INTERIM ACTION REPORT
FORMER WOOD MILL AND
FUEL OIL TANK #1 AREAS
PORT ANGELES FORMER MILL SITE
700 NORTH ENNIS STREET
PORT ANGELES, WASHINGTON

NOVEMBER 2, 2006

FOR
RAYONIER PROPERTIES, L.L.C.

GeoEngineers

File No. 0137-015-02

Interim Action Report
Former Wood Mill and Fuel Oil Tank #1 Areas
Port Angeles Former Mill Site
700 North Ennis Street
Port Angeles, Washington
File No. 0137-015-02

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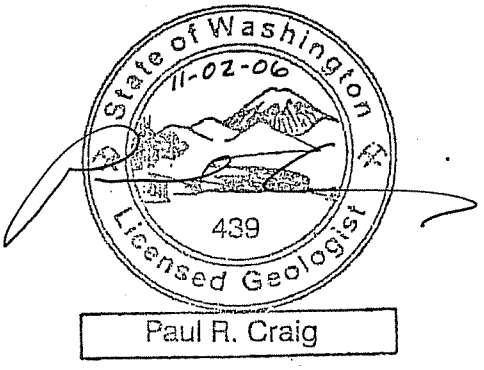

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EXECUTIVE SUMMARY

This interim action report summarizes the remedial activities associated with the excavation and removal of contaminants of concern (COCs) in soil in the former wood mill and fuel oil tank #1 areas at Rayonier's Port Angeles Former Mill site located at 700 North Ennis Street in Port Angeles, Washington (site).

The primary objective of this interim action was to remove and dispose of soil containing diesel- and/or lube oil-range petroleum hydrocarbons (TPH) at concentrations greater than interim action cleanup levels at the former wood mill and fuel oil tank #1 areas of the site. TPH is considered to be potentially mobile in subsurface soils with the capacity to migrate outside of current TPH-impacted areas of the site. The purpose of this interim action was to prevent the potential migration of TPH to other subsurface soils and/or to the former log pond at the site.

The secondary objective of this interim action was to remove compounds potentially associated with TPH where they existed at concentrations greater than their corresponding interim action cleanup levels. Washington State Department of Ecology (Ecology) identifies polychlorinated biphenyls (PCBs), carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and naphthalene as compounds potentially associated with TPH. These TPH-associated compounds were considered COCs for this interim action.

An archeologist from Cascadia Archaeology (Cascadia) of Seattle, Washington was on site during excavation activities in the two interim action excavation areas to monitor for the presence of cultural artifacts. No cultural artifacts were observed during this interim action.

Two distinctly different types of petroleum were observed during excavation activities in the former wood mill area. In the main portion of the excavation area and to the west, petroleum was observed to be pervasive throughout soil between approximately 6 feet bgs and 17 feet bgs. Petroleum in the southeastern portion of the excavation was much more viscous and consisted of lenses between approximately 7 feet bgs and 17 feet bgs.

Different types of petroleum were also observed during excavation activities in the former fuel oil tank #1 area. Petroleum in the eastern portion of the excavation area was observed as a viscous material and was present in soil between approximately 4 feet bgs and 8 feet bgs. The source of the viscous petroleum appeared to be product piping related to fuel oil tank #1. The viscous petroleum extended approximately 75 feet in a westward direction from the location of the pipes. A less viscous petroleum was observed surrounding a catch basin and oil-water separator system in the western portion of the excavation. It appeared that petroleum released from the catch basin system migrated laterally either through lenses of course grained sand and gravel and/or flowed through a former ditch and migrated up to 120 feet to the east. This less viscous petroleum was observed in soil between approximately 2 feet and 15 feet bgs in the western portion of the excavation and between approximately 6 feet and 11 feet bgs in the eastern portion.

The primary objectives of this interim action have successfully been completed. The primary objective was to remove potentially mobile TPH in soil at concentrations greater than interim action cleanup levels from the former wood mill and fuel oil tank #1 areas of the site to prevent the potential migration of TPH to other soils and/or to the former log pond at the site.

- A total of 7,979.3 tons of petroleum-impacted soil were removed from the former wood mill and fuel oil tank #1 areas of the site and transferred to the City Landfill for permitted disposal.
- Hydraulic oil contamination in soil that exceeded interim action cleanup levels in the former wood mill area has been removed from the site as a result of this interim action.

- Petroleum contamination in soil that exceeded interim action cleanup levels in the fuel oil tank #1 area associated with product piping in the eastern portion of the excavation and a catch basin and oil-water separator system in the western portion of the excavation has been removed from the site as a result of this interim action, with one exception: approximately ½ of a cubic yard of soil remains in place adjacent to a utility pole.
- The approximately ½ of a cubic yard of residual petroleum contamination in soil adjacent to the utility pole could not be removed without impacting the structural integrity of the utility pole and potentially exposing the excavation contractor to an electrical safety hazard.
- The concentration of cPAHs in a sample adjacent to the in-place petroleum-impacted soil (mentioned above) also exceeded interim action cleanup levels and may be associated with the residual petroleum.

The secondary objective of this interim action was to remove PCBs, cPAHs and naphthalene that could be potentially associated with TPH where they existed at concentrations greater than their corresponding interim action cleanup levels.

- PCBs and naphthalene in confirmation samples obtained from the final limits of the two excavations either were not detected or were detected at concentrations that were less than the corresponding interim action cleanup levels.
- The calculated concentrations of cPAHs in confirmation samples obtained from the former fuel oil tank #1 area were less than the interim action cleanup level, with one exception. The cPAHs detected in the sample are likely associated with residual petroleum in soil adjacent to a utility pole at the final limits of the excavation.
- The calculated concentrations of cPAHs in confirmation samples obtained from the former wood mill area were less than the interim action cleanup level, with four exceptions: residual cPAHs detected in the four soil samples in the former wood mill area may not entirely be associated with petroleum in soil in the former wood mill area, for the following reasons:
  - TPH, the carrier of TPH-associated cPAHs, was not detected in two of the four samples in which cPAHs were detected at concentrations that exceeded interim action cleanup levels.
  - The highly variable concentrations of cPAHs in sample WM-EX-10-[080806]-16.0 of 0.066 milligrams per kilogram (mg/kg), 0.488 mg/kg and 8.51 mg/kg demonstrates that cPAHs are not homogeneous in the sample.
  - The close proximity of treated wood piles and burnt and un-burnt hog fuel present in the former wood mill area excavation area are potential sources of non-TPH related cPAHs that may have influenced concentrations of cPAHs detected in the samples.

Viscous petroleum remains in place in the southeastern portion of the former wood mill excavation area and appears to be unrelated to activities associated with the former wood mill operations. Although approximately 1,000 tons of soil containing the viscous petroleum was removed in a southeasterly direction in an attempt to find the lateral extent, residual viscous petroleum remains in place to the east of a metal sheet pile wall, which is shown in Figure 4. The removal of this viscous petroleum was not an objective of this interim action and the effort to remove soil containing viscous petroleum was beyond the requirements of the interim action objectives.

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1.0 INTRODUCTION

This interim action report was prepared on behalf of Rayonier Properties, L.L.C. (Rayonier) by GeoEngineers, Inc., in general accordance with Washington Administrative Code (WAC) 173-340-430 and the *Interim Action Work Plan (IAWP),* dated April 27, 2006. This report summarizes the interim remedial action conducted at Rayonier's Port Angeles Former Mill site located at 700 North Ennis Street in Port Angeles, Washington (site). The site occupies approximately 80 acres of land on the Strait of Juan de Fuca. The approximate location of the site relative to surrounding physical features is shown in the attached vicinity map in Figure 1.

This interim action report summarizes the remedial activities associated with the excavation and removal of COCs in soil in the former wood mill and fuel oil tank #1 areas at the former mill site. The locations of these two areas at the site relative to other facilities at the former mill site are shown in Figure 2.

2.0 SITE DESCRIPTION AND BACKGROUND

The Port Angeles former mill facility operated as a pulp and paper mill from 1930 until it was closed in 1997. The former mill site fronts the beach and shoreline on the Strait of Juan de Fuca in Port Angeles, Washington. Ennis Creek bisects the site. Following the mill closure, the Environmental Protection Agency (EPA) conducted an Expanded Site Investigation (ESI) that identified COCs in areas of marine sediment, soil and groundwater that exceeded applicable state criteria for the protection of human health and/or the environment.

Rayonier has completed several studies/interim cleanup actions at the site since the completion of the ESI to address identified COCs. A summary of the site studies and interim cleanup actions completed by Rayonier in the Uplands area of the site is presented in the draft report entitled, *Remedial Investigation for the Uplands Environment of the Former Rayonier Mill Site*, dated January 2006 (Integral Consulting, Inc.).

2.1 SITE HISTORY

2.1.1 Former Wood Mill

The former wood mill is located in the northwestern portion of the site (see Figure 2 and Figure 3) and was used to process raw logs into wood chips for later use in the pulping process. Logs were delivered to the site by rafting, train and/or truck and stored in the adjacent log pond or log yard prior to being processed in the wood mill. The logs were debarked and chipped within the wood mill. The chips were then transferred to another area of the site where they were combined with a fortified ammonium bisulfite cooking liquor and treated at high pressure and temperature in "digesters" to reduce the chips to a cellulose fiber (pulp). Waste materials from the wood mill operations, in the form of bark and wood chips not suitable for pulping, were sent to the hog fuel pile where they were later burned in hog fuel boilers. The hog fuel boilers and recovery boiler generated process steam, which supplied power for the site's energy needs (Integral, 2006).

2.1.2 Former Fuel Oil Tank #1

The former fuel oil tank #1 is located in the southwestern portion of the site (see Figure 2 and Figure 4). Fuel oil tank # 1 contained bunker C oil for use as emergency fuel and startup fuel for boilers at the site.

2.2 Interim Action Work Plan

The draft IAWP was prepared and submitted for public review in March 2006. The IAWP presented the methods and procedures to conduct interim remedial actions in the former wood mill and fuel oil tank #1 areas of the Port Angeles former mill site. The IAWP was finalized in April 2006 after addressing comments made by regulatory agency and tribal representatives. A copy of the IAWP is included in Appendix A of this report for reference.

3.0 CLEANUP OBJECTIVES

The primary objective of this interim action was to remove and dispose of soil containing TPH at concentrations greater than interim action cleanup levels at the former wood mill and fuel oil tank #1 areas of the site. TPH is considered to be potentially mobile in subsurface soils with the capacity to migrate outside of current TPH-impacted areas of the site. The purpose of this interim action was to prevent the potential migration of TPH to other subsurface soils and/or to the former log pond.

The secondary objective of this interim action was to remove compounds potentially associated with TPH where they existed at concentrations greater than their corresponding interim action cleanup levels. Ecology's Model Toxics Control Act (MTCA) identifies PCBs, cPAHs and naphthalene as compounds potentially associated with TPH (WAC 173-340-900, Table 830-1). These TPH-associated compounds were considered COCs for this interim action. Interim action cleanup levels for COCs are presented below in Table 3.0.

Table 3.0

Interim Action Cleanup Levels		
Contaminant of Concern	**Soil Cleanup Level (mg/kg)**	**Reference**
The sum of diesel-, bunker C and lube oil-range hydrocarbons (TPH)	2,000	MTCA Method A for unrestricted land use
PCBs	0.5	MTCA Method B for unrestricted land use
cPAHs	0.14	MTCA Method B for unrestricted land use
Naphthalene	1,600	MTCA Method B for unrestricted land use

Note:
mg/kg = milligrams per kilogram

3.1 Regulatory Framework

Both the EPA and Ecology have conducted routine regulatory compliance inspections at the former Rayonier pulp mill site. In 1997, the EPA initiated a site assessment and hazard ranking scoring process for the former Rayonier pulp mill site to determine if the site should be recommended for the National Priorities List (NPL) under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). An ESI was conducted in support of this effort (E&E 1998). Although the former Rayonier pulp mill site scored high enough to qualify for consideration to be listed on the NPL, the EPA opted to defer the listing and allow a CERCLA-like protective cleanup to proceed under the direction of Ecology. The EPA, Ecology and the Lower Elwha Klallam Tribe ("the Tribe") formally agreed to the deferral in a Deferral Agreement signed in 2000.

As a result of the Deferral Agreement, site evaluation and remediation at the former Rayonier pulp mill site is being conducted under MTCA and implementing regulations (WAC 173-340). MTCA requires that all cleanup activities, including interim actions, comply with applicable state and federal laws and regulations, including requirements that Ecology determines to be applicable or relevant and appropriate requirements (ARARs). Potential ARARs for this interim action are summarized below:

- MTCA (Chapter 70.105D, Revised Code of Washington [RCW]; Chapter 173-340 WAC). This chapter is promulgated under the MTCA. It establishes administrative processes and standards to identify, investigate, and clean up facilities where hazardous substances have come to be located.
- RCW 27.44.040, Protection of Indian graves. This statute makes it a class C felony for any person to knowingly remove, mutilate, deface, injure or destroy any cairn or grave of any native Indian, or any glyptic or painted record of any tribe.
- Federal Endangered Species Act (ESA) (16 USC 1531 et seq.; 50 CFR Parts 17 and 402). The regulations identify those species of wildlife and plants determined to be endangered or threatened with extinction.
- Washington State Solid Waste Management Act (Chapter 70.95 RCW; Chapter 173-351 WAC). This regulation establishes minimum statewide standards for all municipal solid waste landfills in order that jurisdictional health departments can enact ordinances equally as or more stringent than this regulation and have jurisdictional health departments implement such ordinances through a permit system. These minimum statewide criteria ensure the protection of human health and the environment.

Copies of the permits issued for this interim remedial action are presented in Appendix B.

3.2 Affected Media and Contaminants of Concern

3.2.1 Former Wood Mill Area

Soil – COCs were identified in soil samples (station WM20) at concentrations greater than interim action cleanup levels in the former wood mill area during the Remedial Investigation (RI) completed in the upland area of the site. Two samples were obtained from station WM20 that exceeded applicable interim action cleanup levels: 1) a discrete sample obtained from approximately 3 inches bgs; and 2) a composite sample consisting of a direct-push core sample obtained from approximately 3 inches bgs and extending to groundwater (Figure 3).

Groundwater – Groundwater from a monitoring well in a downgradient location (MW-54) was sampled and analyzed for COCs during the RI; COCs either were not detected or were detected at concentrations less than applicable cleanup levels for the site. However, groundwater has been observed to be in contact with soil that has been impacted by concentrations of COCs that are greater than the corresponding interim action cleanup levels.

Three COCs were identified in the former wood mill area during the RI that exceeded their corresponding interim action cleanup levels: 1) TPH; 2) PCBs; and 3) cPAHs. Naphthalene was analyzed in the samples obtained from the area during the RI, but concentrations of the analyte did not exceed the interim action cleanup level. The concentrations for each COC detected in soil samples obtained from the former wood mill area are provided below in Table 3.2.1:

Table 3.2.1

Contaminants of Concern (COCs)					
Station Name	Depth Below Ground Surface	TPH (mg/kg)	PCBs (mg/kg)	cPAHs (mg/kg)	Naphthalene (mg/kg)
WM20	3 inches	3,380	2.78	10	4.2
WM20	3 inches to groundwater*	3,310	0.554	2.3	1.4

Note:
*The actual depth of the sample is unknown

Other contaminants in the former wood mill interim action area include dioxins. Dioxins in soil were analyzed for the 17 toxic dioxin congeners during the RI and a toxicity equivalency factor (TEF) applied to the data to compare them to the tetrachloro dibenzo-p-dioxin toxicity equivalent quotient (TCDD TEQ). The TCDD TEQ concentration of the discrete soil sample obtained from station WM20 in the former wood mill area at a depth of approximately 3 inches bgs was 2.0×10^{-4} milligrams per kilogram (mg/kg) (200 parts per trillion [ppt]) and of the composite soil sample obtained between approximately 3 inches bgs and groundwater was 1.3×10^{-4} mg/kg (130 ppt). Dioxins are significantly less mobile than TPH and it was not the objective of this interim action to cleanup and remove soil affected by these compounds. Dioxins, therefore, are not considered COCs for this interim action.

3.2.2 Fuel Oil Tank No. 1 Area

Soil – Two COCs were identified in soil samples (station LY21) at concentrations greater than interim action cleanup levels in the former fuel oil tank #1 area during the RI completed in the upland area of the site (Figure 4). Two samples were obtained from station LY21 that exceeded applicable interim action cleanup levels: 1) a discrete sample obtained from soil starting at approximately 3 inches bgs; and 2) a composite sample consisting of a direct-push core sample obtained from approximately 3 inches bgs and extending to groundwater. Additionally, physical evidence (soil staining) of petroleum contamination was observed at ground surface in the general area of the former tank.

Groundwater – Groundwater in the general vicinity of this area has not been sampled.

Sampling of soil in the former fuel oil tank #1 area during the RI identified two COCs that exceeded the corresponding interim action cleanup levels: TPH and cPAHs. Naphthalene was analyzed in the samples obtained from the area during the study, but concentrations of the analyte did not exceed interim action cleanup levels. PCBs were not analyzed in samples obtained from station LY21. The range of concentrations for the COCs detected in soil samples obtained from the area is provided below in Table 3.2.2.

Table 3.2.2

Contaminants of Concern (COCs)					
Station Name	Depth Below Ground Surface	TPH (mg/kg)	PCBs (mg/kg)	cPAHs (mg/kg)	Naphthalene (mg/kg)
LY21	3 inches	36,200	--	20.2	2.3
LY21	3 inches to groundwater*	20,400	--	18.4	4.7

Note:
*The actual depth of the sample is unknown:
"--" = not tested

As in the former wood mill area of the site, other contaminants in soil were identified in the former fuel oil tank #1 area. TCDD TEQ concentrations were documented in soil samples at 1.8×10^{-3} mg/kg (1,800 ppt) at 3 inches bgs and 9.0×10^{-5} mg/kg (90 ppt) between 3 inches bgs and groundwater; and the concentration of lead was documented in soil at 429 mg/kg at 3 inches bgs. Dioxins and lead are significantly less mobile than TPH and it was not the objective of this interim action to cleanup and remove soil affected by these constituents. Dioxins and lead, therefore, were not considered COCs for this interim action.

4.0 REMEDIAL ACTIONS

4.1 GENERAL

4.1.1 Location of Underground Utilities

The excavation contractor (Bruch & Bruch Construction, Inc.) contacted the Underground Utilities Location Center ("one call") to locate and mark underground utilities in public right-of-ways in the area. After reviewing available site drawings to identify known underground utilities at the site, arrangements were made with the City of Port Angeles to locate and mark their pressurized sewer line that crosses the former mill site.

The location of the sewer line in the fuel oil tank #1 area at approximately 9 feet bgs was confirmed by test pit exploration at the approximate location marked by the City (see Figure 4). The upper approximately 6 inches of the 24-inch diameter sewer line were exposed during exploration activities. Soil on the sides of the pipeline was left in place to preserve the integrity of the pipeline. City representatives surveyed the location of the sewer line for their own records.

Approximately 50 cubic yards of soil removed during the sewer line exploration activities were stockpiled at the site and later transferred to the City Landfill for disposal. The sewer line exploration area was then backfilled using clean imported soil.

4.1.2 Mobilization and Setup

Mobilization and setup for this interim action was provided by Bruch & Bruch Construction, Inc. and included supplies, personnel and equipment necessary to excavate, dewater, stockpile, load and haul COC-affected soil from the site. A designated truck loading area was setup in the former log yard for the controlled loading of soil for transport to the City Landfill. The former log yard has an asphalt surface on which soil removed from the two excavation areas at the site was stockpiled. Following the loading of trucks that transferred soil from the site to the City Landfill, loose soil on the exterior of the trucks was removed prior to leaving the truck loading area to reduce the likelihood of cross-contamination of non COC-affected areas of the site.

Four-inch diameter PVC piping was connected to storage tanks located immediately south of the former pulp storage warehouse and was used to transfer water from the excavations during dewatering activities. Portable pumps were used to remove the water from the excavations.

An existing permanent chain-link fence erected between Rayonier's property and publicly accessible areas outside the property boundaries of the site served as a barrier to prevent casual access to excavation areas during this interim action. Additionally, approximately 4-foot tall orange cones and orange flagging were placed around the limits of each excavation area at the conclusion of each work day to act as visual barriers for the prevention of inadvertent entry into the excavation areas.

4.1.3 Archaeological Oversight

An archeologist from Cascadia Archaeology (Cascadia) of Seattle, Washington was on site to monitor for the presence of cultural artifacts during excavation in the two interim action areas. A report summarizing Cascadia's findings is presented in Appendix C of this report.

4.2 Former Wood Mill Area

4.2.1 Excavation of Contaminated Soil

Two tracked excavators and a concrete breaker were used to remove soil and concrete in the former wood mill area. Concrete foundations up to 4 feet in thickness were encountered during the excavation activities. Concrete was broken into smaller sizes and removed from the excavation for stockpiling. Soil removed from the excavation area was loaded into an off-road dump truck and transferred to the former log yard area where it was stockpiled on a large, continuous asphalt surface.

Field screening (water sheen testing) was used as an initial indicator to establish the vertical and lateral limits of excavation in the former wood mill area. Field screening methods are described in Appendix D. Soil samples were obtained from the limits of the excavation to confirm field screening observations and were tested for TPH by Ecology Northwest Method NWTPH-Dx using an on-site mobile laboratory owned and operated by Libby Environmental, LLC (Libby) of Olympia, Washington. Soil found to have concentrations of TPH that exceeded the interim action cleanup level of 2,000 mg/kg was overexcavated and removed from the excavation area. Additional soil samples were then obtained from the margin of the overexcavated areas and submitted to the mobile lab for chemical analysis of TPH to document soil conditions at the final limits of excavation.

In general, soil in the western portion of the former wood mill area consisted of brown fine to medium sand between ground surface and approximately 6 feet bgs; gray medium to course sand with course gravel and cobbles between approximately 6 feet bgs and 17 feet bgs; and rip rap ranging in size between 6 inches and 20 inches across below 17 feet bgs. Soil conditions in the eastern portion of the area were similar to those in the western portion, but hog fuel and other wood materials were observed between approximately 8 feet bgs and 14 feet bgs. Large rip rap was observed between approximately 6 feet bgs and 17 feet bgs in the triangular area in the southeastern portion of the former wood mill area. Wooden piles that were used for foundation support in the former wood mill were present in large numbers in the southern portion of the excavation area. Piles that were encountered in the excavation area during remedial activities were removed, when possible.

Two distinctly different types of petroleum were observed during excavation activities in the former wood mill area. In the main portion of the excavation area and to the west, petroleum was observed to be pervasive throughout soil between approximately 6 feet bgs and 17 feet bgs. This petroleum was less viscous than petroleum observed farther to the southeast. Petroleum in the southeastern portion was observed as lenses of viscous petroleum between approximately 7 feet bgs and 17 feet bgs.

Although the removal of the viscous petroleum was not an objective of this interim action, the petroleum appeared to be decreasing both horizontally and vertically as the excavation proceeded in a southeasterly direction. Excavation activities were discontinued when a sheet pile wall was encountered approximately 50 feet east of the main body of the wood mill excavation area. The viscous petroleum in the excavated soil on the western side of the sheet pile wall had been present between approximately 7 feet bgs and 17 feet bgs.

4.2.2 Excavation Dewatering

Dewatering of the former wood mill excavation area was required during removal of contaminated soil located beneath the water table. Groundwater was present in the excavation starting at a depth of approximately 12 feet bgs. A 4-inch pump was installed in a temporary sump at 18 feet bgs to remove an estimated 150,000 gallons of water from the excavation. Removed groundwater was pumped to two on-site tanks (east storage tank and west storage tank) for storage prior to disposal at the City of Port Angeles publicly-owned treatment works (POTW). The east and west storage tanks are located immediately south of the former pulp storage warehouse and are shown in Figure 2.

4.2.3 Confirmation Sampling

Confirmation soil sampling was completed in the former wood mill area to characterize soil conditions for COCs at the final limits of excavation. Nine soil samples were obtained from the base of the excavation for chemical analysis at an approximately 40-foot staggered spacing interval. Ten soil samples were obtained from the sidewalls of the excavation at a spacing interval of approximately 40 feet. Approximate soil sample locations in the former wood mill excavation area are shown in Figure 3.

4.2.4 Waste Handling

A permit for soil disposal was issued by the City of Port Angeles that authorized the transfer of excavated soil from the two interim actions areas at the Port Angeles former mill site to the Port Angeles City Landfill. The application for the permit was prepared by Rayonier and also provided for the disposal of concrete and wood piles removed from the site during excavation activities. A copy of the permit is presented in Appendix E of this report.

Soil removed from the former wood mill excavation area was temporarily stockpiled at the site on a continuous asphalt surface in the former log yard. Stockpiled soil was later loaded onto trucks for transport to the City Landfill for permitted disposal. Wet soil removed from the excavation below the water table also was stockpiled in the former log yard area. The wet soil was mixed with drier soil in the stockpile to stabilize the soil before transport to the City Landfill.

Wooden piles removed from the former wood mill excavation area were stockpiled separately and later transferred to the City Landfill for permitted disposal. Concrete foundations removed from the excavation either were transferred to the City Landfill for disposal or were used as backfill at the base of the former wood mill excavation. Concrete placed back in the excavation was not observed to be impacted by petroleum. The recorded tonnage of soil and debris transferred to the City Landfill for this interim action is 7,979.3 tons (see Appendix E).

4.2.5 Backfilling

Backfilling in the former wood mill excavation area occurred after chemical analysis of soil samples obtained from the final limits of the excavation confirmed that the concentration of petroleum hydrocarbons was less than interim action cleanup levels. Backfill material consisted of clean imported fill that was pushed into the excavation using a bulldozer. The soil was compressed by driving the dozer over the top of the soil after it was placed in the excavation.

4.3 Former Fuel Oil Tank No. 1 Area

4.3.1 Excavation of Contaminated Soil

Two tracked excavators and a concrete breaker were used to remove soil and concrete in the former fuel oil tank #1 area. A concrete pipe tunnel measuring about 4 feet wide by 4 feet thick and 60 feet long was located between ground surface and approximately 4 feet bgs and was used to convey piping beneath a road when the mill was in operation. The location of the tunnel relative to the former fuel oil tank #1 is shown in Figure 4. The pipe tunnel was broken up with a track-mounted concrete breaker and loaded onto trucks for transfer to the City Landfill for disposal. Soil removed from the excavation area was loaded into an off-road dump truck and transferred to the former log yard area of the site where it was stockpiled on a large, continuous asphalt surface.

Water sheen testing was used as an initial indicator to establish the vertical and lateral limits of excavation in the former fuel oil tank #1 area. Soil samples were obtained from the limits of the excavation to confirm field screening observations and were submitted for chemical analysis of TPH by Ecology Northwest Method NWTPH-Dx using Libby's on-site mobile laboratory. Soil found to have concentrations of TPH that exceeded the interim action cleanup level of 2,000 mg/kg was overexcavated and removed from the excavation area. Additional soil samples were then obtained from the margin of the overexcavated areas and submitted to the mobile lab for chemical analysis of TPH to document soil conditions at the final limits of excavation.

In general, soil in the former fuel oil tank #1 area consisted of brown to gray fine sand with varying amounts of silt between ground surface and approximately 4 feet bgs; and gray sand and gravel between approximately 4 feet bgs and 15 feet bgs.

Two distinctly different types of petroleum were observed during excavation activities in the former fuel oil tank #1 area. Petroleum in the eastern portion of the excavation area was observed as a viscous material and was present in soil between approximately 4 feet bgs and 8 feet bgs. The source of the viscous petroleum appeared to be product piping related to fuel oil tank #1. The viscous petroleum extended approximately 75 feet in a westward direction from the location of the pipes. The approximate location of the piping is shown in Figure 4.

A second, less viscous petroleum was observed surrounding a catch basin and oil-water separator system in the western portion of the excavation. It appeared that petroleum released from the catch basin system migrated laterally through lenses of course grained sand and gravel and migrated up to 120 feet to the east. This less viscous petroleum was observed in soil between approximately 2 feet and 15 feet bgs in the western portion of the excavation and between approximately 6 feet and 11 feet bgs in the eastern portion.

Residual petroleum contamination in soil remains in place adjacent to a utility pole in the eastern portion of the excavation. The approximately 8 feet long by 1 foot thick by 1 foot deep lens of contamination was observed in soil at approximately 6 feet bgs and could not be removed without destabilizing the utility pole. The location of the residual contamination is shown in Figure 4.

4.3.2 Excavation Dewatering

Similar to the former wood mill excavation area, dewatering of the former fuel oil tank #1 excavation area was required to remove contaminated soil located beneath the water table. Temporary sumps were constructed in the excavation area to depths ranging between approximately 12 feet and 17 feet bgs to remove an estimated 70,000 gallons of water from the excavation. A portable 3-inch pump was used to transfer groundwater to the tanks for storage prior to at the City's POTW.

4.3.3 Confirmation Sampling

Confirmation soil sampling was completed to characterize soil conditions for COCs at the final limits of excavation in the former fuel oil tank #1 area. Eleven soil samples were obtained for chemical analysis from the base of the excavation at a staggered spacing interval that did not exceed 40 feet. Seventeen soil samples were also obtained from the sidewalls of the excavation at a spacing interval that did not exceed 40 feet. Approximate soil sample locations in the former fuel oil tank #1 area are shown in Figure 4.

4.3.4 Waste Handling

Similar to soil removed from the former wood mill excavation area of the site, soil, concrete and other removed from the former fuel oil tank #1 excavation area was temporarily stockpiled on a continuous asphalt surface in the former log yard. Stockpiled soil was transferred by truck to the City Landfill for permitted disposal.

4.3.5 Backfill

Backfilling in the former fuel oil tank #1 excavation area occurred on a daily basis following the commencement of soil removal activities below the water table. Moderate to heavy petroleum sheens were observed on the surface of groundwater that infiltrated into the excavation through petroleum-impacted portions of the excavation that had not yet been removed. To prevent the petroleum from impacting areas of the excavation that had been confirmed to be "clean" based on the results of chemical analysis of TPH by the on-site mobile lab, the "clean" areas in the fuel oil tank #1 excavation were backfilled at the end of each work day. Dewatering activities resumed at the beginning of each work day to remove oily water from the excavation area for storage in the on-site storage tanks.

Backfill material consisted of clean imported fill that was pushed into the excavation using a bulldozer. The soil was compressed by driving the dozer over the top of the soil after it was placed in the excavation.

5.0 SAMPLING AND ANALYSIS

5.1 Former Wood Mill Area

5.1.1 Confirmation Sampling

Confirmation soil sampling was completed to characterize soil conditions for COCs at the final limits of excavation in the former wood mill area. A total of 19 soil samples were obtained from the base and sidewalls of the excavation for chemical analysis of one or more of the following analytes: TPH by NWTPH-Dx; PCBs by EPA 8082; cPAHs by EPA 8270C SIM; and naphthalene by EPA 8270C SIM. Approximate soil sample locations in the former wood mill area are shown in Figure 3. Total cPAH concentrations (calculated as the benzo(a)pyrene toxicity equivalency concentration [TEC]) are shown in Table 2. Individual cPAH concentrations and the TEC calculations are shown in Table 3. Figures 3 and 4 show the approximate locations of the soil samples. Field sampling procedures are described in Appendix D. Appendix F presents the chemical analytical data sheets and our review of the laboratory QA/QC data quality exceptions.

Soil sample WM-EX-14-[080806]-14.0 was also submitted for chemical analysis of dioxins/furans by EPA Method 1613B. The purpose of the additional testing was to characterize soil conditions in the area of soil sample WM20 (located within approximately 10 feet of WM-EX-14-[080806]-14.0) in which dioxins/furans were detected in a previous study. Dioxins/furans in WM-EX-14-[080806]-14.0 were analyzed for the 17 toxic dioxin congeners and a toxicity equivalency factor (TEF) applied to the data to compare them to the tetrachloro dibenzo-p-dioxin toxicity equivalent quotient (TCDD TEQ). The TCDD TEQ concentration of WM-EX-14-[080806]-14.0 is 6.3 picograms per gram (pg/g) (6.3 parts per trillion [ppt]). Individual dioxin congener concentrations and the TEQ calculations are shown in Table 4. TCDD TEQ is not a COC, so an interim action cleanup level is not available for comparison.

TPH either were not detected or were detected at concentrations less than the interim action cleanup level of 2,000 mg/kg in the nineteen soil samples submitted for chemical analysis from the former wood mill excavation area, with one exception: Bunker C-range hydrocarbons were detected at a concentration of 20,100 mg/kg in sample WM-EX-11-[080806]-12.0, located in the southeastern portion of the excavation. Soil represented by WM-EX-11-[080806]-12.0 was subsequently overexcavated and removed from the site for permitted disposal. A second soil sample (WM-EX-11-[080806]-17.0) was then obtained from the base of the overexcavation at the approximate location of WM-EX-11-[080806]-12.0, but 5 feet deeper, to characterize soil conditions at the final limits of excavation. Bunker C-range hydrocarbons were not detected (less than 80 mg/kg) in WM-EX-11-[080806]-17.0.

PCBs, cPAHs and naphthalene either were not detected or were detected at concentrations less than the corresponding interim action cleanup levels for the soil samples submitted for chemical analysis from the former wood mill excavation area, with four exceptions: cPAHs were detected at concentrations ranging between 0.186 mg/kg and 0.515 mg/kg in three of the four samples (WM-EX-15-[080806]-14.0, WM-EX-16-[080806]-14.0 and WM-EX-18-[080806]-9.0), which exceeded the interim action cleanup level of 0.14 mg/kg. TPH were detected in only one of the three soil samples (WM-EX-18-[080806]-9.0) and its concentration (1,780 mg/kg) was less than the interim action cleanup level of 2,000 mg/kg.

Three tests were completed for chemical analysis of cPAHs for WM-EX-10-[080806]-16.0, the fourth of four samples that exceeded the interim action cleanup level for cPAHs. One of these samples is a duplicate that is designated WM-DUP-1. The sample results indicated that cPAHs were detected at a concentration of 0.066 mg/kg for WM-DUP-1, and 0.488 mg/kg and 8.51 mg/kg for two separate analyses of WM-EX-10-[080806]-16.0. TPH were detected in the sample at a concentration of 709 mg/kg.

Based on the highly variable results for cPAHs in WM-EX-10-[080806]-16.0, and the detection of cPAHs in WM-EX-15-[080806]-14.0 and WM-EX-16-[080806]-14.0 where TPH were not detected, the cPAHs detected in the four samples that exceeded the interim action cleanup level may not be associated with petroleum. Other potential sources of cPAHs that were observed during excavation activities in the former wood mill area include treated wood piles used for the support of concrete foundations for the former wood mill that were present in the excavation, burnt hog fuel that was used as backfill beneath the former mill, or unburnt hog fuel that was generated as a direct result of chipping and debarking activities associated with the former wood mill. Removal of these other potential sources of cPAHs was not an objective of this interim action.

5.2 Former Fuel Oil Tank No. 1 Area

5.2.1 Confirmation Sampling

Confirmation soil sampling was completed to characterize soil conditions for COCs at the final limits of excavation in the former fuel oil tank #1 area. A total of 29 soil samples were obtained from the base and sidewalls of the excavation for chemical analysis of one or more of the following analytes: TPH by NWTPH-Dx; PCBs by EPA 8082; cPAHs by EPA 8270C SIM; and naphthalene by EPA 8270C SIM. Approximate soil sample locations in the former fuel oil tank #1 area are shown in Figure 4.

Soil sample FOT-EX-10-[080706]-11.5 also was submitted for chemical analysis of dioxins/furans by EPA Method 1613B and lead by EPA Method 6020. The purpose of the additional testing was to characterize soil conditions in the area of soil sample LY21 in which dioxins/furans and lead were detected in a previous study at the site. Soil samples representing LY21 and FOT-EX-10-[080706]-11.5 were obtained from approximately the same location, but at differing depths. Dioxins/furans in FOT-EX-10-[080706]-11.5 were analyzed for the 17 toxic dioxin congeners and a TEF applied to the data to compare them to the TCDD TEQ. The TCDD TEQ concentration of FOT-EX-10-[080706]-11.5 is 6.4 pg/g (6.4 ppt). Individual dioxin

congener concentrations and the TEQ calculations are shown in Table 4. Lead was detected at a concentration of 1.3 mg/kg. TCDD TEQ and lead are not COCs, so an interim action cleanup level is not available for comparison.

TPH either were not detected or were detected at concentrations less than the interim cleanup level of 2,000 mg/kg in the soil samples submitted for chemical analysis from the former fuel oil tank #1 excavation area, with three exceptions: Bunker C-range hydrocarbons were detected at a concentration of 41,100 mg/kg in sample FOT-EX-PCS-[080206]-11; 4,900 mg/kg in FOT-EX-10-[080306]-10.5; and 67,000 mg/kg in FOT-EX-11-[080306]-8.0.

FOT-EX-PCS-[080206]-11 was located in the western portion of the excavation and was obtained to characterize contamination in soil surrounding a catch basin. Soil represented by FOT-EX-PCS-[080206]-11 was subsequently overexcavated and transferred off site for permitted disposal. Soil sample FOT-EX-5-[080206]-15.0 was obtained from approximately 4 feet beneath FOT-EX-PCS-[080206]-11 to characterize soil conditions after overexcavation activities in which approximately 4 feet of soil were removed from the base of the excavation. Bunker C-range hydrocarbons were not detected in FOT-EX-5-[080206]-15.0.

Soil represented by samples FOT-EX-10-[080306]-10.5 and FOT-EX-11-[080306]-8.0 was subsequently overexcavated and transferred off site for permitted disposal. Bunker C-range hydrocarbons were not detected in soil samples FOT-EX-10-[080306]-11.5 and FOT-EX-11-[080306]-9.0, which were located approximately 1 foot beneath samples FOT-EX-10-[080306]-10.5 and FOT-EX-11-[080306]-8.0, respectively, and represent soil conditions at the base of the overexcavation following the removal of approximately 1 foot of soil.

PCBs, cPAHs and naphthalene either were not detected or were detected at concentrations less than the corresponding interim action cleanup levels for the soil samples submitted for chemical analysis from the former fuel oil tank #1 excavation area, with one exception: cPAHs were detected at a concentration of 0.163 mg/kg in sample FOT-EX-17-[080806]-3.0, which slightly exceeded the interim action cleanup level of 0.14 mg/kg. Soil represented by FOT-EX-17-[080806]-3.0 remains in place adjacent to residual petroleum contamination that remains in soil adjacent to a utility pole in the eastern portion of the fuel oil tank #1 excavation area and mentioned in Section 4.2.1 above.

5.3 Characterization of Recovered Groundwater

5.3.1 Disposal Characterization Sampling

Water sampling was completed to characterize groundwater removed from the two excavation areas during this interim action prior to transfer to the City of Port Angeles POTW. Approximately 220,000 gallons of water were transferred from the excavations to two tanks located immediately south of the former pulp storage warehouse at the site. The locations of the former pulp storage warehouse and the tanks are shown in Figure 2.

Water samples ("East Tank – [080906]" and "West Tank – [080906]") were obtained from the east tank and west tank, respectively, and composited at the testing laboratory. The composite sample was designated "Storage Tank – [080906]" and submitted for the following chemical analyses: gasoline-range hydrocarbons, benzene, toluene, ethylbenzene and xylenes by Ecology Northwest Method NWTPH-Gx/BTEX; petroleum-range hydrocarbons by Ecology Northwest Method NWTPH-Dx; total lead by EPA Method 200.8; PCBs by EPA Method 8082; TCDD by EPA Method 1613B; total suspended solids by EPA Method 160.2; and pH by EPA Method 150.1. The concentrations of individual analytes detected in Storage Tank – [080906] were less than discharge quality maximum concentration levels for independent leaking underground storage tank cleanup sites. The maximum concentration levels were provided by Ecology for this interim action for

discharge to the POTW. A copy of the laboratory report is presented in Appendix F and summarized in Table 1. The groundwater recovered during this interim action remained in the east and west storage tanks at the site at the time this report was published. We understand that the fluids will be transferred by Rayonier to the City of Port Angeles POTW by the end of 2006.

5.3.2 QA/QC Sampling

5.3.2.1 Equipment Rinsates

Two equipment rinsate samples (FOT-RINSATE-[080406] and WM-RINSATE-[080806]) were obtained to demonstrate the adequacy of equipment decontamination procedures performed between soil sampling locations. One equipment rinsate sample was collected from a sampling trowel used to obtain soil samples during this interim action for each of the two interim action excavation areas at the site. The rinsate was collected after cleaning and decontamination of the trowel under normal operating conditions. Collection of each of the discrete rinsate samples was conducted by pouring purified water over the trowel and collecting the rinsate in laboratory-provided sample containers. Each of the samples was then submitted for chemical analysis of TPH by Ecology Northwest Method NWTPH-Dx. TPH were not detected (less than 500 micrograms per liter [µg/L]) in the two rinsate samples. A copy of the laboratory report is presented in Appendix F of this report.

5.3.2.2 Field Duplicates

Three field duplicate samples (FOT-DUP-1, FOT-DUP-2 and WM-DUP-1) were collected during this interim action to replicate analyses performed in the laboratory. FOT-DUP-1 (duplicate of sample FOT-EX-10-[080306]-10.5) was submitted for chemical analysis of TPH by Ecology Northwest Method NWTPH-Dx. A second duplicate sample from the fuel oil tank #1 area, FOT-DUP-2 (duplicate of FOT-EX-22-[080806]-5.0), was obtained and submitted for chemical analysis of PCBs by EPA Method 8082, and cPAHs and naphthalenes by EPA Method 8270C SIM.

Sample WM-DUP-1 (duplicate of WM-EX-10-[080806]-16.0) was submitted for chemical analysis of TPH by Ecology Northwest Method NWTPH-Dx; PCBs by EPA Method 8082; and cPAHs and naphthalenes by EPA Method 8270C SIM. See Table 5.3.2.2 below for a comparison of the sample results.

Table 5.3.2.2

Sample Name	Diesel-Range Hydrocarbons (mg/kg)	Bunker C-Range Hydrocarbons (mg/kg)	Oil-Range Hydrocarbons (mg/kg)	PCBs (mg/kg)	PAHs (mg/kg)	Naphthalene (mg/kg)
FOT-DUP-1	<25	4,000	<40	--	--	--
FOT-EX-10-[080306]-10.5	<25	4,900	<40	--	--	--
FOT-DUP-2	--	--	--	<0.11	0.007	<0.0072
(FOT-EX-22-[080806]-5.0)	--	--	--	<0.054	0.023	<0.0072
WM-DUP-1	<25	730	<40	<0.057	0.066	0.019
WM-EX-10-[080806]-16.0	<25	709	<40	<0.061	0.488	0.21
WM-EX-10-[080806]-16.0	--	--	--	--	8.51	--

Notes:
"--" = not tested

The variability of the cPAH sample results for WM-DUP-1 and WM-EX-10-[080806]-16.0 appear to be related to a non-TPH source. See section 5.1.1 for further discussion of the results.

6.0 LIMITATIONS

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

Please refer to Appendix G titled *Report Limitations and Guidelines for Use* for additional information pertaining to use of this report.

7.0 REFERENCES

Cascadia Archaeology, October 4, 2006, Cultural Resource Monitoring at Two Remediation Sites at the Former Rayonier Port Angeles Mill, Clallam County, Washington.

GeoEngineers, Inc., April 27, 2006, Interim Action Work Plan, Port Angeles Former Mill Site, Port Angeles, Washingington.

Integral Consulting, Inc., January 2006, Remedial Investigation for the Uplands Environment of the Former Rayonier Mill Site.

Foster Wheeler, June 2002, Volume IV: Interim Action Work Plan – Final, Former Rayonier Pulp Mill Site, Port Angeles, Washington.

Washington State Department of Ecology, February 2001, Model toxics control act — cleanup Chapter 173-340 WAC.

United States Environmental Protection Agency, October 1997, Protection of Archaeological Resources, 43 CFR 7

United States Environmental Protection Agency, February 1977, Endangered and Threatened Wildlife And Plants, 50 CFR 17

EPA, 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. EPA 540/R-99/008. October 1999.

EPA, 2002. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. EPA 540-R-01-008. July 2002.

TABLE 1
SUMMARY OF STORAGE TANK WATER CHEMICAL ANALYTICAL DATA[1]
RAYONIER PROPERTIES, LLC
PORT ANGELES FORMER MILL SITE
PORT ANGELES, WASHINGTON

Sample Identification[2]	Date Sampled	NWTPH-Gx/BTEX (µg/L)					NWTPH-Dx (mg/L)		EPA 200.8 (µg/L)	EPA 8082 (µg/L)	EPA 1316B (µg/L)	EPA 160.2 (mg/L)	EPA 150.1
		Benzene	Ethylbenzene	Toluenes	Xylenes	Gasoline-Range Hydrocarbons	Diesel-Range Hydrocarbons	Lube Oil-Range Hydrocarbons	Total Lead	Polychlorinated Biphenyls	Dioxins/ Furans	Total Suspended Solids	pH
On-Site Storage Tanks (West Tank and East Tank)													
STORAGE TANK-[080906][3]	08/09/06	<1.0	<1.0	<1.0	<1.0	110	0.26	<0.40	5.1	<0.050	<10.0	60	7.0
Discharge Quality Maximum Concentration Levels[4]		5.0	100	100	100	1,000	10	10	15	0.1	--	--	6.0 - 9.0

Notes:

[1] Chemical analyses for 2005/2006 samples by North Creek Analytical in Bothell, Washington

[2] Approximate tank locations are shown in Figure 2.

[3] Composite sample of East Tank-[080906] and West Tank-[080906]

[4] Discharge concentration levels are for discharges to Publicly Owned Treatment Works under the Independent Leaking Underground Storage Tank Cleanup Sites. This guidance was provided by Ecology.

"--" = no discharge quality maximum concentration level is available.

Shading indicates that the chemical analytical result exceeds the Discharge Quality Maximum Concentration Levels

Redm:\02\Finals\0137-015-02, Tables\Table 1.xls

TABLE 2
SUMMARY OF FIELD SCREENING AND SOIL CHEMICAL ANALYTICAL DATA[1]
RAYONIER PROPERTIES, LLC
PORT ANGELES FORMER MILL SITE
PORT ANGELES, WASHINGTON

Sample Identification[2]	Date Sampled	Sample Depth (feet bgs)[3]	Field Screening: Water Sheen	Diesel-Range Hydrocarbons[4] (mg/kg)	Bunker C-Range Hydrocarbons[4] (mg/kg)	Oil-Range Hydrocarbons[4] (mg/kg)	PCBs[5] (mg/kg)	PAHs[6] (mg/kg)	Naphthalene[7] (mg/kg)
Former Fuel Oil Tank #1 Excavation Area Confirmation Samples									
FOT-EX-1-[080106]-9.5	08/01/06	9.5	NS	<25	<80	<40	<0.062	0.007	<0.0082
FOT-EX-2-[080206]-9.0	08/02/06	9.0	NS	<25	<80	<40	<0.054	0.007	<0.0072
FOT-EX-3-[080206]-11.0	08/02/06	11.0	NS	<25	<80	<40	<0.063	0.136	<0.0083
FOT-EX-4-[080206]-8.0	08/02/06	8.0	NS	<25	<80	<40	<0.059	0.007	<0.0078
FOT-EX-5-[080206]-15.0	08/02/06	15.0	NS	<25	<80	<40	<0.015	0.008	<0.0083
FOT-EX-6-[080206]-3.0	08/02/06	3.0	MS	<25	<80	<40	<0.060	0.007	<0.0080
FOT-EX-7-[080206]-3.0	08/02/06	3.0	SS	<25	<80	<40	<0.054	0.007	<0.0072
FOT-EX-8-[080206]-8.0	08/02/06	8.0	NS	<25	<80	<40	<0.058	0.007	<0.0078
FOT-EX-9-[080206]-6.0	08/02/06	6.0	NS	<25	<80	<40	<0.056	0.007	<0.0075
FOT-EX-10-[080706]-11.5	08/07/06	11.5	--	<25	<80	<40	<0.057	0.007	<0.0076
FOT-EX-11-[080806]-9.0	08/08/06	4.0	--	<25	320	<40	<0.055	0.007	<0.0073
FOT-EX-12-[080306]-6.0	08/03/06	6.0	--	<25	<80	<40	<0.054	0.007	<0.0072
FOT-EX-13-[080306]-13.0	08/03/06	13.0	--	<25	<80	<40	<0.064	0.008	<0.0085
FOT-EX-14-[080306]-9.0	08/03/06	9.0	--	<25	<80	<40	<0.055	0.007	<0.0073
FOT-EX-15-[080706]-11.0	08/07/06	11.0	--	<25	<80	<40	<0.056	0.007	<0.0075
FOT-EX-16-[080706]-8.0	08/07/06	8.0	MS	<25	<80	<40	<0.058	0.008	<0.0078
FOT-EX-17-[080806]-3.0	08/08/06	3.0	NS	<25	<80	<40	0.33	**0.163**	<0.0094
FOT-EX-18-[080806]-7.0	08/08/06	7.0	--	<25	918	<40	<0.052	0.006	<0.0069
FOT-EX-19-[080806]-9.0	08/08/06	9.0	NS	<25	<80	<40	<0.060	0.007	<0.0080
FOT-EX-20-[080806]-7.0	08/08/06	7.0	NS	<25	<80	<40	<0.056	0.014	<0.0075
FOT-EX-21-[080806]-7.0	08/08/06	7.0	NS	<25	516	<40	<0.053	0.006	<0.0071

Sample Identification[2]	Date Sampled	Sample Depth (feet bgs)[3]	Field Screening: Water Sheen	Diesel-Range Hydrocarbons[4] (mg/kg)	Bunker C-Range Hydrocarbons[4] (mg/kg)	Oil-Range Hydrocarbons[4] (mg/kg)	PCBs[5] (mg/kg)	PAHs[6] (mg/kg)	Naphthalene[7] (mg/kg)
FOT-EX-22-[080806]-5.0	08/08/06	5.0	SS	<25	760	<40	<0.054	0.023	<0.0072
FOT-DUP-2-[080806][10]	08/03/06	5.0	--	--	--	--	<0.11	0.007	<0.0072
FOT-EX-23-[080806]-5.0	08/08/06	5.0	NS	<25	<80	<40	<0.053	0.006	<0.0071
FOT-EX-24-[080806]-5.0	08/08/06	5.0	--	<25	<80	<40	<0.052	0.025	<0.0069
FOT-EX-25-[080906]-5.0	08/09/06	5.0	NS	<25	<80	<40	<0.056	0.007	<0.0074
FOT-EX-26-[080906]-5.0	08/09/06	5.0	NS	<25	204	<40	<0.053	0.037	0.0088
FOT-EX-27-[080906]-8.0	08/09/06	8.0	NS	<25	<80	<40	<0.058	0.007	<0.0078
FOT-EX-28-[080906]-8.0	08/09/06	8.0	NS	<25	<80	<40	<0.058	0.007	<0.0078
Former Wood Mill Area Confirmation Samples									
WM-EX-1-[080306]-8.0	08/03/06	8.0	NS	<25	<80	<40	<0.055	0.007	<0.0073
WM-EX-2-[080306]-11.0	08/03/06	11.0	NS	<25	<80	<40	<0.056	0.039	0.010
WM-EX-3-[080306]-10.0	08/03/06	10.0	MS	<25	<80	<40	<0.056	0.014	<0.0075
WM-EX-4-[080406]-13.0	08/04/06	13.0	NS	<25	<80	<40	<0.057	0.007	<0.0077
WM-EX-5-[080406]-16.0	08/04/06	16.0	NS	<25	1,440	<40	<0.057	0.008	0.019
WM-EX-6-[080706]-9.0	08/07/06	9.0	NS	<25	<80	<40	<0.055	0.008	0.014
WM-EX-7-[080706]-8.5	08/07/06	8.5	SS	<25	<80	<40	<0.055	0.049	0.0084
WM-EX-8-[080706]-15.0	08/07/06	15.0	--	<25	<80	<40	<0.055	0.007	<0.0073
WM-EX-9-[080706]-10.0	08/07/06	10.0	--	<25	<80	<40	<0.058	0.007	<0.0078
WM-EX-10-[080806]-16.0	08/08/06	16.0	MS	<25	709	<40	<0.061	**0.488**	0.21
WM-EX-10-[080806]-16.0[11]	08/08/06	16.0	MS	--	--	--	--	**8.51**	--
WM-Dup-1-[080806][12]	08/08/06	16.0	NS	<25	730	<40	<0.057	0.066	0.019
WM-EX-11-[080806]-17.0	08/08/06	17.0	MS	<25	<80	<40	<0.067	0.008	0.023
WM-EX-12-[080806]-8.0	08/08/06	8.0	--	<25	<80	<40	<0.055	0.037	0.017
WM-EX-13-[080806]-9.0	08/08/06	9.0	NS	<25	300	<40	<0.060	0.096	<0.0079
WM-EX-14-[080806]-14.0	08/08/06	14.0	NS	<25	184	<40	<0.056	0.007	<0.0075
WM-EX-15-[080806]-14.0	08/08/06	14.0	SS	<25	<80	<40	<0.057	**0.186**	0.010
WM-EX-16-[080806]-14.0	08/08/06	14.0	NS	<25	<80	<40	<0.055	**0.515**	0.17
WM-EX-17-[080806]-14.0	08/08/06	14.0	NS	<25	<80	<40	<0.056	0.007	0.0096
WM-EX-18-[080906]-9.0	08/09/06	9.0	NS	<25	1,780	<40	<0.055	**0.180**	0.033

Sample Identification[2]	Date Sampled	Sample Depth (feet bgs)[3]	Field Screening: Water Sheen	Diesel-Range Hydrocarbons[4] (mg/kg)	Bunker C-Range Hydrocarbons[4] (mg/kg)	Oil-Range Hydrocarbons[4] (mg/kg)	PCBs[5] (mg/kg)	PAHs[6] (mg/kg)	Naphthalene[7] (mg/kg)
Overexcavated Sample Locations									
FOT-PCS-1-[080206]-11 [8]	08/02/06	11.0	HS	<1,300	**41,000**	<2,000	--	--	--
FOT-EX-10-[080306]-10.5 [8]	08/03/06	10.5	MS	<25	**4,900**	<40	--	--	--
FOT-DUP-1-[080306] [8, 9]	08/03/06	10.5	--	<25	**4,000**	<40	--	--	--
FOT-EX-11-[080306]-8.0 [8]	08/03/06	8.0	HS	<25	**67,000**	<40	--	--	--
WM-EX-11-[080806]-12.0 [8]	08/08/06	12.0	MS	<25	**20,100**	<40	--	--	--
Interim Action Cleanup Levels				2,000	2,000	2,000	0.5	0.14	1,600

Notes:

[1] Chemical analyses by North Creek Analytical in Bothell, Washington, unless otherwise noted.

[2] Approximate sample locations are shown in Figures 3 and 4.

[3] Sample depths are approximate and were recorded as depth beneath local ground surface.

[4] Petroleum hydrocarbons analyzed by Ecology Northwest Method NWTPH-Dx with sulfuric acid/silica gel cleanup. These analyses were completed using a mobile laboratory owned and operated by Libby Environmental, LLC of Lacey, Washington.

[5] Polychlorinated biphenyls analyzed by EPA Method 8082.

[6] Carcinogenic polyaromatic hydrocarbons analyzed by EPA Method 8270C SIM. Refer to Table 3 for individual analyte detections and benzo(a)pyrene TEQ calculations.

[7] Naphthalene analyzed by EPA Method 8270C SIM.

[8] Soil represented by this sample was subsequently overexcavated and removed from the site.

[9] This soil sample is a duplicate of soil sample FOT-EX-10-[080306]-10.5.

[10] This soil sample is a duplicate of soil sample FOT-EX-22-[080806]-5.0.

[11] The results for this sample represent the chemical analysis of cPAHs from a second aliquot obtained from the same set of containers for this sample.

[12] This soil sample is a duplicate of soil sample WM-EX-10-[080806]-16.0.

mg/kg = milligrams per kilogram

NWTPH-Dx = Northwest Total Petroleum Hydrocarbons - Diesel Extended.

NS = no sheen, SS = slight sheen, MS = moderate sheen, HS = heavy sheen

PCBs = polychlorinated biphenyls

cPAHs = carcinogenic polyaromatic hydrocarbons

"--" = not tested

bgs = below ground surface

Shading indicates that the chemical analytical result exceeds the interim action cleanup level

TABLE 3
SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
cPAH DETECTIONS AND TOXICITY EQUIVALENCY CALCULATIONS[1]
RAYONIER PROPERTIES, LLC
PORT ANGELES FORMER MILL SITE
PORT ANGELES, WASHINGTON

FOT-EX-1-[080106]-9.5	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0041	0.1	0.000
Benzo(b)fluoranthene	0.0041	0.1	0.000
Benzo(k)fluoranthene	0.0041	0.1	0.000
Benzo(a)pyrene	0.0041	1.0	0.004
Chrysene	0.0041	0.01	0.000
Dibenzo(a,h)anthracene	0.0041	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0041	0.1	0.000
Total cPAHs			0.007

FOT-EX-2-[080206]-9.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0036	0.1	0.000
Benzo(b)fluoranthene	0.0036	0.1	0.000
Benzo(k)fluoranthene	0.0036	0.1	0.000
Benzo(a)pyrene	0.0036	1.0	0.004
Chrysene	0.0036	0.01	0.000
Dibenzo(a,h)anthracene	0.0036	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0036	0.1	0.000
Total cPAHs			0.007

FOT-EX-3-[080206]-11.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.16	0.1	0.016
Benzo(b)fluoranthene	0.068	0.1	0.007
Benzo(k)fluoranthene	0.011	0.1	0.001
Benzo(a)pyrene	0.10	1.0	0.100
Chrysene	0.31	0.01	0.003
Dibenzo(a,h)anthracene	0.018	0.4	0.007
Indeno(1,2,3-cd)pyrene	0.019	0.1	0.002
Total cPAHs			0.136

FOT-EX-4-[080206]-8.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0039	0.1	0.000
Benzo(b)fluoranthene	0.0039	0.1	0.000
Benzo(k)fluoranthene	0.0039	0.1	0.000
Benzo(a)pyrene	0.0039	1.0	0.004
Chrysene	0.0039	0.01	0.000
Dibenzo(a,h)anthracene	0.0039	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0039	0.1	0.000
Total cPAHs			0.007

FOT-EX-5-[080206]-15.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0043	0.1	0.000
Benzo(b)fluoranthene	0.0043	0.1	0.000
Benzo(k)fluoranthene	0.0043	0.1	0.000
Benzo(a)pyrene	0.0043	1.0	0.004
Chrysene	0.0043	0.01	0.000
Dibenzo(a,h)anthracene	0.0043	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0043	0.1	0.000
Total cPAHs			0.008

FOT-EX-6-[080206]-3.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0040	0.1	0.000
Benzo(b)fluoranthene	0.0040	0.1	0.000
Benzo(k)fluoranthene	0.0040	0.1	0.000
Benzo(a)pyrene	0.0040	1.0	0.004
Chrysene	0.0040	0.01	0.000
Dibenzo(a,h)anthracene	0.0040	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0040	0.1	0.000
Total cPAHs			0.007

FOT-EX-7-[080206]-3.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0036	0.1	0.000
Benzo(b)fluoranthene	0.0036	0.1	0.000
Benzo(k)fluoranthene	0.0036	0.1	0.000
Benzo(a)pyrene	0.0036	1.0	0.004
Chrysene	0.0036	0.01	0.000
Dibenzo(a,h)anthracene	0.0036	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0036	0.1	0.000
Total cPAHs			0.007

FOT-EX-8-[080206]-8.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0039	0.1	0.000
Benzo(b)fluoranthene	0.0039	0.1	0.000
Benzo(k)fluoranthene	0.0039	0.1	0.000
Benzo(a)pyrene	0.0039	1.0	0.004
Chrysene	0.010	0.01	0.000
Dibenzo(a,h)anthracene	0.0039	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0039	0.1	0.000
Total cPAHs			0.007

FOT-EX-9-[080206]-6.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0038	0.1	0.000
Benzo(b)fluoranthene	0.0038	0.1	0.000
Benzo(k)fluoranthene	0.0038	0.1	0.000
Benzo(a)pyrene	0.0038	1.0	0.004
Chrysene	0.0038	0.01	0.000
Dibenzo(a,h)anthracene	0.0038	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0038	0.1	0.000
Total cPAHs			0.007

FOT-EX-10-[080706]-11.5	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0038	0.1	0.000
Benzo(b)fluoranthene	0.0038	0.1	0.000
Benzo(k)fluoranthene	0.0038	0.1	0.000
Benzo(a)pyrene	0.0038	1.0	0.004
Chrysene	0.0038	0.01	0.000
Dibenzo(a,h)anthracene	0.0038	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0038	0.1	0.000
Total cPAHs			0.007

FOT-EX-11-[080806]-9.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0037	0.1	0.000
Benzo(b)fluoranthene	0.0037	0.1	0.000
Benzo(k)fluoranthene	0.0037	0.1	0.000
Benzo(a)pyrene	0.0037	1.0	0.004
Chrysene	0.0037	0.01	0.000
Dibenzo(a,h)anthracene	0.0037	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0037	0.1	0.000
Total cPAHs			0.007

FOT-EX-12-[080306]-6.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0036	0.1	0.000
Benzo(b)fluoranthene	0.0036	0.1	0.000
Benzo(k)fluoranthene	0.0036	0.1	0.000
Benzo(a)pyrene	0.0036	1.0	0.004
Chrysene	0.0036	0.01	0.000
Dibenzo(a,h)anthracene	0.0036	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0036	0.1	0.000
Total cPAHs			0.007

FOT-EX-13-[080306]-13.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0043	0.1	0.000
Benzo(b)fluoranthene	0.0043	0.1	0.000
Benzo(k)fluoranthene	0.0043	0.1	0.000
Benzo(a)pyrene	0.0043	1.0	0.004
Chrysene	0.0094	0.01	0.000
Dibenzo(a,h)anthracene	0.0043	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0043	0.1	0.000
Total cPAHs			0.008

FOT-EX-14-[080306]-9.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0037	0.1	0.000
Benzo(b)fluoranthene	0.0037	0.1	0.000
Benzo(k)fluoranthene	0.0037	0.1	0.000
Benzo(a)pyrene	0.0037	1.0	0.004
Chrysene	0.0037	0.01	0.000
Dibenzo(a,h)anthracene	0.0037	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0037	0.1	0.000
Total cPAHs			0.007

FOT-EX-15-[080706]-11.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0038	0.1	0.000
Benzo(b)fluoranthene	0.0038	0.1	0.000
Benzo(k)fluoranthene	0.0038	0.1	0.000
Benzo(a)pyrene	0.0038	1.0	0.004
Chrysene	0.0038	0.01	0.000
Dibenzo(a,h)anthracene	0.0038	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0038	0.1	0.000
Total cPAHs			0.007

FOT-EX-16-[080706]-8.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0039	0.1	0.000
Benzo(b)fluoranthene	0.0039	0.1	0.000
Benzo(k)fluoranthene	0.0039	0.1	0.000
Benzo(a)pyrene	0.0039	1.0	0.004
Chrysene	0.091	0.01	0.001
Dibenzo(a,h)anthracene	0.0039	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0039	0.1	0.000
Total cPAHs			0.008

FOT-EX-17-[080806]-3.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.11	0.1	0.011
Benzo(b)fluoranthene	0.18	0.1	0.018
Benzo(k)fluoranthene	0.058	0.1	0.006
Benzo(a)pyrene	0.110	1.0	0.110
Chrysene	0.15	0.01	0.002
Dibenzo(a,h)anthracene	0.022	0.4	0.009
Indeno(1,2,3-cd)pyrene	0.083	0.1	0.008
Total cPAHs			0.163

FOT-EX-18-[080806]-7.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0035	0.1	0.000
Benzo(b)fluoranthene	0.0035	0.1	0.000
Benzo(k)fluoranthene	0.0035	0.1	0.000
Benzo(a)pyrene	0.0035	1.0	0.003
Chrysene	0.0035	0.01	0.000
Dibenzo(a,h)anthracene	0.0035	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0035	0.1	0.000
Total cPAHs			0.006

FOT-EX-19-[080806]-9.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0040	0.1	0.000
Benzo(b)fluoranthene	0.0040	0.1	0.000
Benzo(k)fluoranthene	0.0040	0.1	0.000
Benzo(a)pyrene	0.0040	1.0	0.004
Chrysene	0.0040	0.01	0.000
Dibenzo(a,h)anthracene	0.0040	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0040	0.1	0.000
Total cPAHs			0.007

FOT-EX-20-[080806]-7.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0075	0.1	0.001
Benzo(b)fluoranthene	0.0075	0.1	0.001
Benzo(k)fluoranthene	0.0075	0.1	0.001
Benzo(a)pyrene	0.0075	1.0	0.008
Chrysene	0.0075	0.01	0.000
Dibenzo(a,h)anthracene	0.0075	0.4	0.003
Indeno(1,2,3-cd)pyrene	0.0075	0.1	0.001
Total cPAHs			0.014

FOT-EX-21-[080806]-7.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0036	0.1	0.000
Benzo(b)fluoranthene	0.0036	0.1	0.000
Benzo(k)fluoranthene	0.0036	0.1	0.000
Benzo(a)pyrene	0.0036	1.0	0.004
Chrysene	0.0036	0.01	0.000
Dibenzo(a,h)anthracene	0.0036	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0036	0.1	0.000
Total cPAHs			0.006

FOT-EX-22-[080806]-5.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0079	0.1	0.001
Benzo(b)fluoranthene	0.015	0.1	0.002
Benzo(k)fluoranthene	0.0036	0.1	0.000
Benzo(a)pyrene	0.017	1.0	0.017
Chrysene	0.014	0.01	0.000
Dibenzo(a,h)anthracene	0.0036	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.013	0.1	0.001
Total cPAHs			0.023

FOT-DUP-2	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0036	0.1	0.000
Benzo(b)fluoranthene	0.0036	0.1	0.000
Benzo(k)fluoranthene	0.0036	0.1	0.000
Benzo(a)pyrene	0.0036	1.0	0.004
Chrysene	0.0036	0.01	0.000
Dibenzo(a,h)anthracene	0.0036	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0036	0.1	0.000
Total cPAHs			0.007

FOT-EX-23-[080806]-5.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0036	0.1	0.000
Benzo(b)fluoranthene	0.0036	0.1	0.000
Benzo(k)fluoranthene	0.0036	0.1	0.000
Benzo(a)pyrene	0.0036	1.0	0.004
Chrysene	0.0036	0.01	0.000
Dibenzo(a,h)anthracene	0.0036	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0036	0.1	0.000
Total cPAHs			0.006

FOT-EX-24-[080806]-5.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.013	0.1	0.001
Benzo(b)fluoranthene	0.030	0.1	0.003
Benzo(k)fluoranthene	0.0078	0.1	0.001
Benzo(a)pyrene	0.017	1.0	0.017
Chrysene	0.040	0.01	0.000
Dibenzo(a,h)anthracene	0.0035	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.010	0.1	0.001
Total cPAHs			0.025

FOT-EX-25-[080906]-5.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0037	0.1	0.000
Benzo(b)fluoranthene	0.0037	0.1	0.000
Benzo(k)fluoranthene	0.0037	0.1	0.000
Benzo(a)pyrene	0.0037	1.0	0.004
Chrysene	0.0037	0.01	0.000
Dibenzo(a,h)anthracene	0.0037	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0037	0.1	0.000
Total cPAHs			0.007

FOT-EX-26-[080906]-5.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0140	0.1	0.001
Benzo(b)fluoranthene	0.021	0.1	0.002
Benzo(k)fluoranthene	0.0036	0.1	0.000
Benzo(a)pyrene	0.027	1.0	0.027
Chrysene	0.035	0.01	0.000
Dibenzo(a,h)anthracene	0.0089	0.4	0.004
Indeno(1,2,3-cd)pyrene	0.022	0.1	0.002
Total cPAHs			0.037

FOT-EX-27-[080906]-8.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0039	0.1	0.000
Benzo(b)fluoranthene	0.0039	0.1	0.000
Benzo(k)fluoranthene	0.0039	0.1	0.000
Benzo(a)pyrene	0.0039	1.0	0.004
Chrysene	0.0096	0.01	0.000
Dibenzo(a,h)anthracene	0.0039	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0039	0.1	0.000
Total cPAHs			0.007

FOT-EX-28-[080906]-8.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0039	0.1	0.000
Benzo(b)fluoranthene	0.0039	0.1	0.000
Benzo(k)fluoranthene	0.0039	0.1	0.000
Benzo(a)pyrene	0.0039	1.0	0.004
Chrysene	0.0039	0.01	0.000
Dibenzo(a,h)anthracene	0.0039	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0039	0.1	0.000
Total cPAHs			0.007

WM-EX-1-[080306]-8.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0037	0.1	0.000
Benzo(b)fluoranthene	0.0037	0.1	0.000
Benzo(k)fluoranthene	0.0037	0.1	0.000
Benzo(a)pyrene	0.0037	1.0	0.004
Chrysene	0.0037	0.01	0.000
Dibenzo(a,h)anthracene	0.0037	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0037	0.1	0.000
Total cPAHs			0.007

WM-EX-2-[080306]-11.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.031	0.1	0.003
Benzo(b)fluoranthene	0.039	0.1	0.004
Benzo(k)fluoranthene	0.0092	0.1	0.001
Benzo(a)pyrene	0.027	1.0	0.027
Chrysene	0.036	0.01	0.000
Dibenzo(a,h)anthracene	0.0038	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.019	0.1	0.002
Total cPAHs			0.039

WM-EX-3-[080306]-10.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0092	0.1	0.001
Benzo(b)fluoranthene	0.017	0.1	0.002
Benzo(k)fluoranthene	0.0038	0.1	0.000
Benzo(a)pyrene	0.0090	1.0	0.009
Chrysene	0.0038	0.01	0.000
Dibenzo(a,h)anthracene	0.0038	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0038	0.1	0.000
Total cPAHs			0.014

WM-EX-4-[080306]-13.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0039	0.1	0.000
Benzo(b)fluoranthene	0.0039	0.1	0.000
Benzo(k)fluoranthene	0.0039	0.1	0.000
Benzo(a)pyrene	0.0039	1.0	0.004
Chrysene	0.0039	0.01	0.000
Dibenzo(a,h)anthracene	0.0039	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0039	0.1	0.000
Total cPAHs			0.007

WM-EX-5-[080306]-16.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.013	0.1	0.001
Benzo(b)fluoranthene	0.0083	0.1	0.001
Benzo(k)fluoranthene	0.0039	0.1	0.000
Benzo(a)pyrene	0.0039	1.0	0.004
Chrysene	0.0039	0.01	0.000
Dibenzo(a,h)anthracene	0.0039	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0039	0.1	0.000
Total cPAHs			0.008

WM-EX-6-[080706]-9.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.013	0.1	0.001
Benzo(b)fluoranthene	0.0037	0.1	0.000
Benzo(k)fluoranthene	0.0037	0.1	0.000
Benzo(a)pyrene	0.0037	1.0	0.004
Chrysene	0.0100	0.01	0.000
Dibenzo(a,h)anthracene	0.0037	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0037	0.1	0.000
Total cPAHs			0.008

WM-EX-7-[080706]-8.5	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0640	0.1	0.006
Benzo(b)fluoranthene	0.0550	0.1	0.006
Benzo(k)fluoranthene	0.0180	0.1	0.002
Benzo(a)pyrene	0.0310	1.0	0.031
Chrysene	0.0800	0.01	0.001
Dibenzo(a,h)anthracene	0.0037	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0170	0.1	0.002
Total cPAHs			0.049

WM-EX-8-[080706]-15.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0037	0.1	0.000
Benzo(b)fluoranthene	0.0037	0.1	0.000
Benzo(k)fluoranthene	0.0037	0.1	0.000
Benzo(a)pyrene	0.0037	1.0	0.004
Chrysene	0.0037	0.01	0.000
Dibenzo(a,h)anthracene	0.0037	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0037	0.1	0.000
Total cPAHs			0.007

WM-EX-9-[080706]-10.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0039	0.1	0.000
Benzo(b)fluoranthene	0.0039	0.1	0.000
Benzo(k)fluoranthene	0.0039	0.1	0.000
Benzo(a)pyrene	0.0039	1.0	0.004
Chrysene	0.0039	0.01	0.000
Dibenzo(a,h)anthracene	0.0039	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0039	0.1	0.000
Total cPAHs			0.007

WM-EX-10-[080806]-16.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.48	0.1	0.048
Benzo(b)fluoranthene	0.50	0.1	0.050
Benzo(k)fluoranthene	0.18	0.1	0.018
Benzo(a)pyrene	0.33	1.0	0.330
Chrysene	0.39	0.01	0.004
Dibenzo(a,h)anthracene	0.054	0.4	0.022
Indeno(1,2,3-cd)pyrene	0.16	0.1	0.016
Total cPAHs			**0.488**

WM-EX-10-[080806]-16.0 (RERUN)	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	7.40	0.1	0.740
Benzo(b)fluoranthene	9.10	0.1	0.910
Benzo(k)fluoranthene	3.30	0.1	0.330
Benzo(a)pyrene	5.90	1.0	5.900
Chrysene	5.40	0.01	0.054
Dibenzo(a,h)anthracene	0.830	0.4	0.332
Indeno(1,2,3-cd)pyrene	2.40	0.1	0.240
Total cPAHs			**8.506**

WM-DUP-1 (Duplicate of WM-EX-10-[080806]-16.0)	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.05	0.1	0.005
Benzo(b)fluoranthene	0.07	0.1	0.007
Benzo(k)fluoranthene	0.02	0.1	0.002
Benzo(a)pyrene	0.05	1.0	0.047
Chrysene	0.05	0.01	0.000
Dibenzo(a,h)anthracene	0.004	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.03	0.1	0.003
Total cPAHs			0.066

WM-EX-11-[080806]-17.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0045	0.1	0.000
Benzo(b)fluoranthene	0.0045	0.1	0.000
Benzo(k)fluoranthene	0.0045	0.1	0.000
Benzo(a)pyrene	0.0045	1.0	0.004
Chrysene	0.0045	0.01	0.000
Dibenzo(a,h)anthracene	0.0045	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0045	0.1	0.000
Total cPAHs			0.008

WM-EX-12-[080806]-8.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.039	0.1	0.004
Benzo(b)fluoranthene	0.034	0.1	0.003
Benzo(k)fluoranthene	0.0087	0.1	0.001
Benzo(a)pyrene	0.026	1.0	0.026
Chrysene	0.045	0.01	0.000
Dibenzo(a,h)anthracene	0.0037	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.012	0.1	0.001
Total cPAHs			0.037

WM-EX-13-[080806]-9.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.087	0.1	0.009
Benzo(b)fluoranthene	0.082	0.1	0.008
Benzo(k)fluoranthene	0.024	0.1	0.002
Benzo(a)pyrene	0.069	1.0	0.069
Chrysene	0.098	0.01	0.001
Dibenzo(a,h)anthracene	0.010	0.4	0.004
Indeno(1,2,3-cd)pyrene	0.029	0.1	0.003
Total cPAHs			0.096

WM-EX-14-[080806]-14.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0038	0.1	0.000
Benzo(b)fluoranthene	0.0038	0.1	0.000
Benzo(k)fluoranthene	0.0038	0.1	0.000
Benzo(a)pyrene	0.0038	1.0	0.004
Chrysene	0.0038	0.01	0.000
Dibenzo(a,h)anthracene	0.0038	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0038	0.1	0.000
Total cPAHs			0.007

WM-EX-15-[080806]-14.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.17	0.1	0.017
Benzo(b)fluoranthene	0.080	0.1	0.008
Benzo(k)fluoranthene	0.015	0.1	0.002
Benzo(a)pyrene	0.14	1.0	0.140
Chrysene	0.26	0.01	0.003
Dibenzo(a,h)anthracene	0.034	0.4	0.014
Indeno(1,2,3-cd)pyrene	0.034	0.1	0.003
Total cPAHs			**0.186**

WM-EX-16-[080806]-14.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.50	0.1	0.050
Benzo(b)fluoranthene	0.22	0.1	0.022
Benzo(k)fluoranthene	0.034	0.1	0.003
Benzo(a)pyrene	0.39	1.0	0.390
Chrysene	0.84	0.01	0.008
Dibenzo(a,h)anthracene	0.084	0.4	0.034
Indeno(1,2,3-cd)pyrene	0.080	0.1	0.008
Total cPAHs			**0.515**

WM-EX-17-[080806]-14.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0037	0.1	0.000
Benzo(b)fluoranthene	0.0037	0.1	0.000
Benzo(k)fluoranthene	0.0037	0.1	0.000
Benzo(a)pyrene	0.0037	1.0	0.004
Chrysene	0.0037	0.01	0.000
Dibenzo(a,h)anthracene	0.0037	0.4	0.001
Indeno(1,2,3-cd)pyrene	0.0037	0.1	0.000
Total cPAHs			0.007

WM-EX-18-[080906]-9.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.18	0.1	0.018
Benzo(b)fluoranthene	0.12	0.1	0.012
Benzo(k)fluoranthene	0.025	0.1	0.003
Benzo(a)pyrene	0.13	1.0	0.130
Chrysene	0.23	0.01	0.002
Dibenzo(a,h)anthracene	0.026	0.4	0.010
Indeno(1,2,3-cd)pyrene	0.049	0.1	0.005
Total cPAHs			**0.180**

WM-EX-27-[080806]-17.0	Result[2] (mg/kg)	TEF[3]	TEC[4] (mg/kg)
Benzo(a)anthracene	0.0045	0.1	0.000
Benzo(b)fluoranthene	0.0045	0.1	0.000
Benzo(k)fluoranthene	0.0045	0.1	0.000
Benzo(a)pyrene	0.0045	1.0	0.004
Chrysene	0.0045	0.01	0.000
Dibenzo(a,h)anthracene	0.0045	0.4	0.002
Indeno(1,2,3-cd)pyrene	0.0045	0.1	0.000
Total cPAHs			0.008

Notes:

[1] Chemical analyses by Onsite Environmental in Redmond, Washington.

[2]Analytes that are not detected are shown as a value equal to half the detection limit, per MTCA.

[3]TEF = toxicity equivalency factor per WAC 173-340-708(8) based on TEFs presented in California Air Resources Board "Benzo(a)pyrene as a Toxic Air Contaminant," July 1994.

[4]TEC = toxicity equivalent concentration.

Shading indicates total cPAH concentration greater than MTCA Method A cleanup level.

mg/kg = milligrams per kilogram.

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TABLE 4
SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
DIOXIN DETECTIONS AND TOXICITY EQUIVALENCY CALCULATIONS[1]
RAYONIER PROPERTIES, LLC
PORT ANGELES FORMER MILL SITE
PORT ANGELES, WASHINGTON

FOT-EX-10-[080706]-11.5						
Analyte	Laboratory Result (pg/g)	Revised Result[1] (pg/g)	ITEQ		WHO-TEQ	
			TEF	TEQ	TEF	TEQ
2378-TCDD	<1.00	0.5	1	0.5	1	0.5
12378-PeCDD	<5.00	2.5	0.5	1.25	1	2.5
123678-HxCDD	<5.00	2.5	0.1	0.25	0.1	0.25
123478-HxCDD	<5.00	2.5	0.1	0.25	0.1	0.25
123789-HxCDD	<5.00	2.5	0.1	0.25	0.1	0.25
1234678-HpCDD	13.6	13.6	0.01	0.136	0.01	0.136
OCDD	69.2	69.2	0.001	0.0692	0.0001	0.00692
2378-TCDF	<1.00	0.5	0.1	0.05	0.1	0.05
12378-PeCDF	<5.00	2.5	0.05	0.125	0.05	0.125
23478-PeCDF	<5.00	2.5	0.5	1.25	0.5	1.25
123478-HxCDF	<5.00	2.5	0.1	0.25	0.1	0.25
123678-HxCDF	<5.00	2.5	0.1	0.25	0.1	0.25
234678-HxCDF	<5.00	2.5	0.1	0.25	0.1	0.25
123789-HxCDF	<5.00	2.5	0.1	0.25	0.1	0.25
1234678-HpCDF	<5.00	2.5	0.01	0.025	0.01	0.025
1234789-HpCDF	<5.00	2.5	0.01	0.025	0.01	0.025
OCDF	<10.0	5	0.001	0.005	0.0001	0.0005
2,3,7,8-TCDD TEQ (pg/g)				**5.2**		**6.4**

WM-EX-14-[080806]-14.0						
Analyte	Laboratory Result (pg/g)	Revised Result[1] (pg/g)	ITEQ		WHO-TEQ	
			TEF	TEQ	TEF	TEQ
2378-TCDD	<1.00	0.5	1	0.5	1	0.5
12378-PeCDD	<5.00	2.5	0.5	1.25	1	2.5
123678-HxCDD	<5.00	2.5	0.1	0.25	0.1	0.25
123478-HxCDD	<5.00	2.5	0.1	0.25	0.1	0.25
123789-HxCDD	<5.00	2.5	0.1	0.25	0.1	0.25
1234678-HpCDD	<5.00	2.5	0.01	0.025	0.01	0.025
OCDD	40.2	40.2	0.001	0.0402	0.0001	0.00402
2378-TCDF	<1.00	0.5	0.1	0.05	0.1	0.05
12378-PeCDF	<5.00	2.5	0.05	0.125	0.05	0.125
23478-PeCDF	<5.00	2.5	0.5	1.25	0.5	1.25
123478-HxCDF	<5.00	2.5	0.1	0.25	0.1	0.25
123678-HxCDF	<5.00	2.5	0.1	0.25	0.1	0.25
234678-HxCDF	<5.00	2.5	0.1	0.25	0.1	0.25
123789-HxCDF	<5.00	2.5	0.1	0.25	0.1	0.25
1234678-HpCDF	<5.00	2.5	0.01	0.025	0.01	0.025
1234789-HpCDF	<5.00	2.5	0.01	0.025	0.01	0.025
OCDF	<10.0	5	0.001	0.005	0.0001	0.0005
2,3,7,8-TCDD TEQ (pg/g)				**5.0**		**6.3**

Notes:

[1]The revised result reflects the detected laboratory result or one-half of the non-detected laboratory result value.
ITEQ = International Toxic Equivalency Calculation
WHO-TEQ = World Health Organization - Toxic Equivalency Calculation
TEF = Toxicity Equivalency Factor
pg/g = picograms per gram = 10^{-12} grams per gram = parts per trillion