

CLEANUP REPORT OF
CONTAMINATED SOIL EXCAVATIONS -
WRANGELL LUMBER MILL SITE

6.5-Mile Zimovia Highway
Wrangell, Alaska

VOLUME I:
SUMMARY OF RESULTS

January 2013

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CLEANUP REPORT OF
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I. OVERVIEW

The Wrangell Lumber sawmill began operations sometime in the 1960's to early-1970's, and gradually expanded to become one of the largest sawmills in Southeast Alaska (photos on pages B2-B3). The sawmill was shut down by Alaska Pulp Corporation in 1995, but was re-opened by Silver Bay Logging Inc. in 1998. The sawmill operations finally ended in 2007, and by mid-2011 all sawmill buildings and associated equipment had been removed except for the office, shop, fuel depot and 3 storage/warehouse buildings.

A number of environmental cleanup areas at the Wrangell Lumber mill site were identified in a 2011 Phase-II assessment by Nortech Environmental Engineering & Industrial Hygiene Consultants of Juneau AK. On 4/19/12, Southeast Management Services of Juneau AK submitted a cleanup plan that was approved by the Alaska Dept. of Environmental Conservation (ADEC), and excavations began on 5/15/12. More contamination was encountered than expected, and an amended cleanup plan was submitted on 7/13/12. The contaminants of concern for all cleanup areas were identified as diesel range organics (DRO) and residual range organics (RRO). In addition, gasoline range organics (GRO) became a contaminant of concern when a soil sample at the fuel depot excavation exceeded the GRO cleanup level of 1,400 mg/kg.

Contaminated soil excavations occurred over 7 time periods, on 5/15-19/12, 6/4-5/12, 6/29-7/1/12, 7/21-22/12, 8/21-22/12, 9/14-19/12, and 10/24-27/12. Of the eleven environmental cleanup areas involving soil excavations, the following eight were confirmed to meet cleanup levels:

1. Jet-A fuel tank site.
2. Electric generator site.
3. Shop ditch line and sump.
4. Transformer/emergency generator site.
5. Fuel depot site.
6. Oil/water separator pond.
7. Mt. Seley.
8. Cherry picker line.

Snow and winter weather prevented the remaining three cleanup areas from being completed in 2012, but they will be completed as soon as weather permits in the spring of 2013:

1. Green chain/sorter line: Nearly all excavations were completed to cleanup criteria. Only a small 2'-4' deep area with an estimated 3-5 c.y. of contaminated soil in its northwest corner remains to be excavated.

2. City-tie transformer site: This excavation was completed along the back and side of the transformer concrete pad, and all that remains is an estimated 15-30 c.y. of contaminated soil to be excavated immediately below the concrete pad.
3. Log barker area: This very large excavation was nearly completed in late 2012. Three relatively small areas with an estimated 30-60 c.y. still remain to be excavated.

Table I summarizes the contaminated soil volumes from each cleanup area, which have been stockpiled on the Wrangell Lumber mill site. About 3,400 c.y. have been screened to 2"-minus, and most if not all of the remaining approximately 6,000 c.y. will be screened in early spring of 2013. About 40% of the contaminated soil volume is estimated to be removed as oversized rock, and a bioremediation plan for about 6,100 c.y. of screened 2"-minus soil will be submitted for ADEC approval as soon as the remaining excavations are completed this coming spring.

Two cleanup areas involved the identification and disposal of hazardous wastes and used oil at the mill site, all of which were inventoried by Carson Dorn Inc. of Juneau AK on 5/18/12. Three of the 4 drums of hazardous waste were taken to the Wrangell Household Hazardous Waste Collection Event on 5/19/12 for disposal, and the remaining drum was stored for eventual disposal at the 2013 event.

VOLUME I of this report describes all of the 2012 cleanup activity at the Wrangell Lumber mill site, including summaries of each cleanup site excavation, site plan drawings and captioned photos of the excavations. VOLUME II includes all analytical sampling results from the laboratory, Analytical Resources of Tukwila WA.

TABLE 1:
Summary of Wrangell Lumber Contaminated Soil Volumes

Cleanup Area No.	Cleanup Area	Excavation/Activity Dates	Excavated Soil Volumes (c.y.)	Estimated 2"-Minus Soil Volumes (c.y.)	Estimated % Red.
1.	Jet-A Tank	7/1/12	-	-	-
2.	Generator Tank	5/18/12	-	-	-
3.	Transformer/Generator	5/15 - 8/22/12	1,160	870	25%
4.	Shop Ditch Line/Sump	5/27 - 7/21/12	400	300	25%
5.	Fuel Depot	6/29 - 9/16/12	1,090	870	20%
6.	Oil/Water Separator	5/18 - 6/30/12	115	103	10%
7-8.	Hazardous Waste/Used Oil	5/18-19/12	N.A.	N.A.	-
9-10.	Mt. Seley	7/22/12	-	-	-
11.	Green Chain/Sorter Line	6/29 - 10/25/12	860	690	20%
12.	Cherry Picker Line	8/20 - 10/25/12	1,040	855	20%
13.	Log Barker Area	9/14 - 10/27/12	4,660	2,330	50%
14.	City-Tie Transformer	10/26/12	35	32	-
<u>Totals:</u>			<u>9,360</u>	<u>6,050</u>	<u>40%</u>

II. SITE DESCRIPTION

Figure 1 (page A2) shows the City of Wrangell vicinity and the Wrangell Lumber mill site, located 6.5 miles south of the city along the shore of Shoemaker Bay. Figure 2 (page A3) provides a 1990's site plan of the Wrangell Lumber sawmill when it was in full operation. The entire mill site covers about 50 acres, of which 22 acres is paved with asphalt or concrete and drains into a large oil/water separator before discharging to Shoemaker Bay. Also shown on Figure 2 is the closed Mt. Seley woodwaste disposal site immediately north of the mill. Its 7-acre top surface was capped in 1991 with a 10"-18" thick layer of compacted clay and rock that was topped with a 1'-2.5'-thick layer of protective 18"-minus shot rock.

After the sawmill shut down in 2007, the large sawmill building, woodwaste boiler, powerhouse, emergency generator building, lumber processing facilities, planer facility and a large log bundle crane were demolished or removed. Little remains except for their concrete foundations. Figure 3 (page A4) provides a site plan of how the Wrangell Lumber mill site appeared in early May 2012, just prior to the beginning of cleanup excavations. The only buildings remaining were the mill office, equipment repair shop, warehouse, and two storage buildings created out of the former planer facility.

III. BACKGROUND

II.A. Prior Evaluations

On 11/5/06, Nortech Environmental Engineering & Industrial Hygiene Consultants (Nortech) of Juneau AK completed a Phase-I environmental assessment report of the Wrangell Lumber sawmill facilities (Reference Document #1), based on an 8/6/06 site visit. Over 20 buildings were found on the property as shown in Figure 2 (page A3), including a large Berger crane in the sort yard for lifting log bundles out of the water. The Mt. Seley site just north of the mill was being used for storing a substantial amount of logging equipment and empty fuel tanks from the Silver Bay Logging camps that had been shut down. The Nortech report described the following potential environmental concerns:

1. Oil stained soil was found around all fittings and plumbing joints at the mill's main fuel depot, and the fuel depot area would need to undergo site characterization for oil contamination and eventual cleanup action.
2. Numerous housekeeping items involving stored fuel tanks, drums, propane cylinders and lead acid batteries were observed that could become environmental liabilities, and therefore needed to be addressed and disposed of as soon as possible.
3. There was no SPCC plan available at the mill.

The Wrangell Lumber mill shut down in 2007, and many of its buildings were removed by 2011. Nortech then carried out a 9/13-14/11 site evaluation, took soil samples and finalized a Phase-II environmental assessment dated 12/5/11. The report covered all areas described in the Phase-I report and included several additional mill sites. The report concluded that the following areas had contaminated soils exceeding ADEC's Method-2 migration-to-groundwater cleanup criteria

for diesel range organics (DRO, at 230 mg/kg) and/or residual range organics (RRO, at 8,300 mg/kg):¹

1. Office tank area. The empty fuel tank behind the office had been removed, but a sample taken below the former tank's outlet had a DRO level of 404 mg/kg.
2. Generator fuel tank. The soil below the outlet pipe of the large generator fuel tank had a DRO level of 1,420 mg/kg.
3. Fuel tanks at the former generator building site. A soil sample taken along the mill's former emergency generator concrete pad had very high DRO and RRO levels of 51,300 mg/kg and 12,300 mg/kg.
4. Evaporation pond behind the equipment shop. The sediment deposits in the drainage ditch evaporation pond behind the equipment were sampled, and had elevated levels of 3 semivolatiles (SVOC) substances (benzo(a)anthracene, benzo[b]fluoranthene and benzo[a]pyrene).
5. Fuel depot. A soil sample taken from under the diesel tank outlet pipe had a high DRO level of 8,110 mg/kg.
6. Oil/water separator pond. High DRO and RRO levels of up to 3,350 mg/kg and 15,600 mg/kg were found along the sides of the oil/water separator's settling pond.
7. All areas involving storage of petroleum, oils or lubricants. Numerous drums, totes and smaller containers of petroleum, oil, lubricants and other materials were stockpiled along the equipment repair building.
8. Mt. Seley tank storage areas. Two of the 18 test pits made across the top of the adjacent Mt. Seley capped woodwaste fill facility had DRO levels above the DRO migration-to-groundwater cleanup criterion.

On 3/26/12, Tom Hanna of Southeast Management Services inspected the Wrangell Lumber mill facility, and was accompanied by Denise Elston of the Department of Environmental Conservation. The site inspection covered all environmental areas described in the Nortech Phase-II report, and was summarized in the mill site's proposed cleanup plan (Ref. Document #1, page C2).

III.B. ADEC Approvals

Southeast Management submitted the document, *Proposed Soil Cleanup - Wrangell Lumber Mill Site, April 2012* for ADEC's review and approval on 4/9/12 (Ref. Document #1, p. C2). ADEC approved the cleanup plan on 4/30/12 (Ref. Document #2, pp. C3-C7). Once the cleanup excavations began at the Wrangell Lumber mill site, substantially more contaminated soil was found than anticipated. As a result, ADEC sent a 6/26/12 letter to Southeast Management (Ref. Document #4, page C17-C18) that requested an amended cleanup plan. On 6/13/12, Southeast Management submitted the document, *7/12 Amendment to the Cleanup Plan - Wrangell Lumber Mill Site, April 2012* for ADEC's review and approval (Ref. Document #5, p. C19).

ADEC's Denise Elston and Sally Schlichting made a site inspection of the ongoing Wrangell Lumber excavations on 7/20/12. On 9/12/12, ADEC requested additional site sampling and

¹/ A more detailed summary of the Nortech Phase-II site assessment results may be found in the SE Management document entitled, *Proposed Soil Cleanup - Wrangell Lumber Mill Site, April 2012*, submitted 4/9/12 to ADEC for review & approval (Ref. Document #1, page C2).

exploratory excavations of selected areas at the Wrangell Lumber mill site (Ref. Document #7, pp. C20-C21).

IV. CLEANUP AREAS

IV.A. Initial Cleanup Areas

There were 10 cleanup areas listed in the 4/19/12 proposed cleanup plan for the Wrangell Lumber mill site as follows, 8 of which involved soil excavations:

- Area #1: Office Jet-A tank site.
- Area #2: Generator tank site.
- Area #3: Emergency generator/transformer pad site.
- Area #4: Shop drainage ditch & pond.
- Area #5: Fuel depot.
- Area #6: Oil/water separator pond.
- Area #7: Remove recycleable/hazardous materials at Storage Building #1.
- Area #8: Remove/recycle drums, used oil from the shop area.
- Area #9: North end of Mt. Seley, test pit #TP3.
- Area #10: Mt. Seley test pit #TP8.

The first 8 cleanup areas are shown on Figure 4 (page A5), and the last two cleanup areas at the Mt. Seley site can be found on Figure 5 (page A6).

IV.B. 7/12 Amended Plan & New Cleanup Area

As soon as excavations began at the Wrangell Lumber mill site 5/15/12, considerably larger-than-expected volumes of contaminated soil were encountered. The site for stockpiling and bioremediating the excavated soils therefore was moved from the mill's rock quarry to a vacant concrete-surfaced area at the mill site, where there was more room to accommodate the soil volumes. In addition, a new contaminated area was found at the mill site's former green chain/sorter line. The changed stockpile/bioremediation site and new cleanup area were described for ADEC review and approval in the document, *7/12 Amendment to the Cleanup Plan - Wrangell Lumber Mill Site, April 2012* (Ref. Document #5, p. C18):

- Area #11: Green chain/sorter line.

IV.C. Additional 8-9/12 Cleanup Areas

The Wrangell Lumber mill site excavations continued through July and August. On 9/12/12, ADEC requested that sampling and exploratory excavations take place at several additional areas (Ref. Document #6, pp. C20-C21). The exploratory excavations resulted in three more cleanup areas being identified:

- Area #12: Cherry picker line.
- Area #13: City-tie transformer.
- Area #14: Log barker.

IV.D. Stockpile/Bioremediation Area

The original contaminated soil stockpile area was the rock quarry, located across Zimovia Highway from the Wrangell Lumber mill site (ref. [Figure 3](#), page A4). However, it quickly became apparent that the site was inadequate soon after excavations began on 5/14/12. A much larger site was found on a concrete-surfaced portion of the mill site that drained into the nearby oil/water separator pond. [Figure 6](#) (page A7) shows the stockpile area, where the initial 2,600 c.y. of contaminated soils were vibratory-screened to 2"-minus by 7/1/12.

By mid-July, about 3,500 c.y. of screened contaminated had been vibratory-screened and stockpiled near the oil/water separator. 36,000 lbs. of urea and 3,150 lbs. of fertilizer were delivered to the mill site in early-August for biotreating 4,000 c.y. (Ref. Documents #6-#7, pp. C20-C21). However, bioremediation soil treatment did not begin because the contaminated soil excavations continued throughout the remainder of 2012. By the time winter weather prevented further cleanup activity, stockpiles of contaminated soil were located throughout a large portion of the mill area that drained to the oil/water separator (see Photos #151 - #152 (pp. B77-B78)).

V. CLEANUP CRITERIA

Based on the results of Nortech's 2011 Phase-II environmental site assessment, the 4/9/12 Wrangell Lumber mill site's cleanup plan identified the contaminants of concern to be diesel range organics (DRO), residual range organics (RRO), and semivolatle organics (SVOC) for the equipment shop drainage ditch and its evaporation pond. After a high GRO result was found at the fuel depot excavation, GRO and the BETX compounds also were identified as contaminants of concern. The cleanup criteria for the Wrangell Lumber mill site are summarized in [Table 2](#) below, and include selected SVOC compounds.

TABLE 2: Method-2 Health-Related Cleanup Criteria - Wrangell Lumber Mill Site	
a. GRO.....	1,400 mg/kg
b. DRO.....	8,250 mg/kg
c. RRO.....	8,300 mg/kg
d. <i>BETX compounds:</i>	
1. Benzene.....	120 mg/kg
2. Ethylbenzene.....	8,300 mg/kg
3. Toluene.....	17,000 mg/kg
4. Total xylenes.....	166,000 mg/kg
e. <i>Selected SVOC compounds:</i>	
1. Benzo(a)anthracene.....	9,000 ug/kg
2. Benzo(b)fluoranthene.....	9,000 ug/kg
3. Benzo(a)pyrene.....	900 ug/kg
4. Naphthalene.....	1,700 mg/kg
5. Fluorene.....	3,300 mg/kg
6. Pyrene.....	2,500 mg/kg
7. Dibenzofuran.....	170 mg/kg

VI. 5/15-10/27/12 EXCAVATIONS

VI.A. Cleanup Area #1: Jet-A Tank Site (7/1/12)

The Jet-A tank site near the Wrangell Lumber mill office was excavated on 7/1/12, as shown on Figure 4 (page A5). Photos on page B4 show the 4.5'-deep excavation and soil stockpiles. A slight diesel odor was detected in about 2-3 c.y. of the excavated gray-colored soils, which were set aside and sampled to determine if cleanup criteria were met. A somewhat larger pile of discolored soil (about 5-6 c.y.) also was sampled, as was the final excavation.

The DRO and RRO levels in the completed excavation were 11-120 mg/kg and 52-110 mg/kg. The two stockpiles of excavated soil also had similarly low DRO/RRO levels. Consequently the excavation and its stockpiled soil were confirmed to meet the cleanup criteria, and the soil stockpiles were used as backfill to close up the excavation.

VI.B. Cleanup Area #2: Generator Tank Site (5/17/12)

Figure 8 (page A6) shows the generator tank site, and the 6'x14'-long concrete blocks on which the fuel tank had been located. The concrete block on the east end was moved back 30" on 5/17/12, to expose the area affected by the tank's former discharge pipe. After excavating to 12"-18" depths, very little indication of any contamination was found. Two samples were taken (photos on pages B5-B6) and had very low DRO and RRO levels of 160 - 180 mg/kg and 220 - 440 mg/kg. These results easily met the cleanup criteria. As a result, no soils were removed and the site was confirmed to meet cleanup criteria.

VI.C. Cleanup Area #3: Transformer/Generator Site (5/15-6/30/12)

The transformer/generator site excavations began on 5/15/12 and quickly exposed significant contamination (photos on pages B7-B13). The excavations eventually went to 11'-14' depths as shown on Figure 9 (page A10), uncovered numerous pipes and culverts, and about 1,160 c.y. of contaminated soil were removed by the time the site was confirmed to meet cleanup criteria.

Initial excavations on 5/15/12 began in the open 8'-wide space between the concrete foundations for the former emergency generator building and the sawmill transformers.² Very contaminated soil was encountered almost immediately and had high PID readings of 40-200+ ppm. Characteristic sample WS-1, taken at a 4' depth along the south edge of the former emergency generator concrete pad (Photo 10, page B7), had a very high DRO level of 17,000 mg/kg. Portions of the emergency generator concrete pad were removed for better access to the contaminated soil, and later in the day a 15' strip of the transformer concrete surface was removed to expose and excavate the contaminated soil under the previously-observed cracks and weep holes in the concrete.³ The highest DRO/RRO confirmation sample results in the 2'-4' deep excavation (Photo #12, page B8) were 2,900 mg/kg and <400 mg/kg, which met cleanup criteria. However, excavations just 5' to the north went to 10'-11' depths over the following 2 days before cleanup criteria were met (Photos on page B9).

^{2/} Refer to the 3/26/12 photos on page A8 of the report, *Proposed Cleanup Plan - Wrangell Lumber Mill Site, April 2012*,

^{3/} Refer to Photo #16, page A9, in the April 2012 cleanup plan (Ref. Document #1).

By 5/19/12, the excavation extended nearly 100' in an east-west direction and 80' in a north-south direction (photos on pages B10-B12). More than three-fourths of the former emergency generator's 34'x34' concrete slab had to be removed, as well as the 15' strip of the transformer foundation. There appeared to be 4 different sources that created the contaminated conditions at this site:

1. The main contaminant source was the transformer pad's surface water sump drain, located 10' south of the sampling control line's point of origin on Figure 9.⁴
2. A separate contaminant source was located in the southwest portion of the site, about 60' west of the transformer sump drain. DRO-contaminated soil was found within a foot of the surface, and continued down to 12' depths before finally ending.
3. An apparent open-burn area was found along the west side of the emergency generator pad and about 40' west of the transformer sump drain. It had DRO-contaminated soil both above and below the heat-burned soil lens that was found at about an 8' depth (Photo 10, page B7).
4. Leaking 1"-1.5" dia. oil lines were found directly under the northwest corner of the emergency generator concrete pad, which resulted in the 4'-5' deep excavation along the far north portion of the cleanup site.

The transformer/generator site excavations and confirmation sampling were completed by 6/5/12, except for one area directly under the former transformer pad's discharge sump. This 11'-deep site was re-excavated and sampled again on 6/29/12, but samples WS-58 and WS-59 continued to have very high levels of DRO at 12,000-14,000 mg/kg (Photo #19 on page B12). Another re-excavation occurred on 7/21/12 to 11' depths, but one sample still had a DRO level of 8,400 mg/kg that was slightly above the cleanup level of 8,250 mg/kg. On 8/22/12, an additional 4'-6' of soil was removed from either side of a 6'-deep culvert. Once the culvert was broken off, the excavation was extended another 2'-3' under the concrete foundation. Confirmation samples WS-65 & WS-66 had DRO levels of 3,000 mg/kg and 31 mg/kg, which finally met cleanup criteria and completed the transformer/generator cleanup site.

In summary, about 1,160 c.y. of contaminated soil were removed from the transformer/generation cleanup site, screened to 2"-minus and then stockpiled for bioremediation treatment. All samples were evaluated for DRO/RRO, and those results are tabulated on Figure 9. In addition, several samples were evaluated for additional contaminants which are summarized as follows:

1. Sample WS-20 was taken on 5/17/12, about 6' west of the transformer sump drain and at a 9.8' depth. Its DRO/RRO levels were 33,000 mg/kg and 6,000 mg/kg. The sample also was evaluated for
 - A. PCB's. Only one PCB analyte (Aroclor 1260) was detected above the reporting limits. Its level was 0.21 mg/kg (Vol. II, p. E20), which met ADEC's cleanup criterion of 1 ppm.
 - B. GRO, BETX. All GRO and BETX results were nondetect (Vol. II, page E34).
 - C. SVOC's. Nine of the semi-volatile organic compounds (SVOC) were detected above the reporting limit, at levels ranging from 0.88 mg/kg to 8.3 mg/kg (Vol. II, page E27). All results were well under the ADEC cleanup criteria for each compound.
2. Sample WS-48 was taken on 6/5/12, directly below the transformer sump drain and at a 9.5' depth. Its DRO/RRO levels were 11,000 mg/kg and 800 mg/kg. It also was evaluated for SVOC's, and 2 compounds were detected (Vol. II, page 76). Their levels

⁴/ Refer also to Photos #13-#15, pages A8-A9 of April 2012 cleanup plan (Ref. Document #1).

were very low and well under their respective ADEC cleanup limits, ranging from 0.36 mg/kg to 1.2 mg/kg.

3. Sample WS-54 was taken on 6/5/12, 60' west of the transformer sump drain and at a 9.5' depth. Its DRO/RRO levels were 29 mg/kg and 21 mg/kg. It also was evaluated for SVOC's, and 7 compounds were detected (Vol. II, page E86). Their levels all were very low and just slightly above the respective reporting limits, ranging from .0056 mg/kg to 0.010 mg/kg.

VI.D. Cleanup Area #4: Shop Ditch Line & Sump (5/19-7/1/12)

Excavations of the Wrangell Lumber mill's shop drainage ditch and sump (photos on page B14) began soon after 5/19/12 and ended on 7/21/12 as shown on Figure 10 (page A11).

By 6/4/12, the sump's sediment deposits had been excavated to about a 2' depth. Contaminated soil also had been removed throughout the 254'-long ditch line (Photos on page B15), including from along and under the edge of the adjacent asphalt. Confirmation samples throughout the sump and ditch line had low DRO/RRO levels of 28-1,400 mg/kg and 110 - 1,300 mg/kg, which met the cleanup criteria.

Excavations of the ditch line's ponded area behind the equipment shop started on 6/4/12. As the alders were being cleared from along the upper embankment (Photo #27, page B16), pieces of a shattered battery were found and carefully removed. The soils around the battery pieces had no discoloration or indications of contamination, but as a precaution the 6"-8" of soil around the two largest battery pieces were removed with the battery pieces and placed into an overpack drum for disposal or recycling.

Excavations of the shop's ponded area on 6/4/12 exposed very smelly contaminated soil. Characteristic samples SD-8 & SD-9 had RRO levels of 10,000-14,000 mg/kg, and excavations resumed on 6/30/12. High RRO levels continued to be encountered at 8,600-42,000 mg/kg. By the end of 7/1/12, the upper end of the ponded area had been excavated to 4' depths and its confirmation samples all met the cleanup criteria for DRO and RRO (Photo #29, page B17).

Excavations of the lower end of the shop's ponded area were completed on 7/21/12, reaching clean clay soil at 3'-4' depths. The final excavation ended up being about 20' wide and 70' long (photos on pages B17-B18). All confirmation samples met the cleanup criteria, thereby completing the shop ditch line & sump cleanup area.

In summary, about 400 c.y. of contaminated soil were excavated from the shop ditch line/sump cleanup area, stockpiled and vibratory-screened to 2"-minus for eventual bioremediation treatment. All samples were evaluated for DRO and RRO, and their results are tabulated on Figure 10.

Sample SD-3 also was evaluated for SVOC's. It was taken on 6/4/12, at a 13" depth along the northeast corner of the cleaned ditch line sump. Its DRO/RRO levels were 110 mg/kg and 360 mg/kg. Eleven SVOC compounds were detected (Vol. II, page E75), but their levels all were very low and just slightly above the respective reporting limits, ranging from .0052 mg/kg to 0.024 mg/kg.

VI.E. Cleanup Area #5: Fuel Depot (6/4-9/16/12)

Excavations at the Wrangell Lumber mill's fuel depot began on 6/4/12 (photos on pages B19-B20). Considerable diesel-contaminated soil was found starting at about a 2.5' depth under where the diesel tank's discharge pipe had been located. The fuel depot's wood bulkhead was removed by the end of the day except for its vertical support piles, and contaminated soil was excavated to about 2.5' below the concrete pavement surface before clean-appearing soil began to appear (Photo #35, page B20).

As the excavations continued to about where the gasoline tanks had been located, high PID readings of 150-300 ppm unexpectedly were encountered at a depth of 4'-5' beneath the concrete surface level (Photo #37, page B21). Characterization sample FD-1 had a GRO level of 1,500 mg/kg which was slightly over the cleanup criterion of 1,400 mg/kg. As a result, GRO and BETX compounds were added to the contaminants of concern for the cleanup area.

Figure 11 (page A12) shows the fuel depot excavation status on 6/29/12 (see also Photo #38, page B21), when numerous soil samples confirmed high DRO levels of 8,400-15,000 mg/kg in a 3'-4' thick layer of gaseous gravelly/sandy soil (PID levels of 80-150+ ppm). The contaminated layer began in about the middle of the excavation site at a 4.5' depth, where sample FD-11 was taken. It then sloped to an 8' depth at the excavation's west end (photos on page B22). Sampling also showed that the excavation's south embankment met the DRO cleanup level, including where sample FD-24 was taken directly in the gaseous soil layer and had a DRO level of 5,700 mg/kg (Photo #41, page B23).

The fuel depot excavation resumed on 7/21/12, and by the end of the day reached clean soils across the entire excavation bottom at 7'-8' depths. All remaining portions of the bulkhead concrete retainer walls along the west end had been removed as well (Photo #42, page B23). On 7/22/12, the fuel depot excavation was extended 30' westward as shown in Photo #43 (page B24), completely removing the fuel depot bulkhead area's soil to a 10' depth. The excavation's northwest corner also was extended 10' to the north (Photo #44, page B24).

The 7/22/12 confirmation sampling results are provided on Figure 12 (page A13). The entire excavation bottom and its embankments met the cleanup criteria for GRO/RRO/RRO, except for sample FD-37 along the excavation's northwest corner. Because it had a DRO level of 8,500 mg/kg (Photo #45, page B25), additional excavations took place on 8/22/12 as shown on Figure 13 (page A14). The northwest embankment wall was excavated 8' westward to 11'-12' depths, and a 1'-3' soil layer was removed from the excavation bottom of the northwest corner. Sampling on 8/22/12 confirmed that all areas in the northwest corner met cleanup criteria, except for sample FD-48 at the base of the west embankment wall (Photo #46, page B25). Its DRO level was 13,000 mg/kg at a depth of 10.5', but its GRO, BETX and RRO results all met cleanup criteria.

The final fuel depot excavation took place on 9/16/12, when an additional 10'-15' width of concrete surface was laboriously broken off and removed. The newly exposed portion of the west embankment was excavated to 12' depths, completely exposing a 12"-dia ductile iron pipe that had been buried at a 6' depth (photos on page B26). Final sampling took place along the base of the embankment, within the 3'-4' thick layer of gaseous gravels which continued to have high PID levels above 100 ppm (Photo #49, page B27). However, the DRO levels were 3,900 - 4,400 mg/kg, which finally were below the cleanup criterion of 8,250 mg/kg.

As a result of the 9/16/12 confirmation sampling, the entire fuel depot excavation site was confirmed to meet all cleanup criteria:

- A. Only one sample (characterization sample FD-1) during the entire fuel depot excavation exceeded the GRO cleanup criterion.
- B. All BETX levels either were below the laboratory's reporting limits (RL) or very low as shown in Table 3 below.
- C. RRO levels typically were very low and did not come close to exceeding the cleanup level of 8,300 mg/kg.
- D. At the request of ADEC, SVOC's were evaluated for one sample (FD-54). Six SVOC compounds were detected (Vol. II, page E474), but their levels all were very low and just slightly above the respective reporting limits, ranging from 0.060 mg/kg to 0.31 mg/kg. RCRA-metals also were evaluated, and only two metals were detected above their reporting limits at very low values (Vol. II, page E481).

**TABLE 3: Summary of
GRO/BETX Results - Fuel Depot Excavation**

Sample No.	Sampling Date	GRO	Sampling Results (mg/kg)			
			Benzene	Toluene	Ethybenzene	Xylenes
FD-1	6/5/12	1,500	< RL*	< RL	1.2	0.25
FD-2	"	< RL	< RL	< RL	< RL	< RL
FD-3	6/29/12	330	< RL	< RL	1.8	5
FD-4	"	< RL	< RL	< RL	< RL	< RL
FD-5	"	28	< RL	< RL	< RL	< RL
FD-10	"	< RL	< RL	< RL	0.07	0.03
FD-19	"	350	< RL	< RL	0.28	20.7
FD-20	"	21	< RL	< RL	< RL	< RL
FD-21	"	6	< RL	< RL	< RL	< RL
FD-22	"	300	< RL	< RL	< RL	< RL
FD-24	"	< RL	< RL	< RL	< RL	< RL
FD-29	7/22/12	270	< RL	< RL	2.4	< RL
FD-30	"	330	< RL	< RL	3.3	3.7
FD-31dup	"	42	< RL	< RL	0.03	1.2
FD-32	"	4	< RL	< RL	0.02	< RL
FD-33	"	< RL	< RL	< RL	< RL	< RL
FD-34	"	49	< RL	< RL	0.40	1.8
FD-35	"	190	< RL	< RL	1.8	< RL
FD-36	"	9	< RL	0.02	0.05	< RL
FD-37	"	210	< RL	0.08	3.6	8.2
FD-38	"	< RL	< RL	< RL	< RL	< RL
FD-39	"	120	< RL	< RL	1.0	< RL
FD-47	9/16/12	9	< RL	< RL	< RL	< RL
FD-48	"	220	< RL	< RL	4.5	5.0
FD-49	"	360	< RL	< RL	3.5	3.7
FD-50	"	51	< RL	< RL	0.40	0.25

* "RL" means the laboratory's "Reporting Limit"

VI.F. Cleanup Area #6: Oil/Water Separator Pond (5/18-7/1/12)

Excavations at the oil/water separator pond began on 5/18/12, with the removal of all alder growth around the pond sides (Photos #50-#52, pages B27-B28). The south embankment then was smoothed as the contaminated soils along the waterline were methodically excavated (photos on page B29). The sediment deposits in the back end of the pond were excavated to 1'-2' depths, after which the north embankment's waterline area was excavated. Sampling on 6/5/12 showed that the south embankment met the DRO/RRO cleanup criteria, but the north bank's RRO levels were 8,500-13,000 mg/kg. Additional excavations along the north embankment took place on 6/29/12 (photos on page B30). Confirmation sampling resulted in much lower RRO levels along the north embankment of 130 - 3,600 mg/kg, which met the ADEC cleanup level of 8,300 mg/kg.

DRO levels for all confirmation samples were 25 - 750 mg/kg, which met the ADEC cleanup level of 8,250 mg/kg and completed the oil/water separator excavations. An estimated 115 c.y. of contaminated soil and sediment were removed and stockpiled for eventual bioremediation treatment.

SVOC's were evaluated for one sample (OWS-10), and 3 compounds were detected (Vol. II, page E473). Their levels all were very low and just slightly above the respective reporting limits, ranging from .057 mg/kg to 0.068 mg/kg. RCRA-metals also were evaluated, and 5 metals were detected above their reporting limits at very low values (Vol. II, page E478).

VI.G. Cleanup Areas #7-8: Hazardous & Other Materials, Used Oil (4/18-5/19/12)

On 5/18/12, Steve Haavig from Carson Dorn, Inc. of Juneau AK inspected and inventoried the Wrangell Lumber mill's used oil, hazardous waste and excess maintenance materials that were stored in various containers and drums (Ref. Document #3, pages C8-C15). The oil in the mill's 4,000-gallon used oil tank was found to meet the used oil burning specifications, and subsequently was used locally as fuel for energy recovery. On 5/19/12, eight of the nine drums containing hazardous wastes were taken to the Wrangell Household Hazardous Waste Collection Event and consolidated into four drums for disposal. The one remaining drum was about half filled with dried green paint and rags, and will be taken to the 2013 Wrangell Household Hazardous Waste Collection Event for disposal.⁵

VI.H. Cleanup Areas #9-#10: Mt. Seley (7/22/12)

Excavations at the two potentially contaminated sites on the capped Mt. Seley woodwaste disposal facility took place on the afternoon of 7/22/12.

The first excavation removed nearly the entire 32"-thick clay/rock cap where Nortech's test pit #TP3 was made (photos on page B32). The 16'x12'-15' wide excavation is shown on Figure 15 (page A16). In spite of the excavation exposing fresh underlying sawdust & wood chips along its west side, no indications of any contaminated soil was found. Two soil samples were taken, and had DRO/RRO levels of 220 - 1,100 mg/kg and 320 - 480 mg/kg. As a result, no soil was removed for bioremediation, and the site was concluded to meet the cleanup criteria.

^{5/} Note: Only 4 drums of hazardous wastes can be accepted at the household hazardous waste collection event per year from a "Conditionally Exempt Small Quantity Generator" such as the Wrangell Lumber mill. Unfortunately the contents of the mill's last drum of hazardous waste could not be fit into the 4-drum limit and therefore was stored for disposal in the spring of 2013.

The second excavation on the capped Mt. Seley woodwaste disposal cap occurred where Nortech's test pit #TP8 was located. Because there were two excavation sites in close proximity and only one had been shown in the Nortech report, measurements were made to the Nortech test pit #TP14 to better identify which site was #TP8. In any event, both sites were excavated as shown on Figure 15. No indications of any contamination were found in either of the two 12'x8'x1'-1.5' deep excavations (photos on page B33). The confirmation samples MS-3 & MS-4 had very low DRO/RRO levels of 11 - 29 mg/kg and 30 - 130 mg/kg. Consequently no soil was removed for bioremediation, and the sites were concluded to meet the cleanup criteria.

VI.I. Cleanup Area #11: Green Chain/Sorter Line (6/30-10/25/12/12)

Black-stained surface sawdust and gravels were noticed in the former green chain line area on 5/19/12, and exploratory sampling on 6/5/12 found high DRO/RRO levels of 5,500 - 11,000 mg/kg and 15,000 - 25,000 mg/kg (photos on page B34).

Excavations of contaminated soil began on 6/29/12, where the original samples had been taken. A long 4'-wide concrete foundation structure was uncovered, and 2'-4' deep excavations were made along both sides of the foundation (Photo #65, page B35) until clean-appearing soils were found at 2'-4' depths. The foundations eventually were identified as associated with the former sawmill's sorter line, which paralleled the green chain line on its east side.

Excavations continued through much of the following day on 6/30/12, extending 150' south of the original starting point until no further contaminated soil was found in that direction. Excavations also continued to the northeast, where greasy-blue contaminated soil was excavated from around the north end of the concrete foundation (Photos #66-#67, pages B35-B36). By the end of the day, the 10'x10'x18"-thick concrete block in the foundation's northwest corner was completely exposed and sampling took place throughout the excavation (Photos #68-#70, pages B36-B37).⁶ Sampling results are shown on Figure 16 (page A17), and two areas of contaminated soil remained above cleanup criteria:

- A. A 45'x15' area in the middle portion of the sorter foundation structure was excavated to 1'-1.5' depths, but samples GC-34 & GC-36 still had high RRO levels of 8,500-10,000 mg/kg which were over the cleanup criterion of 8,300 mg/kg.
- B. A much larger area of about 60'x40' on the north end of the excavation had high levels of both DRO and RRO. In particular, sample GC-17 at a 20" depth along the west edge of the concrete foundation had DRO/RRO levels of 21,000 mg/kg and 48,000 mg/kg. Also, sample GC-23 at a 5' depth in the northeast corner of the excavation had high DRO/RRO levels of 21,000 mg/kg and 48,000 mg/kg.

Excavations on the green chain/sorter line resumed on 7/20/12, when ADEC's Denise Elston and Sally Schlichting inspected the cleanup progress and excavation sites (Photo #71, page B38). Substantial excavations then continued into the following day, followed by confirmation sampling as shown on Figure 17 (page A18):

- A. An additional 1'-2' layer of soil was taken out of the middle portion of the sorter foundation structure. Confirmation samples GC-48dup through GC-52 all met cleanup criteria, with DRO/RRO levels of 38-3,000 mg/kg and 60-6,400 mg/kg.

⁶ The 10'x10'x18"-thick concrete foundation block was identified by Wrangell personnel to be where the mill's former hydraulic power "action-pack" unit for the 150'-long lumber-sorting line had been located. The power-pack unit provided the entire sorter line with hydraulic fluid, and apparently was installed in the mid-1960's when the sawmill building was constructed. Dick Bueller of Silver Bay Logging and the Wrangell mill personnel indicated that the sorter line could not be made to work when Silver Bay Logging took over the mill in 1998, and therefore was never used by Silver Bay Logging.

- B. 25' of the concrete foundation's north end was completely removed, and excavations went to 8-9' throughout much of a 30'x40' area. Cleanup criteria were met in the excavation's far northeast corner (Photo #72, page B38), but contaminated soil still remained
1. In the excavation's northwest corner where (a) sample GC-43 at an 8.5' depth had a RRO level of 8,500 mg/kg, and (b) sample GC-47 along the embankment had very high DRO/RRO levels of 15,000 mg/kg and 56,000 mg/kg (Photo #73, page B39).
 2. Near the broken north end of the sorter foundation, where sample GC-60 at a 4.5' depth had high DRO/RRO levels of 8,500 mg/kg and 13,000 mg/kg (Photo #74, page B39).

Another excavation took place on 8/20/12 in the north end of the green chain/sorter line cleanup site, removing contaminated soil in two areas as shown on Figure 18 (page A19) with the following results:

- A. A 1'-1.5' deep excavation was made across the bottom of the northwest corner, where samples GC-66 and GC-67 met cleanup levels with DRO/RRO levels of 8 - 27 mg/kg and 21 - 49 mg/kg (Photo #75, page B40).
- B. A 2'-wide by 20'-long length of the excavation's northwest embankment was excavated to a 3'-4' depth from under the mill's concrete surface. However, sample GC-65 at a 2.5' depth still had a high RRO level of 9,700 mg/kg, which exceeded its cleanup criterion of 8,300 mg/kg.
- C. A 2.5' excavation was made just north of the broken end of the sorter foundation, covering an area of about 20'x18'. However, samples GC-68 and GC-69 at 6' depths still had high DRO/RRO levels of 8,600 - 11,000 mg/kg and 12,000 - 15,000 mg/kg (Photo #76, page B40).

The last two excavations took place at the green chain/sorter line as shown on Figure 19 (page A20), first on 9/15/12 and then followed on 10/25/12:

- A. The 9/15/12 excavation removed an additional 2'-3' of contaminated soil from the area just north of the broken end of the sorter foundation (Photo #77, page B41). While 3 out of the 4 confirmation met cleanup criteria, GC-73 along the southwest corner still had a high RRO level of 12,000 mg/kg.

Excavations also occurred on the northwest embankment, where about 5' of the concrete surface was broken off and a 20' strip of embankment was excavated to a 3' depth. However, samples GC-70/71dup continued to have high DRO/RRO levels of 11,000 mg/kg and 18,000 mg/kg.

- B. The 10/25/12 excavation removed 2'-3' of contaminated soil over a 20'x14' area just in front of the broken sorter foundation, ending at 10'-11' depths. All confirmation samples along the excavation's bottom and embankment now met cleanup criteria (highest DRO/RRO levels were for sample GC-77, at 1,700 mg/kg and 4,500 mg/kg), thereby closing out this portion of the green chain/sorter line excavation.

The 10/25/12 excavation also removed an additional 3' of the mill's concrete surface in the northwest corner, and the underlying embankment soil was removed to 3'-4' depths along a 30' length (photos on page B43). Two of the three confirmation samples at 2.5'-3' depths met the DRO and RRO cleanup levels. However, samples GC-82/84dup continued to have very high RRO levels of 16,000 - 18,000 mg/kg which exceeded the cleanup level of 8,300 mg/kg.

In summary, about 860 c.y. of contaminated soil were removed from the green chain/sorter line cleanup site and stockpiled for eventual bioremediation treatment. Except for a small area along the northwest corner embankment, the entire cleanup site was confirmed to meet the DRO and RRO cleanup criteria. The northwest corner embankment's remaining contaminated soil, estimated to be 3-5 c.y., will be excavated in early spring of 2013 as soon as weather allows.

SVOC's were evaluated for one sample (GC-38, taken 7/20/12 with DRO/RRO levels of 7,100 mg/kg and 10,000 mg/kg), and 3 compounds were detected (Vol. II, page E182). Their levels all were very low and just barely above their respective reporting limits, ranging from .014 mg/kg to 0.037 mg/kg.

VI.J. Cleanup Area #12: Cherry Picker Line (7/22 - 10/25/12)

Black-stained surface sawdust and gravels were noticed along the former cherry picker line area on 7/1/12, and shallow hand-dug excavations confirmed the presence of contaminated soil that needed to be excavated. The former cherry picker line is shown on Figure 4 (page A5). It consisted of four hydraulically operated 'cherry picker' cranes on concrete blocks, which removed and sorted sawn lumber from a long chain grate that came out of the sawmill building.

Excavations began on 8/20/12, after vegetation and debris were removed from the 25'-30' wide un-concreted area where the cherry picker chain grate had been located. Excavations began at the former cherry picker line's south end, initially going to 1'-2' depths and then dropping to a 4' depth about 50' from its south end (photos on page B45). Characteristic sample CP-7 was taken about 45' from the south end at a 1' depth, and had a high DRO level of 26,000 mg/kg (Photo #87, page B46).

Excavations continued through 7/21/12, with depths varying between 2'-5.5' before clean appearing soil was reached. Characteristic sample CP-19 was taken 2' deep along the west side of the excavation and 145' from the beginning (Photo #90, page B47), and had high DRO/RRO levels of 14,000 mg/kg and 8,700 mg/kg. By late-7/22/12, the excavations had reached the north end of the former cherry picker line (photos on page B48), and confirmation samples were completed throughout the 188'-long excavation as shown on Figure 20 (page A21). The DRO/RRO cleanup criteria were met throughout most of the excavation, except for the four areas described below:

- A. The 1.7'-deep sample CP-2 in the excavation's southeast corner had a high DRO level of 12,000 mg/kg, which was over the cleanup criterion of 8,250 mg/kg.
- B. The 4'-deep samples CP-8 and CP-11dup, taken 35' from the excavation's south end, had high DRO levels of 9,300 - 10,000 mg/kg. An area of about 20'x15' was estimated to need further excavation.
- C. Sample CP-27, taken 3' under the northern-most concrete block about 150' from the south end, had a very high DRO level of 19,000 mg/kg.
- D. Sample CP-17 was taken 2.2' under a concrete block along the east side of the excavation and about 120' from the south end. It had a high RRO level of 13,000 mg/kg. In addition, characteristic samples CP-39 and CP-40 along the northeast corner had high DRO levels of 12,000 - 20,000 mg/kg. Sample CP-38 in the northeast corner also had a high DRO level of 8,100 mg/kg which was just barely under the cleanup criteria of 8,250 mg/kg.

Excavations continued at the former cherry picker line on 9/16/12. The northeast and northwest portions of the site were substantially enlarged as shown on Figure 21 (page A22), and all of its confirmation samples met the DRO/RRO cleanup criteria (Photos #93-#95, pages B49-B50). Excavations also occurred in the south area of the site as described below, which needed a final excavation on 10/26/12 before full compliance was confirmed:

- A. Ten feet of concrete surface and its underlying 2'- thick layer of contaminated soil were removed in the southeast corner, but samples CP-63 and CP-65 continued to have high DRO levels of 9,700-12,000 mg/kg. On 10/26/12, an additional 10'x8'x2'-2.5' deep area was excavated (Photo #99, page B52), and cleanup criteria were met when samples CP-70 and CP-71 had DRO levels of 890 - 3,800 mg/kg.
- B. On 9/16/12, a 2'-3' thick layer of contaminated soil was removed between 10' and 38' from the south end of the cherry picker excavation (Photo #96, page B50). All samples along the bottom of the excavation met the cleanup criteria for DRO and RRO. However, contaminated sandy soil still remained along its west embankment, and characteristic sample CP-42 had high DRO/RRO levels of 9,100 mg/kg and 9,200 mg/kg.

On 10/26/12, the concrete surface layer was broken back about 12' and the newly exposed embankment soil was excavated along a 20' length to 6' depths (photos on page B51). Confirmation samples CP-66 through CP-69 had DRO/RRO levels of 870 - 3,300 mg/kg and 170 - 6,200 mg/kg, which met the cleanup criteria and finally completed the former cherry picker line excavation.

In summary, about 1,040 c.y. of contaminated soil were removed from the former cherry picker line excavation, and stockpiled for eventual bioremediation. SVOC's were evaluated for sample CP-20 (its DRO/RRO levels were 26,000 mg/kg and 4,200 mg/kg), and only one SVOC compound was detected (Vol. II, page E258). Its level of 0.058 mg/kg was just slightly above the reporting limit. RCRA-metals also were evaluated, and 5 metals were detected above their reporting limits at very low values (Vol. II, page E272).

VI.K. Cleanup Area #13: City-Tie Transformer Site (10/26/12)

The Wrangell Lumber mill's former city-tie transformer site was evaluated for potential oil-contaminated soil on 9/15/12, as a result of ADEC's 9/12/12 request (Ref. Document #8, pages C22-C23). Figure 22 (page A23) provides a site plan of the former city-tie transformer area, showing its 14.5'x14' concrete foundation block still in place along a steep embankment below the mill's former parking area (Photo #100, page B52). Four 8"-12" deep soil samples were taken around the periphery of the concrete block (Photos on page B53):

- A. Sample T-4 on the downslope side of the transformer pad had very low DRO/RRO levels of 190 mg/kg and 200 mg/kg.
- B. The 2 upslope samples T-1 and T-2 had DRO levels of 8,300-19,000 mg/kg which were above the cleanup level of 8,250 mg/kg. The upslope surface water drainage appeared to go around the south side of the transformer pad, where sample T-3 (Photo #103, page B54) had the highest DRO level of 33,000 mg/kg. Its RRO level also was high at 8,200 mg/kg, but just below its cleanup criterion of 8,300 mg/kg.

Excavations at the former city-tie transformer site took place on 10/26/12, and are shown on Figure 23 (page A24). A small backhoe was used to gain access onto the concrete pad and work around the adjacent electrical poles. It was able to excavate contaminated soil from along the

south side and immediately downslope of the transformer pad. Gray-blue contaminated soil was removed to a 5' depth below the transformer pad's top surface, where clean muskeg soil was reached (Photos #104-#105, pages B54-B55). Characteristic sample T-6 was taken about 5' downslope of the concrete pad and at about a 1.5' depth within the contaminated soil layer. It had a high DRO level of 14,000 mg/kg (its RRO level was 1,300 mg/kg). However, sample T-9 taken just 1.5' lower in clean-appearing muskeg had very low DRO/RRO levels of 190 mg/kg and 200 mg/kg (Photo #106, page B55).

The contaminated soil was hand-excavated to several feet under the south side of the transformer pad, after which the large backhoe proceeded to excavate along the entire back of the transformer pad for about 10' upslope, removing any potentially contaminated soil and exposing clean-appearing muskeg along the entire excavation bottom (Photos #107-#109, pages B56-B57). Low DRO/RRO levels of <6 - 870 mg/kg and <11 - 200 mg/kg were found throughout the upslope excavation area.

Samples T-7 and T-8 along the bottom of the south-side excavation had DRO levels of 3,700 - 5,500 mg/kg, and met the cleanup criterion of 8,250 mg/kg. Samples T-11dup and T-13 were taken in the residual gray-blue soil directly under the southeast corner of the concrete pad (Photo #108, page B56). Their DRO levels of 1,400 - 2,100 mg/kg also met the cleanup criterion of 8,250 mg/kg.

About 35 c.y. of contaminated soil were excavated from the city-tie transformer pad site and stockpiled for eventual bioremediation treatment. Sample T-5 was evaluated for PCB's, and two analytes (Aroclor 1254 and Aroclor 1260) were detected at 0.032 mg/kg and 0.066 mg/kg, which met the ADEC cleanup level of 1 mg/kg.

In summary, cleanup criteria were met throughout the upslope and south-side areas of the city-tie transformer excavation. However, about 15-30 c.y. of contaminated soils still remain below the transformer pad's south side as shown in Figure 23, and excavations will take place as soon as weather allows in the spring of 2013.

VI.L. Cleanup Area #14: Barker Area (9/14-10/27/12)

The Wrangell Lumber mill's former log barker area is located along the northwest corner of the Wrangell Lumber mill site, as shown on Figure 4 (page A5). Photo #2 (page B3) shows the log barker area on 9/24/93 when the sawmill operating. Logs were placed onto elevated transfer conveyors from two earth-filled ramps. The logs would go to either a 60' barker or a smaller 27' barker, where the bark would be mechanically stripped off the logs. The peeled logs then would enter the sawmill through two 300'-long elevated conveyors. Both conveyors had a 100'-long concrete structure underneath, where logs could be 'kicked' off whenever the sawmill couldn't handle the volume of incoming logs. A log chipper unit just after the 27' barker was located along the north conveyor. A bark-removal conveyor system with a loadout hopper was along the south conveyor for handling the large quantities of bark wastes that were generated.

All equipment and conveyors were removed from the barker area by 2012, leaving only the two earth-filled log-loading ramps with their concrete bulkheads, and the concreted surface where the barker buildings had been located.

The log barker area was inspected on 8/20/12, and an area of surface oil staining was observed along the front of the main 10'-high log-loading ramp (photos on page B63). Two exploratory excavations took place in front of the ramp's concrete bulkhead on the morning of 9/14/12, but

no significant signs of contamination were found in the 2'-3' excavations. Samples B-3 and B-4 were taken and had DRO/RRO levels of 560-1,300 mg/kg and 1,500-2,500 mg/kg, which met cleanup criteria.

9/14/12 exploratory excavations also occurred in a 15'-wide by about 50'-long un-concreted surface that had been under the south log conveyor, starting about 20' in front of the 60' barker building site. Contaminated soil was found almost immediately within 1' of the surface (photos on page B65). Characteristic sample B-1 was taken at a 2.5' depth within smelly bluish contaminated soil, and had high DRO/RRO levels of 10,000 mg/kg and 17,000 mg/kg.

Contaminated soil also was found in a second nearby un-concreted surface strip that was about 8' wide, located 25' further north and starting about 25' in front of the former 27' barker building location (Photo #127, page B66). The concrete surface between the two areas was removed in long sections (Photo #128, page B66), and by 9/17/12 an entire area of about 30' x40' was excavated to 9' depths before clean soil was reached (photos on page B67). As confirmation sampling was taking place on the morning 9/17/12, the area abruptly began filling with tidal water and one of the confirmation samples (B-7) was lost. The water rose to about a 4' depth within 2 hours, and coincided with the high tide for the day. Fortunately the water completely drained soon after high tide, allowing excavations to proceed with minimal difficulty.

Excavations continued through 9/18/12, excavating eastward to 9' depths and removing large strips of concrete along the south side so as to expose the underlying contaminated soil (photos on page B68). By the end of 9/19/12, excavations finally reached the end of contaminated soil at 143' east of the original starting point, and soils were removed 9' under the south 6'-high concrete kickout structure (Photos #133-#135, pages B69-B70).

The 9/14-19/12 log barker excavations and sampling results are shown on Figure 27 (page A28). DRO and RRO cleanup criteria were met throughout the excavated area along the north embankment and the excavation bottom, with the exception of sample B-19 at a 9' depth, which had a RRO level of 13,000 mg/kg. However, substantial contaminated soil remained along the west and south embankments, and excavations in those directions continued for the remainder of September.

By 10/24/12, the log barker area excavation had been enlarged 80'-100' to the south, and the northwest corner was extended about 60' to the west (Photos #136-#137, pages B70-B71). Exploratory excavations were made along the south side of the 6'-high concrete kickout structure to determine if contaminated soil continued in that direction, and soil samples were taken under the opposite north side where the bluish-gray contaminated layer was exposed under the kickout structure (Photos #138-#139, pages B71-B72). DRO/RRO sample results under the north undercut side of the kickout structure were 55 - 7,200 mg/kg and 260 - 5,200 mg/kg, which met the cleanup criteria. In addition, sample results around the front and south side of the kickout structure also met the cleanup criteria (Photo #141, page B73) and confirmed the entire east end of the excavation to meet the cleanup criteria.

Excavations on 10/25-27/12 removed the remaining 18'-wide strip of soil in the excavation's southwest corner, ending along the side and front of the earth-filled log-loading ramp. Confirmation soil sampling was completed across the entire floor of the excavation and met cleanup criteria (Photos #142-#147, pages B73-B76), with the following results:

- A. Samples B-53 through B-60 were taken across the northwest portion of the excavation, with sampling depths of 8.5'-10'. Sampling results ranged between 10 - 530 mg/kg for DRO, and <11 - 320 mg/kg for RRO.

- B. Samples B-61 through B-79 were taken across the middle and entire south portion of the excavation, with sampling depths of 6'-10'. Sampling results ranged between <6 - 1,500 mg/kg for DRO, and <11 - 3,400 mg/kg for RRO.

Sampling was completed along the excavation's southwest corner embankment and the exposed side of the 10'-high log-loading ramp (Photos #143 & #145-#148, pages B45-B76), with the following results:

- A. Samples B-65, B-70 and B-89 all were taken at about a 5' depth in the bluish-grey soil layer exposed along the log-loading ramp's side piles. Their DRO/RRO levels were 18 - 7,200 mg/kg and 25 - 1,300 mg/kg, all of which met cleanup criteria.
- B. The only sample along the log-loading ramp's side piles that did not meet the cleanup criteria was sample B-83 (photos on page B75), which had a DRO level of 8,600 mg/kg.⁷ Figure 28 (page A29) shows the small area estimated to remain above cleanup levels.
- C. Sample B-88 was taken in the bluish-black soil layer at a 3.5' depth along the southwest embankment, and its DRO/RRO levels were very low at 13 mg/kg and 60 mg/kg. In addition, characteristic sample B-86 was taken in a very black and thin liquid soil layer (Photo #148, page B76). Its DRO/RRO levels of 3,600 mg/kg and 1,600 mg/kg also met the cleanup criteria.

Sampling also was completed in front of the 10'-high log-loading ramp's bulkhead and along the excavation's west embankment, with the following results:

- A. Sample B-44 was taken in the blue-gray soil layer at a 5' depth along the front of the earth-filled ramp's concrete bulkhead (Photo #140, page B72), and its DRO/RRO levels of 6,200 mg/kg and 910 mg/kg met the cleanup criteria.
- B. Samples B-33, B-80 and B-81 were taken at a 5' depth within the bluish-gray soil layer along the west embankment (Photo #149, page B77). Their DRO/RRO levels of 1,800 - 7,200 mg/kg and 1,000 - 3,200 mg/kg all met the cleanup criteria.
- C. Sample B-32 came from a 5' depth within the bluish-gray soil layer in the excavation's northwest corner, and its DRO level of 16,000 mg/kg exceeded the cleanup criterion.⁸ Figure 28 (page A29) shows the estimated area to be excavated.

In summary, about 4,660 c.y. of contaminated soil were removed from the log barker cleanup site and stockpiled for eventual bioremediation treatment. Aside from the 3 small areas described below, the remainder of the log barker cleanup site was confirmed to meet the DRO and RRO cleanup criteria. The 3 areas are shown on Figure 28 (page A29), and will be excavated in early spring of 2013 as soon as weather allows:

- A. The excavation's northwest corner embankment, where about 10-30 c.y. of contaminated soil is estimated to need removal.
- B. Along the excavation's southwest side and under the earth-filled log-loading ramp, where about 10-15 c.y. is estimated to need removal.
- C. On the excavation floor near the north embankment, where sample B-19 had a high RRO level of 13,000 mg/kg and about 10-15 c.y. is estimated to need removal.

⁷/ The RRO level for sample B-83 was 1,200 mg/kg, which met its cleanup criterion of 8,300 mg/kg.

⁸/ The RRO level for sample B-32 was 4,900 mg/kg, which met its cleanup criterion of 8,300 mg/kg.

VII. OTHER AREAS EVALUATED

VII.1. Former White Pass Fuel Depot Site

At the request of ADEC (Ref. Document #8, pages C22-C23), the former White Pass fuel depot site was evaluated for potential contaminated soil on 9/15/12. The location of the former White Pass fuel depot is shown adjacent to the mill's dock in Figure 4 (page A5). It was installed at the Wrangell Lumber mill sometime in the late-1980's, and can be seen in the 6/4/91 Photo #1 (page B2). It was removed sometime in 1992 or early-1993, and was completely gone by the time that the 8/24/93 Photo #2 (page B3) was taken. By 2012, the former White Pass fuel depot site was almost completely covered with alder growth (Photo #110, page B57).

Figure 24 (page A25) provides a site plan of the former White Pass fuel depot. The 9/15/12 evaluation began by locating the two fueling stations which were along the southeast corner of the site. The concrete pad where the White Pass Company fueled its trucks was still in place, and long 2'-deep trenches were dug on both sides of the pad's upper end where the White Pass tanker trucks were fueled. However, no indications of any contamination were found (Photo #111, page B58). Samples WP-1 and WP-2 had low DRO/RRO levels of 440 - 870 mg/kg and 870 - 1,900 mg/kg which met cleanup criteria. The excavations and sampling results are shown on Figure 25 (page A26).

Three exploratory trenches of 2'-4' depths were dug along the upper end of the access roadway where the Wrangell Lumber equipment had been fueled (Photo #112, page B58). Once again, there were no indications of any contamination found, and samples WP-3, WP-4 and WP-5 all had low DRO/RRO levels of 5 - 92 mg/kg and 28 - 160 mg/kg.

Three additional exploratory excavations were made where the fuel storage tanks and product barrels were stored, as shown on Figure 28. Results were as follows:

- A. A 4'x9'x4'-deep excavation was made along the northeast corner of the White Pass fuel depot site, at a location where 55-gallon barrels of product had been stored (Photo #113, page B59). Only clean-appearing brown soil was found, and sample WP-6 had low DRO/RRO levels of 170 mg/kg and 680 mg/kg.
- B. A 5'x12'x5'-deep excavation was made along the back northwest corner of the former White Pass fuel depot site, adjacent to where large horizontal fuel storage tanks had been located (Photo #114, page B59). Only clean-appearing brown soil was found, and sample WP-7 had low DRO/RRO levels of 80 mg/kg and 410 mg/kg.
- C. A 4'x8'x3.5'-deep excavation was made in the west portion of the former White Pass fuel depot site, where a row of 5 large horizontal fuel storage tanks had been located (Photo #115, page B60). Only clean-appearing brown soil was found, and sample WP-8 had low DRO/RRO levels of 47 mg/kg and 140 mg/kg.

In summary, there were no indications found of any potential contamination at the former White Pass fuel depot site, and the sampling results at all exploratory excavation sites were very low and easily met the cleanup criteria.

VII.2. Planer Building Ditch Line

At the request of ADEC (Ref. Document #8, pages C22-C23), the former planer mill's transformer area and the surface water drainage ditch line along the edge of the former planer mill's asphalted access road was evaluated on 9/15-16/12. The former planer mill's ditch line is shown in the southeast portion of Figure 4 (page A5). It began at the Wrangell Lumber mill's shop ditch line sump discharge, which had been cleaned of contaminated sediment earlier in the year as Cleanup Area #4 (refer to Figure 10, page A11, and Section VI.D, page 9).

Figure 26 (page A27) provides a site plan of the two remaining storage buildings that once were part of the much larger former planer mill facility, shown in dotted lines. The planer mill's three transformers were located along the east side of the northernmost storage building. As shown in Photo #116 (page B60), the only thing remaining was the electrical junction box that serviced the three transformers. There were only incidental oil stains in the vicinity of where the transformers had been located. A small upright fuel tank with a fuel line going into the building was to the immediate left of the junction box. The tank appeared to be full and in good condition with no apparent leakage.

The asphalt surface at the former transformer location sloped 50' down to the shop's drainage ditch sump, where the planer ditch line began. Photo #117 (page B61) provides a view of the asphalt-covered access between the former planer facility on the right of the photo, and the drainage ditch line. No oil stains were noticed on the asphaltic surface, which extended to the side of the ditch line for its entire length. Sample PD-1 was taken 14' downstream of the sump and 14" directly below the edge of the asphalt surface (Photo #118, page B61). Its brown-colored sediment had no indication of contamination, and its DRO/RRO levels were 250 mg/kg and 1,100 mg/kg which met the cleanup criteria.

Brown organic soil with no sign of contamination was observed about 70' downstream of the ditch line sump, and therefore no sample was taken. The ditch line was found to be culverted and/or covered over between about 110' and 180' downstream of the sump. Another soil sample PD-3 was taken at about 230' downstream of the sump, just before the ditch line made a 90° turn around the south end of the former planer facility. The sample was taken at a 30" depth directly under the edge of the asphalt surface, in brown-colored sediment/mud that had a grayish discoloration (Photo #120, page B62). Its DRO/RRO levels were 200 mg/kg and 700 mg/kg, which met the cleanup criteria.

The final soil sample PD-2 was taken just after the 90° turn of the ditch line around the former planer building's south end, about 270' from the ditch line sump. The 3'-deep brown-colored sample had DRO/RRO levels of 760 mg/kg and 3,900 mg/kg, which met the cleanup criteria. A water sample PD-4 was taken adjacent to this location in the 6"-deep stream (Photo #119, page B62). The water sample was evaluated for GRO/BETX, DRO, RRO, SVOC and RCRA metals. All results (Vol. II, pages E374-E389) were below their reporting limits except for the metal barium, which was detected at 0.19 mg/L and well below its cleanup criterion of 2 mg/L.

In summary, no contaminants above the cleanup limits were found along or within the former planer ditch line. In addition, there were no indications of any potential contamination above cleanup criteria around the former planer building's transformer area.

VIII. COMPLETION SCHEDULE

VIII.1. Completion of Excavations

Snow and winter weather regrettably prevented the remaining three cleanup areas from being completed in 2012, but they will be completed as soon as weather permits in the spring of 2013:

1. Green chain/sorter line: Nearly all excavations were completed to cleanup criteria. Only a small 2'-4' deep area with an estimated 3-5 c.y. of contaminated soil in its northwest corner remains to be excavated.
2. City-tie transformer site: This excavation was completed along the back and side of the transformer concrete pad, and all that remains is an estimated 15-30 c.y. of contaminated soil to be excavated immediately below the concrete pad.
3. Log barker area: This very large excavation was nearly completed in late 2012. Three relatively small areas with an estimated 30-60 c.y. still remain to be excavated.

VIII.2. Bioremediation Quantities & Schedule

As shown on Table I (page 2), an estimated 9,360 c.y. of contaminated soil were excavated from the Wrangell Lumber mill site cleanup areas in 2012. About 3,200 c.y. were vibratory-screened by mid-July, and fertilizer and urea arrived in Wrangell to begin the bioremediation treatment. Regrettably the biocells could not be set up because excavations continued for the remainder of the year. As a result, the intended biocell area (ref. Figure 6, page A7) was needed for temporary stockpiling of excavated soil and equipment maneuvering space.

Photos #149-#150 (pages B77-B78) show the vibratory-screened contaminated soil, and the unscreened stockpile of soil removed from the cherry picker excavation by 8/23/12. As shown in Photo #152 (page B78), the number of soil stockpiles and their required space substantially increased by 10/27/12, when the Wrangell Lumber mill excavations ended for the year.

As soon as the remaining excavations are completed (see Section VIII.1 above), most if not all of the remaining unscreened soil from 2012 and the additional volume from this spring's excavations will be vibratory-screened. The oversize rock will be removed and used as fill, and about 6,100 c.y. of contaminated soil is expected to need bioremediation treatment. A proposed bioremediation plan will be drafted and included in the 2013 cleanup report that documents the final excavations.

IX. SUMMARY

Excavations at the Wrangell Lumber mill site began on 5/15/12 and continued through 7 time periods, on 5/15-19/12, 6/4-5/12, 6/29-7/1/12, 7/21-22/12, 8/21-22/12, 9/14-19/12, and 10/24-27/12. Eight of the eleven environmental cleanup areas involving soil excavations were confirmed to meet cleanup levels:

1. Jet-A fuel tank site.
2. Electric generator site.
3. Shop ditch line and sump.
4. Transformer/emergency generator site.
5. Fuel depot site.
6. Oil/water separator pond.
7. Mt. Seley.
8. Cherry picker line.

Two of the cleanup areas did not involve soil excavations, but were associated with the identification and disposal of all remaining hazardous wastes and used oil at the mill site. Carson Dorn Inc. of Juneau AK carried out a hazardous and used oil inventory on 5/18/12. The used oil was found to meet the used oil burning specifications and was used locally as fuel for energy recovery. Three of the 4 drums of hazardous waste were taken to the Wrangell Household Hazardous Waste Collection Event on 5/19/12 for disposal, and the remaining drum was stored for eventual disposal at the 2013 event.

Snow and winter weather prevented the remaining three cleanup areas from being completed in 2012, but they will be completed as soon as weather permits in the spring of 2013:

1. Green chain/sorter line: Nearly all excavations were completed to cleanup criteria. Only a small 2'-4' deep area with an estimated 3-5 c.y. of contaminated soil in its northwest corner remains to be excavated.
 2. City-tie transformer site: This excavation was completed along the back and side of the transformer concrete pad, and all that remains is an estimated 15-30 c.y. of contaminated soil to be excavated immediately below the concrete pad.
 3. Log barker area: This very large excavation was nearly completed in late 2012. Three relatively small areas with an estimated 30-60 c.y. still remain to be excavated.
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