 67% to 99%), but occasionally found in non-wetlands
Facultative (FAC)	Equally likely to occur in wetlands or non-wetlands (estimated probability 34% to 66%)
Facultative upland (FACU)	Usually occur in non-wetlands (estimated probability 67% to 99%), but occasionally found in wetlands
Obligate upland (UPL)	Occur almost always in non-wetlands (estimated probability greater than 99%) under natural conditions

Wetland community types have been determined for all wetlands in the study area based on the classification system developed by Cowardin et al. (1979). The community types found during this study are listed below:

- Palustrine emergent (PEM): these wetlands have erect, rooted, herbaceous vegetation present for most of the growing season in most years
- Palustrine scrub-shrub (PSS): these wetlands have at least 30 percent cover of woody vegetation that is less than 20 feet high

2.2 Soils Characterization

Soils were sampled in each plot and evaluated for hydric indicators. Soil pits were dug to a depth of 18 inches or greater. Hydric soil indicators include low soil matrix chroma, gleying, and redoximorphic features (such as mottles). Mottles are spots of contrasting color occurring within the soil matrix (the predominant soil color). Gleyed soils are predominantly bluish, greenish, or grayish in color. Soils having a chroma of 2 (with mottles) or less (with or without mottles) are positive indicators of hydric soils (Environmental Laboratory 1987).

2.3 Hydrology Characterization

Wetland hydrology was evaluated at each plot to determine whether it "encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface for a sufficient duration during the growing season" (Ecology 1997). The mesic growing season in western Washington is generally March through October. Field observations of saturation and inundation, and other indicators of wetland hydrology, such as water stained leaves and drainage patterns in wetlands, were recorded. Best professional judgment was used to estimate any differences between observed hydrologic conditions and those conditions that would be typical of the early growing season (March and April).

2.4 Other Data Sources

Reviews of existing information were conducted to identify potential wetlands or site characteristics indicative of wetlands on the site. The following sources of information were reviewed to support field observations:

- *USFWS Wetlands Mapper for National Wetlands Inventory [NWI] Map Information* (USFWS 2007)
- *Soil Survey of Pierce County, Washington* (USDA 1979)
- *Natural Resource Conservation Service (NRCS) Soil Series Mapping* (USDA 2007)
- *Hydric Soil List for Pierce County, Washington* (USDA 2001)
- Washington Department of Fish and Wildlife (WDFW) PHS maps (WDFW 2003)
- *Final Supplemental Environmental Impact Statement, Glacier Northwest DuPont Mining Area Expansion and North Sequalitchew Creek Project* (DuPont 2007c)

2.5 Wetland Ratings

Wetland ratings were determined using the most current version of Ecology guidance in *Washington State Wetland Rating System for Western Washington: Revised* (Ecology 2004) and *Wetland Rating Form – Western Washington, Version 2* (Ecology 2006) and according to DuPont Sensitive Area Maps (see Section 3.7.2).

2.6 Wetland Functions Assessment

The functional values of each wetland were rated according to the *Washington State Wetland Rating System for Western Washington: Revised* (Ecology 2004) and *Wetland Rating Form – Western Washington, Version 2* (Ecology 2006). The Kettle Wetland was also evaluated using the *Washington State Methods for Assessing Wetland Functions in Riverine and Depressional Wetlands in the Lowlands of Western Washington* (Ecology 1999a, 1999b). A quantitative functional assessment methodology for seep wetlands has not been established for the method described above; therefore, functions in the Seep Wetland were only evaluated using Ecology's rating system (Ecology 2004).

Using Ecology's Rating system, both wetlands were rated based on a point system where points are awarded to three functional value categories: water quality, hydrologic, and wildlife habitat. To determine an accurate assessment of a wetland's functional values, function scores were calculated based on entire wetland systems, when applicable, not just the delineated portion of wetlands within the study area. Detailed scoring, based on Ecology wetland rating forms, is provided in Attachment 3.

The Kettle Wetland was evaluated using the quantitative *Washington State Methods for Assessing Wetland Functions in Riverine and Depressional Wetlands in the Lowlands of Western Washington* (Ecology 1999a, 1999b). This method ranks wetland functions based on specific on-site observations relative to reference wetlands that perform these functions at optimal levels. Summary spreadsheets using this method for the Kettle Wetland are provided in Attachment 4.

3 DESCRIPTION OF THE STUDY AREA

The study area consists of a gently rolling to level area at approximately 200 feet above mean sea level (MSL) and steep slopes along the Nisqually Reach of Puget Sound (western property boundary) and Sequalitchew Creek (southern property boundary). Small glacial kettles (topographic closed depressions associated with melting of glacial ice remnants during the most recent glacial retreat) are present nearing the vicinity of the site, including the Kettle Wetland delineated in this report.

The bluffs along the western site boundary rise from Puget Sound to an elevation of about 175 feet MSL. The steepness of slopes along the bluff ranges from approximately 30 to 65 percent. The ravine that includes Sequalitchew Creek is located south and southwest of the expansion area. The majority of this ravine forms the southern boundary of the existing mine. The ravine deepens as it approaches Puget Sound to a maximum depth of 175 feet below the plateau elevation. Slopes along the northern side of the Sequalitchew Creek ravine range from approximately 30 to 75 percent. A narrow-gauge railroad, associated with the former E.I. DuPont de Nemours Company Munitions facility (DuPont Works), was constructed on a bench cut in the northern slope of the ravine. The Seep Wetland delineated in this report is located along this bench cut. The Burlington Northern Railroad right-of-way extends along the shoreline between the property and Puget Sound.

3.1 Plant Communities

The NWI Interactive Mapper Tool (USFWS 2007) and Pierce County Critical Areas Map (Pierce County 2007) identify the Kettle Wetland within the project area. The brackish marsh is also shown on NWI maps at the mouth of Sequalitchew Creek. Wetland vegetation community types delineated in the field include PEM and PSS systems. Sample plot vegetation is described in Section 3.6 and is presented in the field data forms in Attachment 1. Plant species observed in upland and wetland communities are presented in Attachment 2.

3.1.1 Kettle Wetland

Vegetation in the Kettle Wetland contains PEM and PSS systems. Previous studies also identified a Palustrine aquatic bed (PAB) system within the Kettle Wetland; however, PAB systems are characterized by a plant community that grows principally on or below

the surface of the water for most of the growing season in most years. PAB is not present because few floating aquatic plants are present in the wetland, and the community appears to grow above the water's surface (as emergent plants) for the majority of the growing season. Within the Kettle Wetland, the emergent communities consist of common mare's tail (*Hippuris vulgaris*), creeping spike rush (*Eleocharis palustris*), giant bur-reed (*Sparganium eurycarpum*), water parsnip (*Sium suave*), reed canarygrass (*Phalaris arundinacea*), water ladysthumb (*Polygonum amphibium*), mild waterpepper (*Polygonum hydropiperoides*), skunk cabbage (*Lysichiton americanus*), inflated sedge (*Carex vesicaria*), and northern bugleweed (*Lycopus uniflorus*). Aquatic species observed include pondweed (*Potamogeton* sp.) and lesser duckweed (*Lemna minor*). Along the wetland boundary, the scrub-shrub community consists of Pacific willow (*Salix lasiandra*), Scouler's willow (*Salix scouleriana*), sitka willow (*Salix sitchensis*), red-osier dogwood (*Cornus sericea*), and hardhack (*Spiraea douglasii*). Other vegetation along the wetland boundary consists of stinging nettle (*Urtica dioica*), blue elderberry (*Sambucus caerulea*), beaked hazelnut (*Corylus cornuta*), and Henderson sedge (*Carex hendersonii*).

Upland vegetation in the vicinity of the Kettle Wetland includes tree, shrub, grass, and herbaceous species. Dominant tree species in the upland areas around the Kettle Wetland include big-leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), black cottonwood (*Populus balsamifera*), western red cedar (*Thuja plicata*), bitter cherry (*Prunus emarginata*), Douglas hawthorne (*Crataegus douglasii*), blue elderberry, and Pacific madrone (*Arbutus menziesii*). Dominant shrub species around the Kettle Wetland include trailing blackberry (*Rubus ursinus*), salal (*Gaultheria shallon*), snowberry (*Symphoricarpos albus*), Scot's broom (*Cytisus scoparius*), Oregon grape (*Mahonia nervosa*), bald-hip rose (*Rosa gymnocarpa*), oceanspray (*Holodiscus discolor*), sword fern (*Polystichum munitum*), saskatoon (*Amelanchier alnifolia*), red huckleberry (*Vaccinium parvifolium*), and bracken fern (*Pteridium aquilinum*). Herbaceous species include velvet grass (*Holcus lanatus*), western wild-rye (*Elymus glaucus*), colonial bent-grass (*Agrostis capillaries*). Vine species include manroot (*Marah oreganus*).

3.1.2 Seep Wetland

Vegetation in the Seep Wetland is characterized as PEM. Within the wetland, vegetation consists of purple-leaved willow-herb (*Epilobium ciliatum*), lady fern (*Athyrium filix-femina*), soft rush (*Juncus effusus*), young salmonberry (*Rubus spectabilis*), large-leaf avens (*Geum macrophyllum*), scouring rush (*Equisetum hyemale*), and giant horsetail (*Equisetum telmateia*).

Significant areas within the Seep Wetland were unvegetated, potentially as a result of cleanup activities conducted along Sequalitchew Creek Road in recent years. Some of these areas appear to be difficult for rooted plants to establish, and occasionally contain only mosses along the soil surface.

Upland vegetation in the vicinity of the Seep Wetland includes a canopy of red alder, big-leaf maple, Douglas fir (*Pseudotsuga menziesii*), and western red cedar. Shrubs include vine maple (*Acer circinatum*), cascara (*Rhamnus purshiana*), sword fern, and lady fern. Herbaceous species include wild lily-of-the-valley (*Maianthemum dilatatum*), scouring rush, Siberian miner's lettuce (*Claytonia sibirica*), and Cooley's hedge-nettle (*Stachys cooleyae*).

3.2 Soils

The soils in the study area consist of various geologic units deposited before, during, and after the Vashon glaciation of the Puget Sound Lowland. The youngest deposits include the Steilacoom Gravel, sometimes locally referred to as the DuPont Delta. These gravels occur primarily to the west of the proposed project in the area of the current mining operation where they are hundreds of feet thick and unsaturated to near sea level. In the proposed expansion area, these outwash deposits occur as a veneer over a sequence of Vashon Drift, which is primarily comprised of sand and gravel, but has been regionally characterized as a sequence of recessional outwash, till, and advance outwash. The Vashon Drift includes the shallow-most aquifer in the project study area.

The Vashon Drift is underlain by pre-Vashon, non-glacial deposits, referred to as Olympia Beds (or the Kitsap Formation in older studies). These deposits are dense, glacially overridden, and predominantly fine-grained, silty sands and sandy silts. These non-glacial

sediments (as evidenced by organics and wood fragments) were deposited in lowland river, floodplain, lake, and bog environments similar to those found in the larger river valleys in the modern Puget Lowland. These deposits mark the bottom of the Vashon aquifer and the bottom of the sand and gravel being considered for mining.

The soils of the study area have developed under the influence of a moist marine climate. Most of them have developed under forest vegetation. They resemble soils of other counties in the Puget Sound basin, with the exception of the Kettle Wetland and Seep Wetland, as discussed below.

Kettle wetlands were formed during glacial retreat, in which the stagnant melting ice sheet left large blocks of stranded glacial ice called "dead ice." Glacial meltwater would often flow around these stagnant ice blocks, depositing its river-borne sediment. When the ice blocks later melted, kettles were formed where sediment had been deposited adjacent to the ice blocks. The ice-contact sediment is typically an unstratified silt, sand, and gravel, much lower in permeability than the adjacent outwash. An ablation till can also be formed in kettles when stagnant ice evaporates leaving the glacial fines once contained in the ice as a low permeability deposit. Kettles generally are present in the area as closed topographic depressions, some of which are lakes, bogs, and marshes. Over time, peat, silt, and clay collect in these quiet waters, producing the peat and wetland deposits encountered near the ground surface in these low areas.

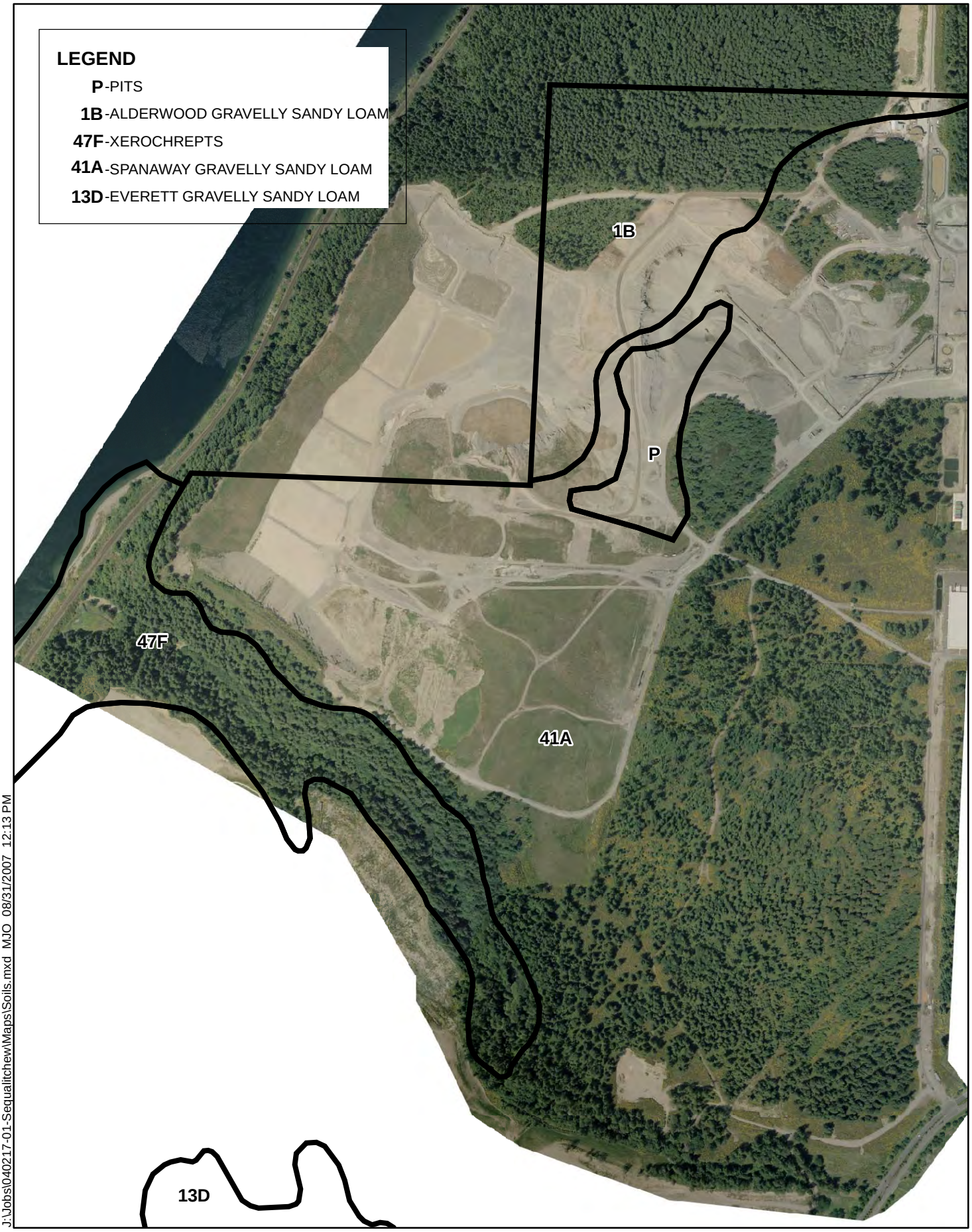
The NRCS has mapped two soil series within the project area (USDA 1979 and 2007), as shown in Figure 2. Spanaway gravelly sandy loam (41A, 0 to 6 percent slopes) dominates the existing and proposed mine areas. These soils are glacial outwash, as discussed above. Near Sequalitchew Creek, soils consist of Xerochrepts (47F, 45 to 70 percent slopes). These soils are very steep and moderately well drained to somewhat excessively drained. Neither of these soils are classified as hydric soils according to Hydric Soil List for Pierce County, Washington (USDA 2001).

Other soils not mapped by the NRCS are present in the Kettle Wetland and the Seep Wetland. In the Kettle Wetland, peat is present above silty clay ranging from 14 to greater than 20 inches in thickness. Finer-grained ablation till "dead ice" deposits were

encountered beneath peat in nearby marshes and are present the peat (Walsh et al. 2003), which appear to be similar to the lower permeability silty clay layer. Elsewhere in the DuPont area, the ice-contact deposits are from dynamic ice where subglacial water flows deposited sand and gravelly sand outwash.

Soils in the Seep Wetland consist of the non-glacial Olympia Bed deposits. The current road (and former narrow-gauge railroad) descends towards Puget Sound along the north bank of the Sequalitchew Creek ravine. The road was constructed on a bench cut in the northern slope of the ravine generally comprised of Spanaway gravelly sandy loam; however, in the area of the Seep Wetland, the lower permeability Olympia Bed deposits become exposed. Field observations confirmed these soils as fine-grained silty sand.

Sample plot soil profiles are described in Section 3.2 and presented in the field data forms in Attachment 1.



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0 250 500 1,000 Feet

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Figure 2
Soil Classification
Wetland Delineation Report
North Sequalitchew Creek Project Impact Area

3.3 Hydrology

Hydrologic characteristics at the site are influenced by the following factors: regional groundwater, direct precipitation, and surface water runoff. For the purpose of this study, the individual contribution of each factor to the hydrologic regime could not be determined.

The Kettle Wetland is located within the Sequalitchew Creek drainage basin and is hydrologically connected with the Vashon aquifer (CH2M Hill 2003a). As an enclosed depression, precipitation falling within the existing vegetated wetland buffer drains towards the Kettle Wetland. Water levels in the Kettle Wetland fluctuate seasonally, from 1 to 2 feet during the summer, to 4 to 6 feet during the winter. The open water component width also varies seasonally from 50 feet during the summer to several hundred feet during the winter. Water levels in the wetland were monitored intermittently at a staff gauge installed in the wetland in 1999 (CH2M Hill 2003b). Water levels over the monitoring period ranged from a high of 6.22 feet in December 1999, to the soil surface (0.63 feet) in October 1999.

For the Seep Wetland, groundwater passes through the overlying sand and gravel layers more quickly than it can infiltrate into the Olympia Beds, causing groundwater to accumulate in the sand and gravel layers that overlay the Olympia Beds. Where the road corridor has cut into the Olympia Beds, groundwater is discharging at the interface between the Olympia Beds and the Spanaway gravelly sandy loam. Water then flows down the surface of the Olympia Beds to the drainage ditch alongside the road.

Sample plot hydrology is described in Section 3.6 and presented in the field data forms in Attachment 1.

3.4 Habitat

Wildlife habitat in the study area is bounded by the existing quarry operation present to the northwest and bisected by several roads. No direct presence of amphibians (e.g., vocalizations) or fish were observed during the Kettle Wetland delineation, although the existing wetland habitat may support amphibians. No evidence of rare, uncommon, or unique wildlife or wildlife habitat is apparent in the study area. Wildlife use of this area likely includes a variety of native and non-native species typical to populated areas of

western Washington. While the Kettle Wetland contains perennial standing water, potential fish and/or salmon use is unknown. Most areas of the Kettle Wetland contain dense emergent vegetation with few pockets of open water, making fish presence unlikely. There are no streams that drain into or out of the Kettle Wetland.

The Seep Wetland contains no standing water, except in the rock lined roadside ditch at the bottom of the wetland. This ditch contains insufficient standing water to support fish. No amphibian species were observed, but the habitat may support amphibians.

The WDFW PHS database does not identify any priority habitats or documented presence of protected species within the study area (WDFW 2003).

3.5 Wetland Buffers Conditions

Wetland buffers around the Kettle Wetland are forested and largely intact and undisturbed up to gravel roads that encircle the wetland. Forested buffer widths range from 215 to 330 feet. The buffer generally slopes down to the wetland edge from around 200 feet above MSL.

Upland forest and shrub communities dominate wetland buffers to the north of the Seep Wetland. The Seep Wetland runs along Sequalitchew Creek Road, leaving no wetland buffer immediately to the south for the width of the road. Beyond Sequalitchew Creek Road, the riparian buffer extends down to Sequalitchew Creek, but is interrupted in one location by a recent repair to the road following a mass wasting event. Total distance from the wetland edge to Sequalitchew Creek is between 150 and 200 feet.

3.6 Wetland Delineation Results

Two wetlands were identified within the study area and are shown in Figures 3 and 4. This section provides a complete description of the Kettle and Seep Wetlands identified in the study area.

3.6.1 Kettle Wetland

The Kettle Wetland is a 1.78-acre enclosed depressional wetland dominated by emergent vegetation with a scrub-shrub boundary. The boundary of the Kettle Wetland was

flagged in the field, as shown in Figure 3. As described in Section 3.2, the emergent area is inundated for all or most of the year. Areas on the fringes contain seasonally saturated soils. Section 3.1.1 describes wetland vegetation found in the emergent and scrub-shrub communities.

Soils consist of 16 to 20 inches of black peat above a layer of lower permeability silty clay. The peat contained low chroma (less than 1) with slightly decomposed wood fragments indicative of extended periods of inundation. Some areas beneath the peat also contained thin organic lenses within the silty clay layer. The silty clay layer appears to correspond to the "dead ice" phenomenon associated with the formation of kettle wetlands. Upland soils adjacent to the wetland boundary are composed of high chroma (greater than or equal to 2), dry, brown Spanaway gravelly sandy loam. The wetland boundary corresponded with a clear change in soils from gravelly sandy loam to peat.

Inundation of up to 3 feet was present throughout the central portion of the Kettle Wetland. Within the wetland near the edges, soil saturation ranged from near the surface to greater than 20 inches. However, several secondary indicators of wetland hydrology were observed in areas with peat soils with saturation well below the surface, including sediment deposits, water marks, and FAC neutral test. No saturation, standing water, or indications of wetland hydrology were observed in adjacent upland areas.

Data was collected at six samples plots, K-1 through K-6 (see Attachments 1 and 2). Plots K-1, K-4, and K-5 contained indicators of hydrophytic vegetation, wetland hydrology, and hydric soils. Plots K-2, K-3, and K-6 contained no hydric soil or wetland hydrology, although K-3 contained hydrophytic vegetation. Forty-eight flags were used to identify the Kettle Wetland boundary.

3.6.2 Seep Wetland

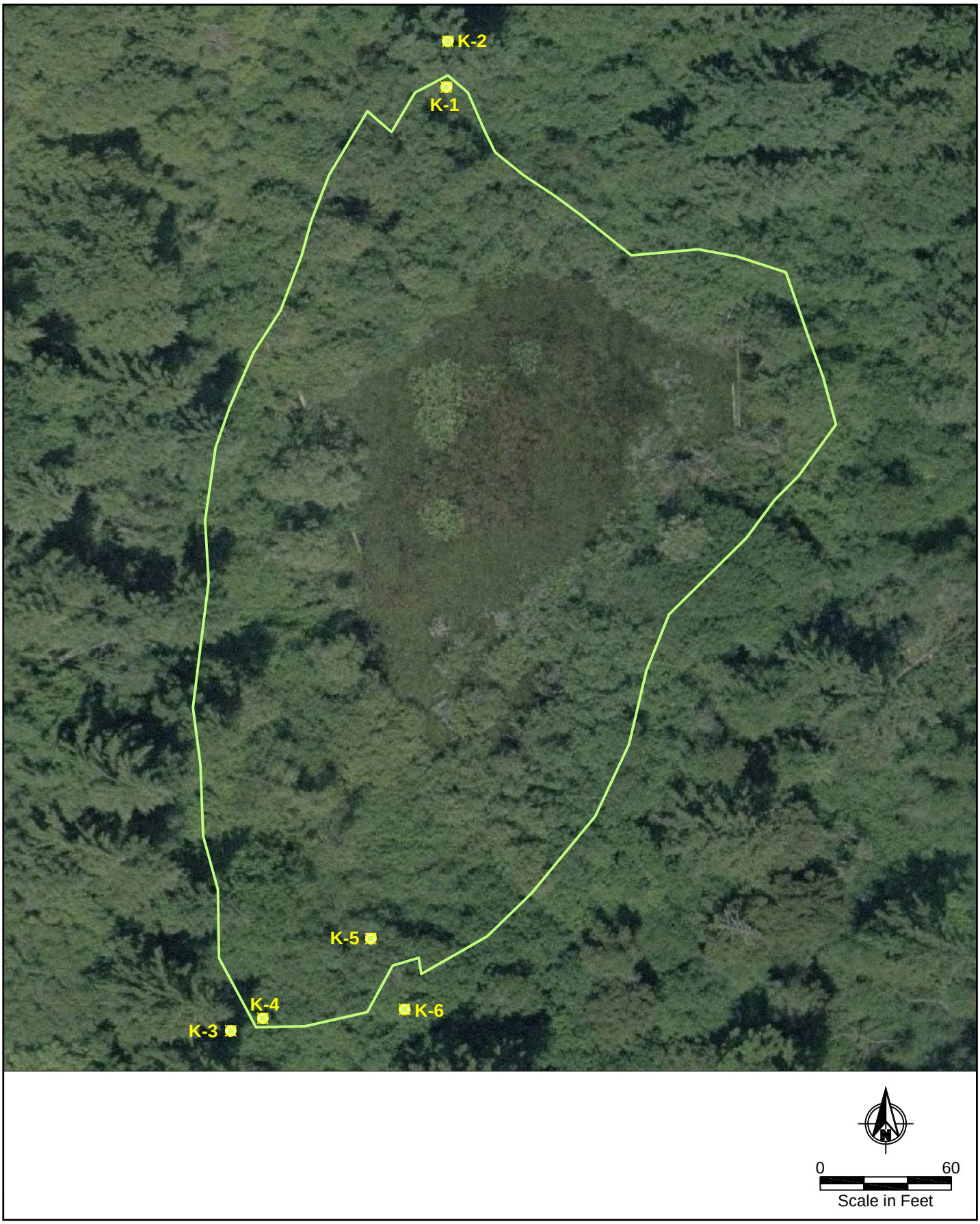
The Seep Wetland is a 0.1-acre wetland where groundwater discharges to the surface across the top of the Olympia Bed soils (Figure 4). The wetland extends approximately 600 feet along Sequalitchew Creek Road. Vegetation is characterized as PEM and contains hydrophytic vegetation described in Section 3.1.2. As described in Section 3.2,

the PEM area contains groundwater that accumulates in the sand and gravel layers that overlay the Olympia Beds. Water discharges where the road corridor has cut into the Olympia Beds, resulting in soils sufficiently saturated to develop wetland characteristics.

Wetland soils consist of greater than 12 inches of brown, dense silty sand with low permeability. The silty sand contains low chroma (less than 2) with mottles indicative of extended periods of saturation. Upland soils along the upper wetland boundary (higher elevation) contain brownish gray gravelly sandy loam.

Saturation was present along the surface of wetland soils in all areas; however, soils 12 to 14 inches below the surface were not always saturated. This may be a result of the lower permeability associated with the Olympia Beds. Water tended to flow across the surface of the Olympia Beds and into the roadside ditch along Sequalitchew Creek Road. No saturation, standing water, or indications of wetland hydrology were observed in adjacent upland areas.

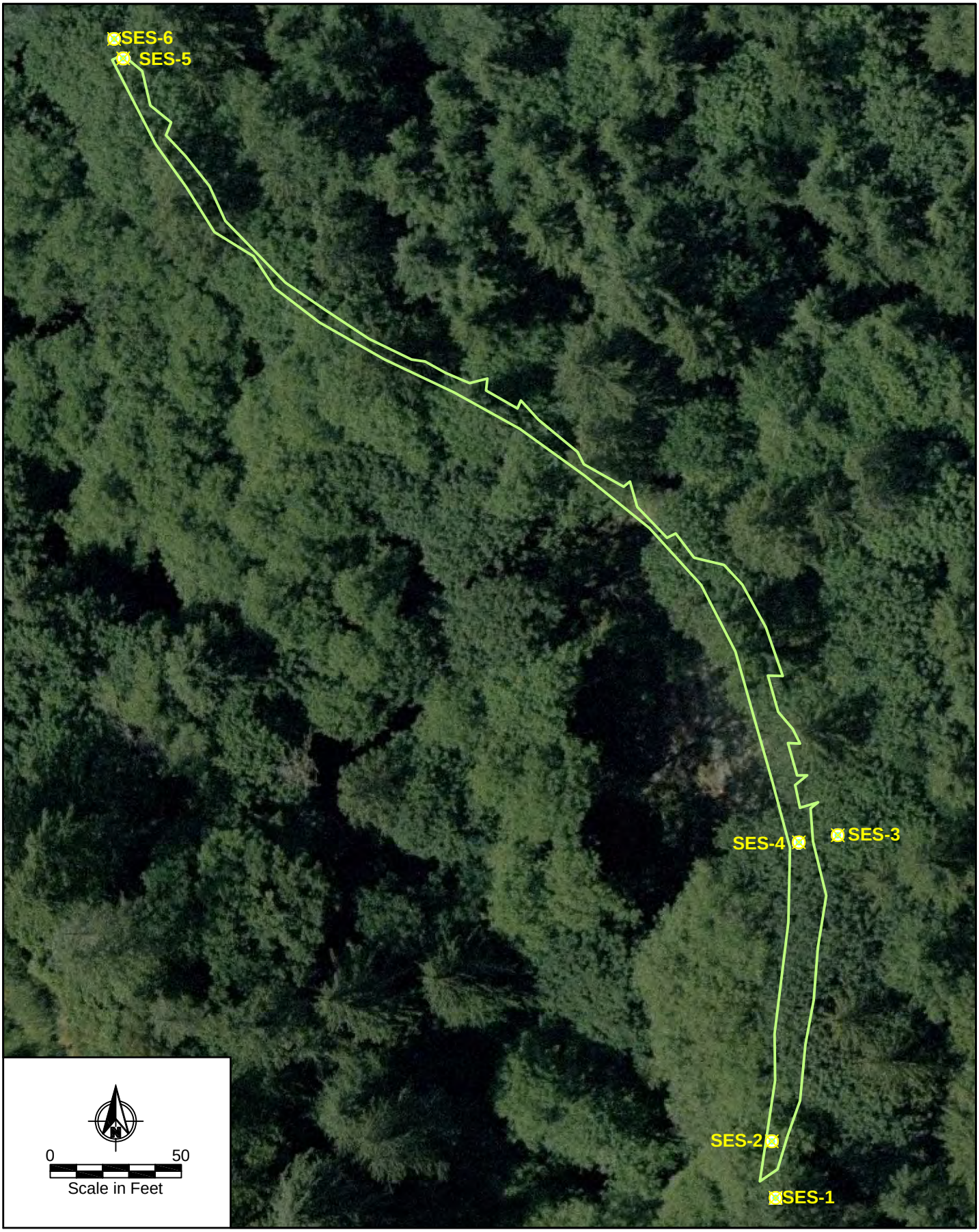
Data was collected at six sample plots, SES-1 through SES-6 (see Attachments 1 and 2). Plots SES-2, SES-4, and SES-6 contained indicators of hydrophytic vegetation, wetland hydrology, and hydric soils. Plots SES-1, SES-3, and SES-5 contained no hydric soil or wetland hydrology, although SES-5 contained hydrophytic vegetation. Eighty-three flags were used to identify the Seep Wetland boundary.



Sep 24, 2007 10:58am cdavidson K: Jobs 070217-Sequalitchew 070217-01 07021701-003.dwg FIG 3

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3
Kettle Wetland
Wetland Delineation Report
North Sequalitchew Creek



Oct 08, 2007 9:39am cdavidson K:\Jobs\070217-Sequalitchew\070217-01\070217-01-003.dwg FIG 4

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Figure 4
Seep Wetland
Wetland Delineation Report
North Sequalitchew Creek

3.7 Regulatory Framework

Federal, state and local governments regulate impacts to wetlands under several laws including the federal Clean Water Act (CWA), the state GMA, and the local Sensitive Areas Regulations, among others. Each agency's jurisdiction over a specific wetland is tied to a specific regulation. The GMA gives the State of Washington jurisdiction over hydrologically isolated wetlands, whereas the Clean Water Act does not grant the Corps jurisdiction over hydrologically isolated wetlands such as the Kettle Wetland described above.

In order to determine the wetland classification, guidelines from USFWS, DuPont, and Ecology were used. Information and excerpts of the specific guidance language are provided below.

3.7.1 USFWS Classification

The wetlands identified in the study area have been classified using the system developed by Cowardin et al. (1979) for use in the NWI. Table 2 lists the USFWS classifications for the wetlands and their connections to surface waters.

Table 2
USFWS Wetland Classifications and Connections to Surface Water

Wetland	USFWS Classification	Connection to Surface Water
Kettle	PEM and PSS	None
Seep	PEM	Roadside ditch

3.7.2 City of DuPont Wetland Classification Guidance

According to the DuPont Sensitive Areas Regulations (DuPont 2007a), wetland ratings are determined by DuPont as either Class I or Class II wetlands. Class I wetlands are "very valuable for a particular rare species or represent a high quality example of a rare wetland type or are rare within the region or provide irreplaceable functions and values, i.e., they are impossible to replace within a human lifetime, if at all." Class II wetlands "provide habitat for very sensitive or important wildlife or plants or are difficult to replace or provide very high functions and values, particularly for wildlife habitat and/or their association with ground water and aquifers." Class II wetlands also "occur more commonly than Class I wetlands and need a high level of protection."

Wetlands within DuPont have been previously assigned Class I or Class II status. Both the Kettle and Seep Wetlands have been classified as Class II wetlands by DuPont regulations. Appropriate minimum wetland buffers have been identified according to the current DuPont Sensitive Areas code (DuPont 2007a). DuPont will determine the final wetland ratings and minimum buffers. DuPont ratings and buffer widths are provided on Table 3.

Table 3
DuPont Sensitive Areas Code Wetland Ratings and Standard Buffer Distance

Wetland	DuPont Rating	DuPont Sensitive Areas Buffer Width (Feet)
Kettle	Class II	100
Seep	Class II	100

3.7.3 Ecology Rating, Classification, and Functions and Values Scores

Wetlands were also rated using Ecology's *Washington State Wetland Rating System for Western Washington: Revised* (Ecology 2004) and *Wetland Rating Form: Western Washington: Revised* (Ecology 2006). This system helps in understanding water quality, hydrologic, and habitat functions provided by each wetland. Table 4 lists the Ecology wetland ratings, classification, and a summary of the rating scores. Ecology Wetland Rating forms are included in Attachment 3.

Table 4
Summary of Wetland Classes, Functions, and Values Rating Scores Using Ecology Wetlands Rating System

Wetland	Wetland Classification	Wetland Category	Total Water Quality Functions[1]	Total Hydrologic Functions[2]	Total Habitat Functions[3]	Total Functions[4]
Kettle	Depressional	II	16	16	19	51
Seep	Slope	IV	3	3	22	28

1 – Maximum possible score = 32
2 – Maximum possible score = 32
3 – Maximum possible score = 36
4 – Maximum possible score = 100

The Seep Wetland scored low for water quality improvement and hydrologic (water storage) functions, partially based on the lack of dense vegetation and steep slope. However, the Seep Wetland provides base flow support to Sequalitchew Creek. The wetland scored higher for habitat quality functions based on its location within a habitat corridor, wide vegetated buffers, and proximity to other wetlands.

The Kettle Wetland was also evaluated using the quantitative *Washington State Methods for Assessing Wetland Functions in Riverine and Depressional Wetlands in the Lowlands of Western Washington* (Ecology 1999a, 1999b). This method ranks wetland functions based on specific on-site observations relative to reference wetlands that perform these functions at optimal levels. Summary spreadsheets using this method for the Kettle Wetland are provided in Attachment 4.

The Kettle Wetland was ranked with this method in August 2007 using the forms for depressional closed wetlands. Functions based on existing conditions are summarized in Table 5. Potential for functioning is rated on a scale of 1 to 10 with 10 being optimal and 1 being barely functional.

Table 5
Summary of Functional Analysis for Kettle Wetland

Potential for	Kettle
Removing sediments	10
Removing nutrients	10
Removing toxics	9
Reducing peak flow	10
Decreasing downstream erosion	10
Recharging groundwater	7
General habitat suitability	4
Habitat suitability for invertebrates	3
Habitat suitability for amphibians	4
Habitat suitability for anadromous fish	N/A
Habitat suitability for resident fish	N/A
Habitat suitability for birds	4
Habitat suitability for mammals	4
Native plant richness	6
Primary production/export	N/A

Note:
Kettle wetland was evaluated using Closed Depressional methodology
N/A = Not applicable

Removal of sediments, nutrients, and toxics and reduction in peak flows and downstream erosion are strong functions of the Kettle Wetland. However, because of the small drainage area and minimal upgradient disturbance, the opportunity for the wetland to provide these functions are low. High quality habitat is not generally provided by this wetland, and the opportunity for it to provide that function is limited by the absence of a habitat corridor in the vicinity of the wetland.

3.8 Wetland Delineation and Typing Limitations

Wetland identification is an inexact science and differences of professional opinion often occur between trained individuals. Final determinations for wetland boundaries and typing concurrence or adjustment needs are the responsibility of the regulating resource agency. Wetlands are, by definition, transitional areas; their boundaries can be altered by changes in hydrology or land use. In addition, the definition of jurisdictional wetlands may change. If a physical change occurs in the basin or 3 years pass before the proposed project is undertaken, another wetland survey should be conducted. The results and conclusions expressed herein represent Anchor's professional judgment based on the information available. No other warranty, expressed or implied, is made.

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ATTACHMENT 1

WETLAND DATA SHEETS

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Kettle Wetland	Date:	7/31/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: K1
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Salix lasiandra	T 60%	FACW+	Urtica dioica	H 15%	FAC+
Pseudotsuga menziesii	T 20%	FACU	Sium suave	H 5%	OBL
Sambucus racemosa	T 5%	FACU			
Spiraea douglasii	S 15%	FACW			
Salix lasiandra	S 10%	FAC+			
Symphoricarpus albus	S 15%	FACU			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 1/2 = 50%

Check all indicators that apply and explain below:

- ☒ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☒ Yes ☐ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No	Water Marks: ☒ Yes ☐ No	Sediment Deposits: ☒ Yes ☐ No	
Based on: Observation	Drift Lines: ☐ Yes ☐ No	Drainage Patterns: ☐ Yes ☐ No	
Depth of inundation: None inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☒ No	Local Soil Survey: ☐ Yes ☒ No	
Depth to free water in pit: None inches	FAC Neutral: ☐ Yes ☐ No	Water-stained Leaves: ☐ Yes ☐ No	
Depth to saturated soil: >20 inches			

Check all that apply & explain below:	Other (explain):
☐ Stream, lake or gage data	
☐ Aerial photographs	
☐ Other	

Wetland hydrology present? ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Dupont muck

Drainage Class Very poorly drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-14	O1	10YR 2,1	None	None	Peat (black, decomposed wood/twigs and peat)	
14-20	O2	10YR 2,1	None	None	Gravelly peat	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☒ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☒ **Yes**	☐ **No**
Hydric soils present?	☒ **Yes**	☐ **No**
Wetland hydrology present?	☒ **Yes**	☐ **No**
Is the sampling point within a wetland?	☒ **Yes**	☐ **No**

Rationale/Remarks:

NOTES:

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Kettle Wetland	Date:	7/31/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: K2
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Polystichum munitum	H 20%	FACU	Pseudotsuga menziesii	T 20%	FACU
Rubus ursinus	H 40%	FACU	Holodiscus discolor	T 10%	NI
Mahonia nervosa	S 20%	FACU	Sambucus racemosa	T 15%	FACU
Symphoricarpos albus	S 20%	FACU	Corylus cornuta	T 10%	FACU
Marah oreganus	V 20%	NI	Carex hendersonii	H 15%	FAC
Salix lasiandra	T 40%	FAC+	Urtica dioica	H 5%	FAC+

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 1/7 = 14%

Check all indicators that apply and explain below:

- ☐ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☐ Yes ☒ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No	Water Marks: ☐ Yes ☐ No	Sediment Deposits: ☐ Yes ☐ No	
Based on: Observation	Drift Lines: ☐ Yes ☐ No	Drainage Patterns: ☐ Yes ☐ No	
Depth of inundation: None inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☐ No	Local Soil Survey: ☐ Yes ☐ No	
Depth to free water in pit: None inches	FAC Neutral: ☐ Yes ☐ No	Water-stained Leaves: ☐ Yes ☐ No	
Depth to saturated soil: None inches			

Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other	Other (explain):

Wetland hydrology present? ☐ **Yes** ☒ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Spanaway gravelly sandy loam

Drainage Class Somewhat excessively drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-14	A	10YR 2,2	None	None	Gravelly sandy loam (brown). Gravel prevented further shovel penetration.	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☐ **Yes** ☒ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☐ **Yes**	☒ **No**
Hydric soils present?	☐ **Yes**	☒ **No**
Wetland hydrology present?	☐ **Yes**	☒ **No**
Is the sampling point within a wetland?	☐ **Yes**	☒ **No**

Rationale/Remarks:

NOTES:

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Kettle Wetland	Date:	8/9/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: K3
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Sambucus racemosa	S 40%	FACU			
Cornus nutallii	S 50%	NI			
Urtica dioica	H 15%	FAC+			
Galium aparine	H 5%	FACU			
Rubus ursinus	H 5%	FACU			
Tolmiea menziesii	H 5%	FACU			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 0/2 = 0%

Check all indicators that apply and explain below:

- ☒ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☐ Yes ☒ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No	Water Marks: ☐ Yes ☒ No	Sediment Deposits: ☐ Yes ☒ No	
Based on: Observation	Drift Lines: ☐ Yes ☒ No	Drainage Patterns: ☐ Yes ☒ No	
Depth of inundation: None inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☒ No	Local Soil Survey: ☐ Yes ☒ No	
Depth to free water in pit: None inches	FAC Neutral: ☐ Yes ☒ No	Water-stained Leaves: ☐ Yes ☒ No	
Depth to saturated soil: None inches			

Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other	Other (explain):

Wetland hydrology present? ☐ **Yes** ☒ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Spanaway gravelly sandy loam

Drainage Class Somewhat excessively drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-6	A	7.5YR 2.5,1	None	None	Loamy gravel; Gravel prevented further penetration.	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Soil chroma is low because color is black, but no other indications of hydric soil are present. No indications of wetland hydrology are present.

Wetland Determination

Hydrophytic vegetation present?	☐ **Yes**	☒ **No**
Hydric soils present?	☒ **Yes**	☐ **No**
Wetland hydrology present?	☐ **Yes**	☒ **No**
Is the sampling point within a wetland?	☐ **Yes**	☒ **No**

Rationale/Remarks:

NOTES:

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Kettle Wetland	Date:	8/9/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: K4
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Salix lasandra	S 40%	FAC+			
Cornus nutallii	S 50%	NI			
Moss	H 10%	None			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 1/2 = 50%

Check all indicators that apply and explain below:

- ☒ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☒ Yes ☐ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No	Water Marks: ☒ Yes ☐ No	Sediment Deposits: ☒ Yes ☐ No
Based on: Observation	Drift Lines: ☒ Yes ☐ No	Drainage Patterns: ☐ Yes ☒ No
Depth of inundation: None inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☒ No	Local Soil Survey: ☐ Yes ☒ No
Depth to free water in pit: 20 inches	FAC Neutral: ☐ Yes ☒ No	Water-stained Leaves: ☒ Yes ☐ No
Depth to saturated soil: 1 inches		

Check all that apply & explain below:	Other (explain):
☐ Stream, lake or gage data	
☒ Aerial photographs	
☐ Other	

Wetland hydrology present? ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Dupont muck

Drainage Class Very poorly drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-8	A1	7.5YR 2.5,1	None	None	Siilty peat (decomposed organic debris)	
8-15	A2	7.5YR 2.5,1	7.5YR 3,2	40% 2 inches	Silty peat with gleyed colors	
15-17	B1	7.5YR 3,2	2.5Y 5,6	10% 1/2 inch	clayey silt with organic lenses	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☒ Other (explain in remarks)

Hydric soils present? ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☒ **Yes**	☐ **No**
Hydric soils present?	☒ **Yes**	☐ **No**
Wetland hydrology present?	☒ **Yes**	☐ **No**
Is the sampling point within a wetland?	☒ **Yes**	☐ **No**

Rationale/Remarks:

NOTES: Matrix chroma <=2 with mottles

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Kettle Wetland	Date:	8/9/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: K5
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Salix lasiandra	T 30%	FAC+			
Salix scouleriana	T 30%	FAC			
Cornus nutallii	S 30%	NI			
Spirea douglasii	S 40%	FACW			
Oenanthe sarmentosa	H 20%	OBL			
Solanum dulcamara	H 5%	FAC+			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 4/5 = 80%

Check all indicators that apply and explain below:

- ☒ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☒ Yes ☐ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No

Based on: Observation

Depth of inundation: None inches

Depth to free water in pit: 20 inches

Depth to saturated soil: 1 inches

Water Marks: ☒ Yes ☐ No	Sediment Deposits: ☒ Yes ☐ No	
Drift Lines: ☒ Yes ☐ No	Drainage Patterns: ☐ Yes ☒ No	
Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☒ No	Local Soil Survey: ☐ Yes ☒ No	
FAC Neutral: ☐ Yes ☐ No	Water-stained Leaves: ☒ Yes ☐ No	

Check all that apply & explain below:

- ☐ Stream, lake or gage data
- ☒ Aerial photographs
- ☐ Other

Other (explain):

Wetland hydrology present? ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Dupont muck

Drainage Class Very poorly drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-14	A1	7.5YR 2.5,1	None	None	Siilty peat (decomposed organic debris)	
14-16	A2	7.5YR 2.5,1	10YR 6,2	20% 1 inch	clayey silt (chalky) and silty peat	
16-20	B	10YR 6,2	None	None	clayey silt (chalky)	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☒ **Yes**	☐ **No**
Hydric soils present?	☒ **Yes**	☐ **No**
Wetland hydrology present?	☒ **Yes**	☐ **No**
Is the sampling point within a wetland?	☒ **Yes**	☐ **No**

Rationale/Remarks:

NOTES:

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Kettle Wetland	Date:	7/31/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: K6
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Polystichium munitum	S 20%	FACU	Galium aparine	H 10%	FACU
Corylus cornuta	T 80%	FACU	Tolmiea menziesii	H 10%	FACU
Salix scouleriana	T 20%	FAC			
Urtica dioica	S 10%	FAC+			
Symphoricarpus albus	S 10%	FACU			
Rubus ursinus	H 10%	FACU			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 1/3 = 33%

Check all indicators that apply and explain below:

- ☐ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☐ Yes ☒ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No	Water Marks: ☐ Yes ☐ No	Sediment Deposits: ☐ Yes ☐ No	
Based on: Observation	Drift Lines: ☐ Yes ☐ No	Drainage Patterns: ☐ Yes ☐ No	
Depth of inundation: None inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☐ No	Local Soil Survey: ☐ Yes ☐ No	
Depth to free water in pit: None inches	FAC Neutral: ☐ Yes ☐ No	Water-stained Leaves: ☐ Yes ☐ No	
Depth to saturated soil: None inches			
Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other	Other (explain):		

Wetland hydrology present? ☐ **Yes** ☒ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Spanaway gravelly sandy loam

Drainage Class Somewhat excessively drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-8	A	10YR 2,2	None	None	Sandy gravel. Gravel prevented further shovel penetration.	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☐ **Yes** ☒ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☐ **Yes**	☒ **No**
Hydric soils present?	☐ **Yes**	☒ **No**
Wetland hydrology present?	☐ **Yes**	☒ **No**
Is the sampling point within a wetland?	☐ **Yes**	☒ **No**

Rationale/Remarks:

NOTES:

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Seep Wetland	Date:	7/31/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: SES-1
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Athyrium filix fermina	H 30%	FAC+	Claytonia sibirica	H 10%	FAC-
Agrostis capillaris	H 30%	FAC	Ilex aquifolium	S 10%	FACU
Rubus spectabilis	S 30%	FAC+	Cirsium arvense	S 10%	FAC-
Alnus rubra	T 40%	FAC	Galium aparine	H 10%	FACU
Pseudotsuga menziesii	T 20%	FACU			
Acer macrophyllum	T 20%	FACU			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 4/6 = 67%

Check all indicators that apply and explain below:

- ☐ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☒ Yes ☐ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No	Water Marks: ☐ Yes ☐ No	Sediment Deposits: ☐ Yes ☐ No	
Based on: Observation	Drift Lines: ☐ Yes ☐ No	Drainage Patterns: ☐ Yes ☐ No	
Depth of inundation: None inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☐ No	Local Soil Survey: ☐ Yes ☐ No	
Depth to free water in pit: None inches	FAC Neutral: ☐ Yes ☐ No	Water-stained Leaves: ☐ Yes ☐ No	
Depth to saturated soil: 20 inches			

Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other	Other (explain):

Wetland hydrology present? ☐ **Yes** ☒ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Xerochrepts, 45 to 79 percent slopes

Drainage Class Moderately well drained to somewhat excessively drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-24	A	5YR 4,4	None	None	Gravelly sandy loam (brownish gray)	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☐ **Yes** ☒ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☒ **Yes**	☐ **No**
Hydric soils present?	☐ **Yes**	☒ **No**
Wetland hydrology present?	☐ **Yes**	☒ **No**
Is the sampling point within a wetland?	☐ **Yes**	☒ **No**

Rationale/Remarks:

NOTES:

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Seep Wetland	Date:	7/31/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: SES-2
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Epilobium ciliatum	H 40%	FACW-	Taraxacum officinale	H 5%	FACU
Athyrium filix fermina	H 20%	FAC+	Juncus effusus	H 10%	FACW
Acer macrophyllum	T 20%	FACU	Geum macrophyllum	H 10%	FAC+
Alnus rubra	T 40%	FAC	Rubus spectabilis	S 15%	FAC+
Agrostis capillaris	H 15%	FAC	Pseudotsuga menziesii	T 10%	FACU
Holcus lanatus	H 5%	FAC			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 3/4 = 75%

Check all indicators that apply and explain below:

- ☐ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☒ Yes ☐ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No	Water Marks: ☐ Yes ☐ No	Sediment Deposits: ☒ Yes ☐ No
Based on: Observation	Drift Lines: ☐ Yes ☐ No	Drainage Patterns: ☐ Yes ☐ No
Depth of inundation: None inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☐ No	Local Soil Survey: ☐ Yes ☐ No
Depth to free water in pit: None inches	FAC Neutral: ☐ Yes ☐ No	Water-stained Leaves: ☐ Yes ☐ No
Depth to saturated soil: 0 - at surface inches		

Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other	Other (explain):

Wetland hydrology present? ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Xerochrepts, 45 to 79 percent slopes

Drainage Class Moderately well drained to somewhat excessively drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-14	A	10YR 4,2	2.5YR 4,8	1/4 inch 20%	Silty sand	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☒ **Yes**	☐ **No**
Hydric soils present?	☒ **Yes**	☐ **No**
Wetland hydrology present?	☒ **Yes**	☐ **No**
Is the sampling point within a wetland?	☒ **Yes**	☐ **No**

Rationale/Remarks:

NOTES:

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Seep Wetland	Date:	7/31/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: SES-3
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Polystichum munitum	S 40%	FACU	Maianthemum dilatatum	H 5%	FAC
Athyrium filix fermina	S 20%	FAC	Vaccinium parvifolium	S 10%	NI
Acer circinatum	S 25%	FAC-	Alnus rubra	T 10%	FAC
Acer circinatum	H 10%	FAC-	Acer macrophyllum	T 5%	FACU
Rubus ursinus	H 10%	FACU	Acer circinatum	T 10%	FAC-
Rubus spectabilis	H 10%	FAC+			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 1/3 = 33%

Check all indicators that apply and explain below:

- ☐ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☐ Yes ☒ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No	Water Marks: ☐ Yes ☐ No	Sediment Deposits: ☐ Yes ☐ No	
Based on: Observation	Drift Lines: ☐ Yes ☐ No	Drainage Patterns: ☐ Yes ☐ No	
Depth of inundation: None inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☐ No	Local Soil Survey: ☐ Yes ☐ No	
Depth to free water in pit: None inches	FAC Neutral: ☐ Yes ☐ No	Water-stained Leaves: ☐ Yes ☐ No	
Depth to saturated soil: None inches			

Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other	Other (explain):

Wetland hydrology present? ☐ **Yes** ☒ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Xerochrepts, 45 to 79 percent slopes

Drainage Class Moderately well drained to somewhat excessively drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-12	A	10YR 2,2	None	None	Very gravelly silt loam with organic component	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☐ **Yes** ☒ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☐ **Yes**	☒ **No**
Hydric soils present?	☐ **Yes**	☒ **No**
Wetland hydrology present?	☐ **Yes**	☒ **No**
Is the sampling point within a wetland?	☐ **Yes**	☒ **No**

Rationale/Remarks:

NOTES:

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Seep Wetland	Date:	7/31/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: SES-4
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Holcus lanatus	H 20%	FAC	Rubus spectabilis	S 10%	FAC+
Athyrium filix fermina	H 40%	FAC	Acer macrophyllum	T 10%	FAC-
Claytonia sibirica	H 25%	FAC-			
Alnus rubra	T 20%	FAC			
Rubus ursinus	H 10%	FACU			
Dactylis glomerata	H 10%	FACU			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 3/4 = 75%

Check all indicators that apply and explain below:

- ☐ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☒ Yes ☐ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No	Water Marks: ☐ Yes ☐ No	Sediment Deposits: ☐ Yes ☐ No	
Based on: Observation	Drift Lines: ☐ Yes ☐ No	Drainage Patterns: ☐ Yes ☐ No	
Depth of inundation: None inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☐ No	Local Soil Survey: ☐ Yes ☐ No	
Depth to free water in pit: None inches	FAC Neutral: ☐ Yes ☐ No	Water-stained Leaves: ☐ Yes ☐ No	
Depth to saturated soil: 1 inches			

Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other	Other (explain):

Wetland hydrology present? ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Xerochrepts, 45 to 79 percent slopes

Drainage Class Moderately well drained to somewhat excessively drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-24	A	5 YR 4,2	2.5YR 4,6	1/2 inch 20%	Slightly silty sand (hard packed)	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☒ **Yes**	☐ **No**
Hydric soils present?	☒ **Yes**	☐ **No**
Wetland hydrology present?	☒ **Yes**	☐ **No**
Is the sampling point within a wetland?	☒ **Yes**	☐ **No**

Rationale/Remarks:

NOTES:

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Seep Wetland	Date:	7/31/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: SES-5
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Equisetum telmateia	H 25%	FACW	Juncus effusus	H 10%	FACW
Athyrium filix fermina	H 20%	FAC			
Alnus rubra	S 20%	FAC			
Agrostis capillaris	H 15%	FAC			
Cirsium arvense	H 15%	FAC-			
Galium aparine	H 10%	FACU			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 3/3 = 100%

Check all indicators that apply and explain below:

- ☐ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☒ Yes ☐ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No	Water Marks: ☐ Yes ☐ No	Sediment Deposits: ☐ Yes ☐ No	
Based on: Observation	Drift Lines: ☐ Yes ☐ No	Drainage Patterns: ☐ Yes ☐ No	
Depth of inundation: None inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☐ No	Local Soil Survey: ☐ Yes ☐ No	
Depth to free water in pit: None inches	FAC Neutral: ☐ Yes ☐ No	Water-stained Leaves: ☐ Yes ☐ No	
Depth to saturated soil: 12 inches			

Check all that apply & explain below:	Other (explain):
☐ Stream, lake or gage data	
☐ Aerial photographs	
☐ Other	

Wetland hydrology present? ☐ **Yes** ☒ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Xerochrepts, 45 to 79 percent slopes

Drainage Class Moderately well drained to somewhat excessively drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-10	A1	10YR 4,2	None	None	Gravelly sandy loam	
10-14	A2	10YR 3,2	None	None	Slightly gravelly sandy loam	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☐ **Yes** ☒ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☒ **Yes**	☐ **No**
Hydric soils present?	☐ **Yes**	☒ **No**
Wetland hydrology present?	☐ **Yes**	☒ **No**
Is the sampling point within a wetland?	☐ **Yes**	☒ **No**

Rationale/Remarks:

NOTES:

DATA FORM 1
Routine Wetland Determination
(WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site:	Sequalitchew Seep Wetland	Date:	7/31/2007
Applicant/owner:	Glacier DuPont	County:	Pierce
Investigator(s):	Dan Berlin	State:	WA
		S/T/R:	S23 T19N R1E

Do normal circumstances exist on the site?	☒ Yes	☐ No	Community ID:
Is the site significantly disturbed (atypical situation)?	☐ Yes	☒ No	Transect ID:
Is the area a potential problem area?	☐ Yes	☒ No	Plot ID: SES-6
Explanation of atypical or problem area:			

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	Indicator	Dominant Plant Species	*Stratum	Indicator
Rubus ursinus	H 20%	FACU	Athyrium filix fermina	H 15%	FAC
Equisetum telmateia	H 40%	FACW	Lapsana communis	H 10%	NI
Rubus spectabilis	S 20%	FAC+			
Acer macrophyllum	T 40%	FAC-			
Alnus rubra	T 40%	FAC			
Galium aparine	H 10%	FACU			

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 3/5 = 60%

Check all indicators that apply and explain below:

- ☐ Regional knowledge of plant communities
- ☐ Physiological or reproductive adaptations
- ☐ Technical Literature
- ☐ Wetland plant list (nat'l or regional)
- ☐ Morphological adaptations
- ☐ Wetland plant database
- ☐ Other (explain)

Hydrophytic vegetation present? ☒ Yes ☐ No

Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? ☒ Yes ☐ No	Water Marks: ☐ Yes ☐ No	Sediment Deposits: ☐ Yes ☐ No	
Based on: Observation	Drift Lines: ☐ Yes ☐ No	Drainage Patterns: ☐ Yes ☐ No	
Depth of inundation: None inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☐ No	Local Soil Survey: ☐ Yes ☐ No	
Depth to free water in pit: None inches	FAC Neutral: ☐ Yes ☐ No	Water-stained Leaves: ☐ Yes ☐ No	
Depth to saturated soil: 2 inches			

Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other	Other (explain):

Wetland hydrology present? ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

SOILS

Map Unit Name (Series and Phase) : Xerochrepts, 45 to 79 percent slopes

Drainage Class Moderately well drained to somewhat excessively drained

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-16	A	7.5YR 4,2	2.5YR 5,8	1/2 to 3/4 inch 50%	Gravelly silty loam	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☒ **Yes**	☐ **No**
Hydric soils present?	☒ **Yes**	☐ **No**
Wetland hydrology present?	☒ **Yes**	☐ **No**
Is the sampling point within a wetland?	☒ **Yes**	☐ **No**

Rationale/Remarks:

NOTES:

ATTACHMENT 2

WETLAND VEGETATION SUMMARY

Attachment 2
Wetland Vegetation Summary

Scientific Name	Common Name	Indicator Status1	Kettle	Seep
Acer circinatum	Vine maple	FAC-		x
Acer macrophylum	Big-leaf maple	FACU	x	x
Alnus rubra	Red alder	FAC	x	x
Agrostis capillaris	Colonial bent-grass	FAC	x	x
Amelanchier alnifolia	Saskatoon	FACU	x	
Arbutus menziesii	Pacific madrone	UPL	x	
Athyrium filix-femina	Lady fern	FAC+		x
Carex hendersonii	Henderson's sedge	FAC	x	
Carex vesicaria	Inflated sedge	OBL	x	
Cirsium arvense	Canada thistle	FACU+		x
Claytonia sibirica	Siberian miner's lettuce	FAC-		x
Cornus nuttalli	Pacific dogwood	UPL	x	
Cornus sericea	Red-osier dogwood	FACW	x	
Corylus cornuta	Beaked hazelnut	FACU	x	
Cytisus scoparius	Scot's broom	UPL	x	
Dactylis glomerata	Orchardgrass	FACU		x
Eleocharis palustris	Creeping spike rush	OBL	x	
Elymus glaucus	Western wild-rye	FACU	x	
Epilobium ciliatum	purple-leaved willow herb	FACW-		x
Equisetum hyemale	Scouring rush	FACW		x
Equisetum telmateia	Giant horsetail	FACW		x
Galium aparine	Cleavers	FACU	x	x
Gaultheria shallon	Salal	FACU	x	
Geum macrophyllum	Large-leaf avens	FACW-		x
Hippuris vulgaris	Common mare's tail	OBL	x	
Holcus lanatus	Velvetgrass	FAC	x	x
Holodiscus discolor	Oceanspray	UPL	x	
Ilex aquifolium	English holly	FACU		x
Juncus effusus	Common rush	FACW		x
Lemna minor	Lesser duckweed	OBL	x	
Lycopus uniflorus	Northern bugleweed	OBL	x	
Lysichiton americanus	Skunk cabbage	OBL	x	
Mahonia nervosa	Oregon grape	UPL	x	
Maianthemum dilatatum	False lily-of-the-valley	FAC		x
Marah oreganus	Manroot	UPL	x	
Oenanthe sarmentosa	Water parsley	OBL	x	
Phalaris arundacea	Reed canary grass	FACW	x	
Polygonum amphibium	Water laydsthumb	OBL	x	
Polygonum hydropiperoides	Mild waterpepper	OBL	x	
Polystichum munitum	Sword fern	FACU	x	x
Populus balsamifera	Black cottonwood	FAC	x	
Potamogeton sp.	Pondweed	OBL	x	
Prunus emarginata	Bitter cherry	FACU	x	
Pseudotsuga menziesii	Douglas fir	FACU	x	x
Pteridium aquilinum	Bracken fern	FACU		
Rhamnus purshiana	Cascara	FAC-		x
Rosa gymnocarpa	Bald hip rose	FACU	x	
Rubus spectabilis	Salmonberry	FAC+		x
Rubus ursinus	Trailing blackberry	FACU	x	x
Salix lasiandra	Pacific willow	FACW+	x	
Salix scouleriana	Scouler's willow	FAC	x	
Salix sitchensis	Sitka willow	FACW	x	
Sambucus caerulea	Blue elderberry	FACU	x	

Attachment 2
Wetland Vegetation Summary

Sambucus racemosa	Red elderberry	FACU	x	
Sium suave	water parsnip	OBL	x	
Solanum dulcamara	Evening nightshade	FAC+	x	
Sparganium eurycarpum	Giant bur-reed	OBL	x	
Spirea douglasii	Hardhack	FACW	x	
Stachys cooleyae	Stachy's hedgenettle	FACW		x
Symphoricarpos albus	Snowberry	FACU	x	
Taraxacum officinale	Common dandelion	FACU		x
Thuja plicata	Western red cedar	FAC	x	x
Tolmiea menziesii	Youth-on-age	FAC	x	
Urtica dioica	Stinging nettle	FAC+	x	
Vaccinium parvifolium	Red huckleberry	UPL	x	x

FAC = facultative

FACU = Facultative upland

FACW = facultative wetland

OBL = obligate wetland

UPL = upland

ATTACHMENT 3

WASHINGTON STATE DEPARTMENT OF ECOLOGY WETLAND RATING RESULTS

Table A3-1
Ecology Wetland Ratings - Kettle Wetland

Depressional Wetlands	Kettle
Water Quality	
D1.1	3
D1.2	4
D1.3	5
D1.4	4
D1 Total	**16**
D2 Total	**1**
D1*D2 Total	**16**
Hydrologic	
D3.1	4
D3.2	7
D3.3	5
D3 Total	**16**
D4 Total	**1**
D3*D4 Total	**16**
Habitat	
H1.1	4
H1.2	2
H1.3	2
H1.4	3
H1.5	3
H1 Total	**14**
H2.1	4
H2.2	1
H2.3	0
H2.4	0
H2 Total	**5**
H1 + H2 Total	**19**
Function Score	
Water Quality	16
Hydrology	16
Habitat	19
Total	**51**

Notes:

Category

Cat 1 = greater than 70

Cat 2 = 51-69

Cat 3 = 30-50

Cat 4 = less than 30

Table A3-2
Ecology Wetland Ratings - Slope Wetland

Slope Wetlands	Seep
Water Quality	
S1.1	0
S1.2	0
S1.3	3
S1 Total	**3**
S2 Total	**1**
S1*S2 Total	**3**
Hydrologic	
S3.1	3
S3.2	0
S3 Total	**3**
S4 Total	**1**
S3*S4 Total	**3**
Habitat	
H1.1	1
H1.2	1
H1.3	1
H1.4	1
H1.5	0
H1 Total	**4**
H2.1	5
H2.2	4
H2.3	4
H2.4	5
H2 Total	**18**
H1 + H2 Total	**22**
Function Score	
Water Quality	3
Hydrology	3
Habitat	22
Total	**28**

Notes:

Category

Cat 1 = greater than 70

Cat 2 = 51-69

Cat 3 = 30-50

Cat 4 = less than 30

ATTACHMENT 4

WASHINGTON STATE FUNCTIONAL ASSESSMENT SPREADSHEET

SITE **Glacier-DuPont** #AU- Kettle

Depressional Closed

Summary of Function Assessments

Function	Index
Potential for Removing Sediment	10
Potential for Removing Nutrients	10
Potential for Removing Heavy Metals and Toxic Organics	9
Potential for Reducing Peak Flows	10
Potential for Reducing Decreasing Downstream Erosion	10
Potential for Groundwater Recharge	7
General Habitat Suitability	5
Habitat Suitability for Invertebrates	4
Habitat Suitability for Amphibians	5
Habitat Suitability for Anadromous Fish	N/A
Habitat Suitability for Resident Fish	N/A
Habitat Suitability for Wetland Associated Birds	4
Habitat Suitability for Wetland Associated Mammals	4
Native Plant Richness	6
Primary Production and Export	N/A

SITE	Depressional Closed Glacier-DuPont	#AU- Kettle
Date		

NOTE: If the score for a function is used as a variable in another function model it is normalized to 1 not 10)

Code	Item	Value
	LANDSCAPE DATA	
D1	Area of AU	0.72
D2	Area of contributing basin (upgradient watershed)	3.58
D3	Land use within 1km of AU	
D3.1	Undeveloped Forest	10
D3.2	Agriculture (field and pasture)	0
D3.3	Clear cut logging (<5yrs since clearing)	0
D3.4	Urban/commercial	50
D3.5	High density residential (> 1residence/acre)	0
D3.6	Low density residential (<= 1 residence/acre)	0
D3.7	Undeveloped areas,	40
	WATER REGIME	
D4		
D4.1		
D4.2		
D5		
D6		
D7		
D8	Inundation	
D8.1	Percent ponded or inundated for >1 month	95
D8.2	Percent of AU with permanent standing water	90
D8.3	Percent of AU with permanent open water	0
D8.4	Percent of AU with unvegetated bars or mudflats	0
D8.5	Unvegetated bars or mudflats	0
D9	Inundation regimes	
D9.1	Permanently Flooded	1
D9.2	Seasonally Flooded	1
D9.3	Occasionally Flooded (<= 1 month)	1
D9.4	Saturated but seldom inundated	0
D9.5		
D9.6		
D10		
D11		
D11.1		
D11.2		
D11.3		
D12	water depths present in AU	
D12.1	0-20cm (<8in)	1
D12.2	20-100cm(8-40in)	1
D12.3	>100cm (>40in)	1
D13		
D13.1		
D13.2		
D13.3		
D13.4		
	VEGETATION	
D14	Cowardin Classes (as % area of AU)	
D14.1	Forest - evergreen	0
D14.2	Forest -deciduous	0
D14.3	Scrub-shrub - evergreen	0
D14.4	Scrub Shrub - deciduous	30
D14.5	Emergent	70
D14.6	Aquatic Bed	0
D15	Does D8.3 + D8.4 + sum (D14.1 to D14.6) = 100 ?	1
D16	% area of herbaceous understory	90
D17	% area of AU with >75% closure of canopy	20
D18		
D19	Plant Richness	
D19.1	number of native plant species	27
D19.2	number of non- native plant species	1
D20	The number of plant assemblages	3
D21	The maximum number of strata	2
D21.1	"vine" stratum dominated by non-native Blackberries	0
D22	Mature trees present in AU	0
D23	Sphagnum bogs	
D23.1	Sphagnum bog component is > 75% of area in AU	0
D23.2	Sphagnum bog component is 50%-75% of area in AU	0
D23.3	Sphagnum bog component is 25%-49% of area in AU	0
D23.4	Sphagnum bog component is 1 - 25% of area in AU	0
D23.5	NO Sphagnum bog component in AU	0
D24	Dominance by non-native plant species	
D24.1	% area of non-native species >75%	0
D24.2	% area of non-native species 50-75%	0
D24.3	%area of non-native species 25-49%	0
D24.4	% area of non-native species 1-24%	1
D24.5	NO cover of non-natives in the AU	0
	HABITAT CHARACTERISTICS	
D25	structure categories in aquatic bed vegetation	0
D26	pH	
D26.1	pH of interstitial water	7
D26.2	pH of open or standing water	7
D27	AU is within 8 km (5mi) of estuary	1
D28	AU is within 1.6km (1 mi) of a lake	0
D29	AU is within 5km (3 mi) of an open field (	0
D30	>1 hectare (2.5 ac) of preferred woody vegetation	1
D31	snags	0
D31.1	At least one snag has a DBH greater than 30cm	0

Potential for Removing Nutrients
Index = 10

Variable	Score
Vsorp	1
D47.3	0
Vvegcover	1
D14.1	0
D14.2	0
D14.3	0
D14.4	30
D14.5	70
D14.6	0
Index for Removing Nutrients	10

Potential for Removing Toxics
Index = 9

Variable	Score
Vsorp	1
D47.3	0
Vph	0
D26.1	7
Vtotemergent	0.97
D14.1	0
D14.2	0
D14.3	0
D14.4	30
D14.5	70
D16	90
Veffectarea1	0.95
D8.1	95
Index for Removing Toxics	9

Potential for Recharging Groudwater
Index = 7

Variable	Score
Vperm	0.1
D48.1	0
D48.2	0
D48.3	1
Veffectarea2	0.95
D8.1	95
D8.3	0
D14.6	0
Index for Recharging Groundwater	7

General Habitat Suitability
Index = 5

Variable	Score
Vbuffcond	0.8
D42	4
V%closure	0.5
D17	20
Vstrata	0.2
D21	2
Vsnags	0.0
D31	0
D31.1	0.0
Vvegintersp	0.3
D39	1
Vlwd	0.8
D44	7
D45	1
Vhydrop	0.67
D9.1	1
D9.2	1
D9.3	1
D9.4	0
Vwaterdepth	1.0
D12.1	1.0
D12.2	1.0
D12.3	1.0
Vwintersp	0.0
D38	0
Vprichness	0.7
D19.1	27.0
D19.2	1.0
Vmature	0.0
D22	0.0
Vedgestruc	0.3
D41	1.0
reducer Vupcover	1.0
D3.3	0.0
D3.4	50.0
D3.5	0.0
D3.6	0.0
Index for General Habitat	5

Habitat Suitability for Invertebrates
Index = 4

Variable	Score
Vsubstrate	0.6
D46.1	1
D46.2	1
D46.3	1
D46.4	0
D46.5	0
D46.6	0
D46.7	0
D46.8	0
Vwintersp	0.00
D38	0
Vlwd	0.8
D44	7
D45	1
Vstrata	0.2
D21	2
Vvegintersp	0.333
D39	1
Vassoc	0.4
D20	3
Vhydrop	0.667
D9.1	1
D9.2	1
D9.3	1
D9.4	0
Vaquatstruc	0
D25	0
sum positive variables	3
reducers Vtannins	1
D36	0
Index for Invertebrate Habitat	4

Habitat Suitability for Amphibians
Index = 5

Variable	Score
Vbuffcond	0.8
D42	4
Vsubstrate	0.75
D46.1	1
D46.2	1
D46.3	1
D46.4	0
D46.5	0
D46.6	0
D46.7	0
D46.8	0
Vwintersp	0.00
D38	0
Vlwd	0.8
D44	7
D45	1
Vwater	0.5
D8.3	0
D14.6	0
D9.1	1
Vsubstruc	1
D35	4
sum positive variables	3.85
reducers Vphow	1
D26.2	7
Vupcover	0.8
D3.2	0
D3.3	0
D3.4	50
D3.5	0
D3.6	0
score for reducers	0.8
Index for Amphibian Habitat	5

SITE	Depressional Closed Glacier-DuPont #AU- Kettle	Potential for Removing Nutrients Index = 10	Potential for Removing Toxics Index = 9	Potential for Recharging Groudwater Index = 7	General Habitat Suitability Index = 5	Habitat Suitability for Invertebrates Index = 4	Habitat Suitability for Amphibians Index = 5
D32							
D33	AU has upland islands 0						
D34							
D35	Key for rating egg-laying structures for amphibians 4						
D36	Tannins present in surface waters 0						
D37	Steep banks suitable for denning 1						
D38	Interspersion between vegetation and open water 0						
D39	Interspersion between Cowardin vegetation classes 1						
D40							
D41	EDGE of AU: 1						
D42	BUFFER of AU: 4						
D43	CORRIDORS of AU: 0						
D44	large woody debris in AU **outside of perm. water** 7						
D45	large woody debris **in permanent water** of AU 1						
	SOILS and SUBSTRATES						
D46	Composition of surface layer (above soil)						
D46.1	deciduous leaf litter 1						
D46.2	other plant litter 1						
D46.3	decomposed organic 1						
D46.4	exposed cobbles 0						
D46.5	exposed gravel 0						
D46.6	exposed sand 0						
D46.7	exposed silt 0						
D46.8	exposed clay 0						
D47	Soil Types						
D47.1	Peat 3						
D47.2	Muck 0						
D47.3	Mineral with clay fraction <30% 0						
D47.4	Clay (clay fraction >30%) 0						
D48	Permeability of soils in seasonally inundated areas						
D48.1	High 0						
D48.2	Moderate 0						
D48.3	Slow 1						
D49							
D49.1							
D49.2							
D49.3							

	Depressional Closed		**Habitat Suitability**	**Habitat Suitability**	**Native Plant**
SITE	**Glacier-DuPont**		**For Birds**	**For Mammals**	**Richness**
		#AU- Kettle	**Index =** **4**	**Index =** **4**	**Index =** **6**
Date					
			Variable **Score**	**Variable** **Score**	**Variable** **Score**
	LANDSCAPE DATA				
D1	Area of AU	0.72			
D2	Area of contributing basin (upgradient watershed)	3.58	**Vbuffcond**	**Vbuffcond**	**Vstrata**
D3	Land use within 1km of AU		0.8	0.8	0.4
D3.1	Undeveloped Forest	10	D1 0.72	D42 4	D21 2
D3.2	Agriculture (field and pasture)	0	D42 4		D21.1 0
D3.3	Clear cut logging (<5yrs since clearing)	0			
D3.4	Urban/commercial	50	**Vsnags**	**Vwaterdepth**	**Vassoc**
D3.5	High density residential (> 1residence/acre)	0	0	1	0.4
D3.6	Low density residential (<= 1 residence/acre)	0	D31 0	D12.1 1	D20 3
D3.7	Undeveloped areas,	40		D12.2 1	
	WATER REGIME		**Vvegintersp**	D12.3 1	**Vmature**
D4			0.3333		0
D4.1			D39 1	**Vcorridor**	D22 0
D4.2				0	
D5			**Vedgestruc**	D43 0	**Vnplants**
D6			0.33		0.9
D7			D41 1	**Vbrowse**	D19.1 27
D8	Inundation			1	
D8.1	Percent ponded or inundated for >1 month	95	**Vspechab**	D30 1	**Vbogs**
D8.2	Percent of AU with permanent standing water	90	0.5		1
D8.3	Percent of AU with permanent open water	0	D8.5 0	**Vemergent2**	D23.4 0
D8.4	Percent of AU with unvegetated bars or mudflats	0	D27 1	1	D23.5 0
D8.5	Unvegetated bars or mudflats	0	D28 0	D1 0.72	Score for variables
D9	Inundation regimes		D29 0	D14.5 70	2.7
D9.1	Permanently Flooded	1	D33 0		
D9.2	Seasonally Flooded	1	**Vpow**	**Vwintersp2**	
D9.3	Occasionally Flooded (<= 1 month)	1	0.00	0.00	**reducers**
D9.4	Saturated but seldom inundated	0	D8.3 0	D1 0.72	**Vnonnat**
D9.5				D38 0	1
D9.6			**Sinverts**		D24.1 0
D10			0.4	**Vow**	D24.2 0
D11				0	D24.3 0
D11.1			**Samphib**	D1 0.72	
D11.2			0.5	D8.3 0	
D11.3					Index for Native Plant Ri
D12	water depths present in AU			**Vbank**	6
D12.1	0-20cm (<8in)	1		1	
D12.2	20-100cm(8-40in)	1		D37 1	
D12.3	>100cm (>40in)	1	sum positive variables		
D13			2.91		
D13.1					
D13.2					
D13.3					
D13.4			**reducers**		
	VEGETATION		**V%closure**		
D14	Cowardin Classes (as % area of AU)		1		
D14.1	Forest - evergreen	0	D17 20		
D14.2	Forest -deciduous	0			
D14.3	Scrub-shrub - evergreen	0			
D14.4	Scrub Shrub - deciduous	30		sum of variables	
D14.5	Emergent	70		4.8	
D14.6	Aquatic Bed	0			
D15	Does D8.3 + D8.4 + sum (D14.1 to D14.6) = 100 ?	1	**score for reducers**	**reducers**	
D16	% area of herbaceous understory	90	1	**Vupcover**	
D17	% area of AU with >75% closure of canopy	20		0.7	
D18				D3.4 50	
D19	Plant Richness		Index for Bird Habitat	D3.5 0	
D19.1	number of native plant species	27	4	D3.6 0	
D19.2	number of non- native plant species	1			
D20	The number of plant assemblages	3		**score for reducers**	
D21	The maximum number of strata	2		0.7	
D21.1	"vine" stratum dominated by non-native Blackberries	0			
D22	Mature trees present in AU	0			
D23	Sphagnum bogs			Index for Mammal Habitat	
D23.1	Sphagnum bog component is > 75% of area in AU	0		4	
D23.2	Sphagnum bog component is 50%-75% of area in AU	0			
D23.3	Sphagnum bog component is 25%-49% of area in AU	0			
D23.4	Sphagnum bog component is 1 - 25% of area in AU	0			
D23.5	NO Sphagnum bog component in AU	0			
D24	Dominance by non-native plant species				
D24.1	% area of non-native species >75%	0			
D24.2	% area of non-native species 50-75%	0			
D24.3	%area of non-native species 25-49%	0			
D24.4	% area of non-native species 1-24%	1			
D24.5	NO cover of non-natives in the AU	0			
	HABITAT CHARACTERISTICS				
D25	structure categories in aquatic bed vegetation	0			
D26	pH				
D26.1	pH of interstitial water	7			
D26.2	pH of open or standing water	7			
D27	AU is within 8 km (5mi) of estuary	1			
D28	AU is within 1.6km (1 mi) of a lake	0			
D29	AU is within 5km (3 mi) of an open field (	0			
D30	>1 hectare (2.5 ac) of preferred woody vegetation	1			
D31	snags	0			
D31.1	At least one snag has a DBH greater than 30cm	0			

SITE	Depressional Closed Glacier-DuPont	#AU- Kettle	Habitat Suitability For Birds Index =	4	Habitat Suitability For Mammals Index =	4	Native Plant Richness Index =	6
D32								
D33	AU has upland islands	0						
D34								
D35	Key for rating egg-laying structures for amphibians	4						
D36	Tannins present in surface waters	0						
D37	Steep banks suitable for denning	1						
D38	Interspersion between vegetation and open water	0						
D39	Interspersion between Cowardin vegetation classes	1						
D40								
D41	EDGE of AU:	1						
D42	BUFFER of AU:	4						
D43	CORRIDORS of AU:	0						
D44	large woody debris in AU **outside of perm. water**	7						
D45	large woody debris **in permanent water** of AU	1						
	SOILS and SUBSTRATES							
D46	Composition of surface layer (above soil)							
D46.1	deciduous leaf litter	1						
D46.2	other plant litter	1						
D46.3	decomposed organic	1						
D46.4	exposed cobbles	0						
D46.5	exposed gravel	0						
D46.6	exposed sand	0						
D46.7	exposed silt	0						
D46.8	exposed clay	0						
D47	Soil Types							
D47.1	Peat	3						
D47.2	Muck	0						
D47.3	Mineral with clay fraction <30%	0						
D47.4	Clay (clay fraction >30%)	0						
D48	Permeability of soils in seasonally inundated areas							
D48.1	High	0						
D48.2	Moderate	0						
D48.3	Slow	1						
D49								
D49.1								
D49.2								
D49.3								

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ANCHOR QEA

Memorandum

February 10, 2018

To: Pete Stoltz, CalPortland

From: Calvin Douglas and John Small, Anchor QEA

cc: Dan Krenz U.S. Army Corps of Engineers (Daniel.A.Krenz@usace.army.mil)

Re: Addendum to 2007 North Sequalitchew Creek Project Impact Area Wetland Delineation Report

This memorandum supplements information provided in the *North Sequalitchew Creek Project Impact Area Wetland Delineation Report* for the Pioneer Aggregates Mine expansion and the associated creation of Sequalitchew Creek in DuPont, Washington (Anchor Environmental 2007). Specifically, this memorandum addresses the Kettle Wetland, which was one of the wetlands delineated in the 2007 report.

A site visit to the Kettle Wetland was performed by Anchor QEA scientists on December 6, 2017. The following supplemental information is being provided due to the length of time that has transpired since the original delineation occurred. Information in this technical memorandum includes the following: 1) the results of the 2017 field investigation; 2) a comparison of existing conditions and the current wetland boundary compared to the 2007 delineation results; and 3) the wetland ratings based on current Washington State Department of Ecology (Ecology) and City of DuPont wetland rating methods. Ecology 2014 Wetland Rating Forms are included in Attachment A.

Methods

As specified by the City of DuPont Municipal Code (DMC; City of DuPont 2018), the current wetland boundary of the Kettle Wetland was identified and delineated according to the methods defined in the *U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0*; Corps 2010), and Ecology's *Washington State Wetland Identification and Delineation Manual* (Ecology 1997). Soil colors were classified by their numerical description, as identified on a Munsell Soil Color Chart (Munsell 1994). Vegetation, soil, and hydrology information were collected at sample plots in locations similar to the previous delineation plots and recorded on field datasheets.

The boundary of the Kettle Wetland was walked with a handheld Trimble GPS that contained the mapped 2007 wetland delineation boundary for comparison with the 2017 site conditions. As described in this memorandum, the wetland boundary observed during the 2017 investigation was

nearly identical to the previous delineation boundary; therefore, no additional flagging or survey of the wetland boundary was performed.

The Kettle Wetland was rated under the *Ecology Washington State Wetland Rating* System - *Western Washington*: 2014 Update (Hruby 2014) and the 2018 DMC Sensitive Areas Regulations (City of DuPont 2018).

Wetland Background

The following is a summary of the background of the Kettle Wetland, which was evaluated as part of this investigation. For a complete description of the Kettle Wetland, refer to the previous delineation report.

The Kettle Wetland was identified during the 2007 delineation as a 1.78-acre palustrine emergent (PEM) and palustrine scrub-shrub (PSS) enclosed depressional wetland system. Wetland studies prior to the 2007 delineation also identified a palustrine aquatic bed (PAB) system within the Kettle Wetland; however, PAB systems are characterized by plant communities that grow principally on or below the surface of the water for most of the growing season in most years. A PAB system was not identified as present in 2007 because few floating aquatic plants were present in the wetland, and the community appeared to grow above the water surface (as emergent plants) for the majority of the growing season.

In 2007 the Kettle Wetland was ranked as a Category II wetland using Ecology's *2004 Washington State Wetland Rating System - Western Washington: Revised* (Ecology 2004) and a Class II wetland under the 2007 DMC (City of DuPont 2007). Under the 2007 DMC, Class II wetlands had a 100-foot sensitive areas buffer.

Results

The Kettle Wetland is an enclosed depressional wetland containing PEM and PSS wetland vegetation. The interior of the wetland is dominated with PEM vegetation and has PSS vegetation along the wetland boundary. Plant species observed during the 2017 investigation were similar to the species identified during the 2007 delineation. Dominant PEM vegetation included creeping spike-rush (*Eleocharis palustris*), giant bur-reed (*Sparganium eurycarpum*), water parsnip (*Sium suave*), water lady's thumb (*Polygonum amphibium*), mild water pepper (*Polygonum hydropiperoides*), skunk cabbage (*Lysichiton americanus*), and inflated sedge (*Carex vesicaria*). Along the wetland boundary, PSS vegetation consisted of Pacific willow (*Salix lasiandra*), Scouler's willow (*Salix scouleriana*), Sitka willow (*Salix sitchensis*), red-osier dogwood (*Cornus sericea*), and hardhack (*Spiraea douglasii*). As with the 2007 results, some PAB plants, such as common duckweed (*Lemna minor*), were observed but did not provide enough cover to meet the criteria of a PAB wetland system.

Inundation levels within the Kettle Wetland were at or near the wetland boundary. Water levels observed during the December site visit are anticipated to be near annual peak levels, based on the time of year of the site visit.

Soils within the Kettle Wetland were 16 to 20 inches of black peat (1 chroma) above a layer of lower permeability silty clay, similar to the 2007 delineation results.

The entire boundary of the Kettle Wetland was walked with a handheld Trimble DGPS that contained the mapped 2007 wetland delineation boundary, for comparison with the 2017 site conditions. The wetland boundary observed during the 2017 investigation was nearly identical to the 2007 delineation boundary, with no discernable variation.

As part of the 2017 investigation, the Kettle Wetland was rated under Ecology's *2014 Washington State Wetland Rating* System *for Western Washington* (Hruby 2014) and the City of DuPont's 2018 regulations (City of DuPont 2018).

Under Ecology's 2014 wetland rating system, the Kettle Wetland meets the criteria of Category III wetland, compared to a Category II wetland under Ecology's 2004 wetland rating system (Hruby 2014; Ecology 2004). This rating difference between the 2004 and the 2014 wetland rating systems is due to the 2014 rating method placing more emphasis on potential pollutants discharging into a wetland, the characteristics of aquatic resources downstream of a wetland, and the presence of aquatic resources with flooding problems downstream of the wetland. The Kettle Wetland received lower scores for these attributes, which contributed to the Category III wetland rating.

Water quality and hydrologic function potential for the Kettle Wetland are rated high for removal of sediments, nutrients, and toxics, and reduction in peak flows and downstream erosion. Potential for the wetland to provide these functions is moderate because of the small drainage area and minimal upgradient disturbance. Water quality and hydrologic improvement functions are rated low because the wetland does not have surface water connections to downstream aquatic resources.

The wetland has moderate potential habitat functions, based on the plant communities and species variation, the variety of hydroperiods provided, and the habitat features present. The wetland has a low landscape potential due to the land use activities in the vicinity of the wetland. The wetland has a high habitat value because the wetland is identified by the Washington Department of Fish and Wildlife (WDFW) as providing habitat for WDFW priority species (native bats). The 2014 Ecology wetland rating forms are included in Attachment A.

According to the 2018 DMC Sensitive Areas Regulations (City of DuPont 2018), wetland ratings are classified as either Class I or Class II wetlands, similar to the DMC regulations in 2007 (City of Dupont 2007). Under the 2018 DMC, the Kettle Wetland again meets the criteria of a Class II wetland. Class II wetlands have a 100-foot sensitive areas buffer.

The Kettle Wetland is more than 1/2 mile from a Water of the United States and has no surface water connection to any other waterbody.

Conclusions

The December 2017 investigation of existing conditions of the Kettle Wetland, compared to the 2007 delineation, resulted in the following conclusions:

- There have been no substantive changes in the Kettle Wetland's vegetation, hydrology, and soil characteristics.
- The wetland boundary of the Kettle Wetland has not changed since the previous delineation.
- The Kettle Wetland is a Category III wetland under Ecology's 2014 wetland rating method, compared to a Category II wetland under Ecology's 2004 rating method.
- The Kettle Wetland is a Class II wetland under the 2018 DMC, the same as under previous delineations.
- The Kettle Wetland is hydrologically isolated from waters of the U.S.

References

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Hruby, T., 2014. *Washington State Wetlands Rating System – Western Washington: 2014 Update*. Washington State Department of Ecology Publication No. 14-06-029..

Munsell, 1994. *Munsell Soil Color Charts*. Kollmorgen Corporation, Baltimore, Maryland.

Attachment A
2014 Ecology Wetland Rating Forms

APPENDIX D

Sediment Sampling Analytical Laboratory Reports

Analytical Resources, Incorporated
Analytical Chemists and Consultants

26 December 2019

John Small
Anchor QEA, LLC
1201 3rd Ave, Suite 2600
Seattle, WA 98101

RE: CalPortland - Kettle Wetland

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
19L0188	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

Amanda Volgardsen, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006-012

PJLA Testing
Accreditation # 66169

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 1910188

Date: December 9, 2019
Project Name: CalPortland - Kettle Wetland
Project Number: 190217-01.01
Project Manager: ~~Eli Patmont~~ John Small
Phone Number: 206-7949461
Shipment Method: Delivered

Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers	Test Parameters: Arsenic	Lead									Comments/Preservation
1	S01-000004-051219	12/5/2019 12:33	SE	1	X	X									
2	S01-004008-051219	12/5/2019 12:33	SE	1	X	X									
3	S02-000004-051219	12/5/2019 11:25	SE	1	X	X									
4	S02-004007-051219	12/5/2019 11:25	SE	1	X	X									
5	S03-000004-051219	12/5/2019 12:56	SE	1	X	X									
6	S03-004007-051219	12/5/2019 12:56	SE	1	X	X									
7	S04-000004-051219	12/5/2019 10:50	SE	1	X	X									
8	S04-004007-051219	12/5/2019 10:50	SE	1	X	X									
9	S05-000004-051219	12/5/2019 13:15	SE	1	X	X									
10	S05-004007-051219	12/5/2019 13:15	SE	1	X	X									
11	S06-000004-051219	12/5/2019 10:25	SE	1	X	X									
12	S06-004008-051219	12/5/2019 10:25	SE	1	X	X									
13															
14															
15															

Notes:

Relinquished By:	Company:		Company:
Eli Patmont	Anchor QEA, LLC	12/11/2019 12:54 Kenny Dang	ART 12/11/19 1254
Signature/Printed Name	Date/Time		Date/Time

Relinquished By:	Company:	Company:
Signature/Printed Name	Date/Time	Date/Time

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

Page____of_____

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Anchor QEA Project Name: CalPortland - Kettle Wetland

COC No(s): (NA) Delivered by: Fed-Ex UPS Courier Hand Delivered Other:

Assigned ARI Job No: KLO188 Tracking No: (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1254 2.3

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D00520 6

Cooler Accepted by: KO Date: 12/11/19 Time: 1254

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other:		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
How were bottles sealed in plastic bags?	Individually	(Grouped)	Not
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	(NA)	YES	NO
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	(NA)		

Were the sample(s) split by ARI? (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: [signature] Date: 12/11/19 Time: 1519 Labels checked by: [signature]

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Analytical Report

Anchor QEA, LLC	Project: CalPortland - Kettle Wetland	
1201 3rd Ave, Suite 2600	Project Number: 190217-01.01	**Reported:**
Seattle WA, 98101	Project Manager: John Small	26-Dec-2019 16:17

Case Narrative

Sample receipt

Samples as listed on the preceding page were received December 11, 2019 under ARI work order 19L0188. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Total Metals - EPA Method 6020A

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

Anchor QEA, LLC	Project: CalPortland - Kettle Wetland	
1201 3rd Ave, Suite 2600	Project Number: 190217-01.01	**Reported:**
Seattle, WA 98101	Project Manager: John Small	12/26/2019 16:17

ANALYTICAL REPORT FOR SAMPLES

Laboratory ID	Sample ID	Matrix	Date Sampled	Date Received
19L0188-01	S01-000004-051219	Solid	12/05/19 12:33	12/11/19 12:54
19L0188-02	S01-004008-051219	Solid	12/05/19 12:33	12/11/19 12:54
19L0188-03	S02-000004-051219	Solid	12/05/19 11:25	12/11/19 12:54
19L0188-04	S02-004007-051219	Solid	12/05/19 11:25	12/11/19 12:54
19L0188-05	S03-000004-051219	Solid	12/05/19 12:56	12/11/19 12:54
19L0188-06	S03-004007-051219	Solid	12/05/19 12:56	12/11/19 12:54
19L0188-07	S04-000004-051219	Solid	12/05/19 10:50	12/11/19 12:54
19L0188-08	S04-004007-051219	Solid	12/05/19 10:50	12/11/19 12:54
19L0188-09	S05-000004-051219	Solid	12/05/19 13:15	12/11/19 12:54
19L0188-10	S05-004007-051219	Solid	12/05/19 13:15	12/11/19 12:54
19L0188-11	S06-000004-051219	Solid	12/05/19 10:25	12/11/19 12:54
19L0188-12	S06-004008-051219	Solid	12/05/19 10:25	12/11/19 12:54

QUALIFIERS AND NOTES

Qualifier	Definition
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
J	Estimated concentration value detected below the reporting limit.
D	The reported value is from a dilution
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S01-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-01 A	SDG:	19L0188
Sampled:	12/05/19 12:33	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-087
% Solids:	22.70	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:09
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.041 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	91.6	20	0.29	0.42	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S01-004008-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-02 A	SDG:	19L0188
Sampled:	12/05/19 12:33	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-088
% Solids:	35.04	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:14
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.041 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	45.9	20	0.19	0.27	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S02-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-03 A	SDG:	19L0188
Sampled:	12/05/19 11:25	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-089
% Solids:	14.80	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:19
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.096 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	19.7	20	0.42	0.62	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S02-004007-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-04 A	SDG:	19L0188
Sampled:	12/05/19 11:25	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-090
% Solids:	25.65	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:23
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.08 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	79.6	20	0.25	0.36	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S03-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-05 A	SDG:	19L0188
Sampled:	12/05/19 12:56	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-091
% Solids:	13.17	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:28
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.081 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	6.37	20	0.48	0.70	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S03-004007-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-06 A	SDG:	19L0188
Sampled:	12/05/19 12:56	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-092
% Solids:	23.88	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:33
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.083 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	58.8	20	0.26	0.39	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S04-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-07 A	SDG:	19L0188
Sampled:	12/05/19 10:50	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-093
% Solids:	18.34	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:37
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.041 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	88.4	20	0.36	0.52	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S04-004007-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-08 A	SDG:	19L0188
Sampled:	12/05/19 10:50	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-094
% Solids:	39.91	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:42
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.081 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	6.20	20	0.16	0.23	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S05-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-09 A	SDG:	19L0188
Sampled:	12/05/19 13:15	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-098
% Solids:	12.77	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 16:04
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.056 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	4.61	20	0.50	0.74	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S05-004007-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-10 A	SDG:	19L0188
Sampled:	12/05/19 13:15	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-099
% Solids:	22.16	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 16:09
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.079 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	65.4	20	0.28	0.42	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S06-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-11 A	SDG:	19L0188
Sampled:	12/05/19 10:25	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-100
% Solids:	17.22	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 16:14
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.031 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	10.3	20	0.38	0.56	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A

Total Metals

S06-004008-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-12 A	SDG:	19L0188
Sampled:	12/05/19 10:25	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-101
% Solids:	20.27	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 16:18
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.098 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	12.3	20	0.31	0.45	

Form I

METHOD BLANK DATA SHEET

EPA 6020A

Total Metals

Blank

Laboratory: Analytical Resources, Inc.
SDG: 19L0188
Client: Anchor QEA, LLC
Project: CalPortland - Kettle Wetland
Batch: BHL0512
Laboratory ID: BHL0512-BLK1
Prepared: 12/18/19 07:15
Matrix: Solid
Preparation: SWN EPA 3050B
Analyzed: 12/24/19 15:05
Sequence: SHL0409
Calibration: CL00053
Instrument: ICPMS2

CAS NO.	Analyte	Concentration (mg/kg wet)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	ND	20	0.07	0.10	U

LCS / LCS DUPLICATE RECOVERY

EPA 6020A

Total Metals

Laboratory:	Analytical Resources, Inc.	SDG:	19L0188
Client:	Anchor QEA, LLC	Project:	CalPortland - Kettle Wetland
Matrix:	Solid	Analyzed:	12/24/19 16:46
Batch:	BHL0512	Laboratory ID:	BHL0512-BS1
Preparation:	SWN EPA 3050B	Sequence Name:	LCS
Initial/Final:	1 g / 50 mL		

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Lead-208	25.0	22.0		87.8	80 - 120

* Indicates values outside of QC limits

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A UCT-KED

Total Metals

S01-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-01 A	SDG:	19L0188
Sampled:	12/05/19 12:33	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-087
% Solids:	22.70	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:09
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.041 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	6.39	20	0.09	0.85	

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INORGANIC ANALYSIS DATA SHEET
EPA 6020A UCT-KED

Total Metals

S01-004008-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-02 A	SDG:	19L0188
Sampled:	12/05/19 12:33	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-088
% Solids:	35.04	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:14
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.041 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	5.13	20	0.06	0.55	

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INORGANIC ANALYSIS DATA SHEET
EPA 6020A UCT-KED

Total Metals

S02-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-03 A	SDG:	19L0188
Sampled:	12/05/19 11:25	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-089
% Solids:	14.80	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:19
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.096 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	4.64	20	0.14	1.23	

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INORGANIC ANALYSIS DATA SHEET
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Total Metals

S02-004007-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-04 A	SDG:	19L0188
Sampled:	12/05/19 11:25	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-090
% Solids:	25.65	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:23
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.08 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	8.48	20	0.08	0.72	

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INORGANIC ANALYSIS DATA SHEET
EPA 6020A UCT-KED

Total Metals

S03-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-05 A	SDG:	19L0188
Sampled:	12/05/19 12:56	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-091
% Solids:	13.17	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:28
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.081 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	4.63	20	0.15	1.40	

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INORGANIC ANALYSIS DATA SHEET
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Total Metals

S03-004007-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-06 A	SDG:	19L0188
Sampled:	12/05/19 12:56	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-092
% Solids:	23.88	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:33
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.083 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	12.3	20	0.09	0.77	

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INORGANIC ANALYSIS DATA SHEET
EPA 6020A UCT-KED

Total Metals

S04-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-07 A	SDG:	19L0188
Sampled:	12/05/19 10:50	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-093
% Solids:	18.34	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:37
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.041 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	8.50	20	0.12	1.05	

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INORGANIC ANALYSIS DATA SHEET
EPA 6020A UCT-KED

Total Metals

S04-004007-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-08 A	SDG:	19L0188
Sampled:	12/05/19 10:50	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-094
% Solids:	39.91	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 15:42
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.081 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	2.84	20	0.05	0.46	

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INORGANIC ANALYSIS DATA SHEET
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Total Metals

S05-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-09 A	SDG:	19L0188
Sampled:	12/05/19 13:15	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-098
% Solids:	12.77	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 16:04
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.056 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	2.04	20	0.16	1.48	

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INORGANIC ANALYSIS DATA SHEET
EPA 6020A UCT-KED

Total Metals

S05-004007-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-10 A	SDG:	19L0188
Sampled:	12/05/19 13:15	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-099
% Solids:	22.16	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 16:09
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.079 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	9.16	20	0.09	0.84	

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INORGANIC ANALYSIS DATA SHEET
EPA 6020A UCT-KED

Total Metals

S06-000004-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-11 A	SDG:	19L0188
Sampled:	12/05/19 10:25	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-100
% Solids:	17.22	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 16:14
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.031 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	2.53	20	0.12	1.13	

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020A UCT-KED

Total Metals

S06-004008-051219

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	CalPortland - Kettle Wetland				
Matrix:	Sediment	Laboratory ID:	19L0188-12 A	SDG:	19L0188
Sampled:	12/05/19 10:25	Prepared:	12/18/19 07:15	File ID:	XDT_m2191224-101
% Solids:	20.27	Preparation:	SWN EPA 3050B	Analyzed:	12/24/19 16:18
Batch:	BHL0512	Sequence:	SHL0409	Initial/Final:	1.098 g Wet / 50 mL
Instrument:	ICPMS2			Calibration:	CL00053

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	1.44	20	0.10	0.90	

Form I

METHOD BLANK DATA SHEET

EPA 6020A UCT-KED

Total Metals

Blank

Laboratory: Analytical Resources, Inc.
SDG: 19L0188
Client: Anchor QEA, LLC
Project: CalPortland - Kettle Wetland
Batch: BHL0512
Laboratory ID: BHL0512-BLK1
Prepared: 12/18/19 07:15
Matrix: Solid
Preparation: SWN EPA 3050B
Analyzed: 12/24/19 15:05
Sequence: SHL0409
Calibration: CL00053
Instrument: ICPMS2

CAS NO.	Analyte	Concentration (mg/kg wet)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	0.03	20	0.02	0.20	J

LCS / LCS DUPLICATE RECOVERY

EPA 6020A UCT-KED

Total Metals

Laboratory:	Analytical Resources, Inc.	SDG:	19L0188
Client:	Anchor QEA, LLC	Project:	CalPortland - Kettle Wetland
Matrix:	Solid	Analyzed:	12/24/19 16:46
Batch:	BHL0512	Laboratory ID:	BHL0512-BS1
Preparation:	SWN EPA 3050B	Sequence Name:	LCS
Initial/Final:	1 g / 50 mL		

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Arsenic-75a	25.0	22.7		90.7	80 - 120

* Indicates values outside of QC limits

APPENDIX E

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND USE GUIDELINES

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on this report or the product of our services without the express written consent of Aspect Consulting, LLC (Aspect). This limitation is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual conditions or limitations and guidelines governing their use of the report. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and recognized standards of professionals in the same locality and involving similar conditions.

Services for Specific Purposes, Persons and Projects

Aspect has performed the services in general accordance with the scope and limitations of our Agreement. This report has been prepared for the exclusive use of the Client and their authorized third parties, approved in writing by Aspect. This report is not intended for use by others, and the information contained herein is not applicable to other properties.

This report is not, and should not, be construed as a warranty or guarantee regarding the presence or absence of hazardous substances or petroleum products that may affect the subject property. The report is not intended to make any representation concerning title or ownership to the subject property. If real property records were reviewed, they were reviewed for the sole purpose of determining the subject property's historical uses. All findings, conclusions, and recommendations stated in this report are based on the data and information provided to Aspect, current use of the subject property, and observations and conditions that existed on the date and time of the report.

Aspect structures its services to meet the specific needs of our clients. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and subject property. This report should not be applied for any purpose or project except the purpose described in the Agreement.

This Report Is Project-Specific

Aspect considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

If changes are made to the project or subject property after the date of this report, Aspect should be retained to assess the impact of the changes with respect to the conclusions contained in the report.

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

Environmental Regulations Are Not Static

Some hazardous substances or petroleum products may be present near the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current local, state or federal regulatory definitions of hazardous substances or petroleum products or do not otherwise present potential liability. Changes may occur in the standards for appropriate inquiry or regulatory definitions of hazardous substance and petroleum products; therefore, this report has a limited useful life.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time (for example, Phase I ESA reports are applicable for 180 days), by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope failure or groundwater fluctuations. If more than six months have passed since issuance of our report, or if any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Phase I ESAs – Uncertainty Remains After Completion

Aspect has performed the services in general accordance with the scope and limitations of our Agreement and the current version of the “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process”, ASTM E1527, and U.S. Environmental Protection Agency (EPA)'s Federal Standard 40 CFR Part 312 "Innocent Landowners, Standards for Conducting All Appropriate Inquiries".

No ESA can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with subject property. Performance of an ESA study is intended to reduce, but not eliminate, uncertainty regarding the potential for environmental conditions affecting the subject property. There is always a potential that areas with contamination that were not identified during this ESA exist at the subject property or in the study area. Further evaluation of such potential would require additional research, subsurface exploration, sampling and/or testing.

Historical Information Provided by Others

Aspect has relied upon information provided by others in our description of historical conditions and in our review of regulatory databases and files. The available data does not provide definitive information with regard to all past uses, operations or incidents affecting the subject property or adjacent properties. Aspect makes no warranties or guarantees regarding the accuracy or completeness of information provided or compiled by others.

Exclusion of Mold, Fungus, Radon, Lead, and HBM

Aspect’s services do not include the investigation, detection, prevention or assessment of the presence of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detection, assessment, prevention or abatement of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Aspect’s services also do not include the investigation or assessment of hazardous building materials (HBM) such as asbestos, polychlorinated biphenyls (PCBs) in light ballasts, lead based paint, asbestos-containing building materials, urea-formaldehyde insulation in on-site structures or debris or any other HBMs. Aspect’s services do not include an evaluation of radon or lead in drinking water, unless specifically requested.