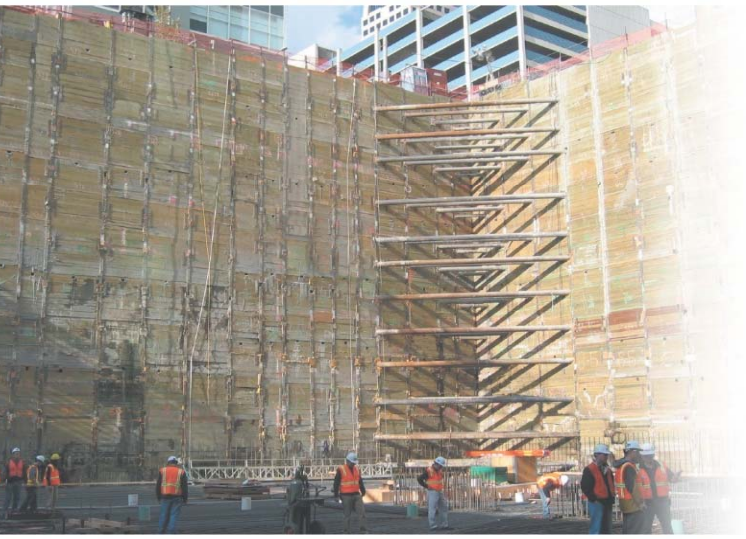

Seattle City Light
Newhalem Penstock
Soil Sampling/XRF Survey

Newhalem, Washington

Prepared for

Seattle City Light

September 22, 2014
17843-40

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Prepared by

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APPENDIX A

XRF Results

APPENDIX B

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Newhalem Penstock

Newhalem, Washington

1.0 INTRODUCTION

The Newhalem Penstock, located in northwestern Washington State (Figure 1) was originally constructed as part of the power plant used during construction of the Gorge Dam and is still in operation. The tunnel and penstock construction was completed in the 1920s. The penstock is 1,122 feet long, approximately 904 feet of which is above ground. The remaining 218 feet is located within a tunnel. The 30-inch-diameter penstock is supported above the ground with wood supports on bases of wood or concrete, or stone in the ground.

This investigation was performed in support of the penstock pedestal replacement project to determine disposition of soils likely to be disturbed by that work. It is not known if sandblasting may have been used to remove old coats of paint, which may have contained lead before repainting the penstock. Much sandblast grit used historically in the Puget Sound region was derived from metal slag and may have contained heavy metals including lead, arsenic, copper, and zinc. In addition, the wood supports for the penstock may have been preserved with copper chromium arsenate (CCA), creosote, or pentachlorophenol. If wood preservatives were used, these chemicals may have leached into nearby soil.

Hart Crowser conducted a field survey using a portable x-ray fluorescence spectrometer (XRF) to screen soil samples for metals historically associated with sandblast grit, lead-based paint, and wood preservatives (lead, arsenic, copper, chromium, and zinc). Our field activities were completed in general accordance with our Sampling and Analysis Plan (SAP) dated June 12, 2014. Selected samples were submitted to OnSite Environmental Laboratory (OnSite) for analysis of:

- Selected metals to verify field XRF results and determine correlations between XRF and laboratory results;
- Toxicity characteristic leaching procedure (TCLP) analysis of metals (lead) with concentrations that exceeded potential threshold criteria to determine if excavated soil would be classified as dangerous waste;
- Total mercury and cadmium for soil profiling to determine potential disposal options; and
- Semivolatile organic compounds associated with creosote and pentachlorophenol wood preservatives.

2.0 SUMMARY OF FIELD INVESTIGATION ACTIVITIES

Field activities were conducted on July 10, 11, and 12, 2014, by Hart Crowser with assistance from Seattle City Light personnel. Field activities consisted of establishing six transects along the penstock,

marking sample locations, and conducting an XRF survey. Soil samples were field screened for selected metals (lead, arsenic, copper, chromium, and zinc) using EPA Method 6200, Field Portable XRF Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment. The results were compared to the project threshold criteria (generally one-half MTCA Method A or Method B cleanup levels). Selected soil samples were collected in small plastic bags for transfer to sample containers for confirmatory laboratory analysis.

2.1 XRF Survey

Six transects were established in the field. Seattle City Light and Hart Crowser scientists selected transects at approximately 100-foot intervals. Transect 1 was located at the bottom of the penstock, closest to the Newhalem powerhouse, while Transect 6 was located toward the top of the slope. Transects 2 through 5 were located between 1 and 6 in numerical order. The locations of the transects were, therefore, determined with reference to the numbered penstock supports. The transect locations are shown on Figure 2.

At each transect, a center sample was measured below the penstock. Moving perpendicularly away from the penstock, the next samples were collected approximately 2 feet away (depending on site conditions), with the next samples outward approximately 3 feet distant, continuing outwards at 3 feet intervals. A number of transect lines were situated at an angle away from the Penstock, rather than perpendicular (depending on where soil could be located for sample collection). Each sample location was marked with pin flags, except the center sample. The samples were labeled with the transect number, the direction (C for center, E for east, W for west), and the feet measured from the side of the penstock (e.g., T1-E-11.5' was the sample located 11.5 feet east of the penstock on Transect 1).

The samples were measured approximately 3 feet distant on the ground from the previous sample location. Samples located along the upper transects (Transects 5 and 6), where the Penstock was located in a hollow between boulders, were therefore collected up the sides of the hollow, rather than at a horizontal distance from the Penstock.

Samples SA-9-W and SA-20-W were collected on the west side of the penstock within three inches of support saddles SA-9 and SA-20, respectively (Figure 2), and were submitted for semivolatile organic compound (SVOC) analysis.

Soil XRF screening activities were conducted in general accordance with the SAP (Hart Crowser 2014). Vegetation, small rocks, and gravel were cleared from an approximately 4-inch by 4-inch area. A decontaminated stainless steel spoon and/or a clean gloved hand was used to smooth and flatten the area. Soil samples were either measured directly on the ground surface with the XRF or a sample was collected into a thin plastic bag and analyzed.

Field Observations

The Penstock is located on a steep slope that flattens out towards the bottom above the Newhalem Powerhouse. The top of the slope is predominantly rocky, and the Penstock is located in a depression

(or hollow) between piled up boulders. The trees are cut back approximately 15 feet to each side of the Penstock, and the open area is maintained through use of powered weed-cutters.

During sample collection, an attempt was made to collect GPS coordinates. Due to the steep slopes and heavy tree cover, the horizontal GPS error recorded by the instruments was between 20 and 34 feet. Therefore, sample locations were measured by tape from the Penstock and marked with pin flags.

The soil along the Penstock was generally a damp, dark brown, silty sand or sandy silt. No obvious sandblast grit was observed in soil along the length of the penstock. Samples collected from Transects 1 and 2 on the flatter area near the Powerhouse were generally slightly damp, dark brown, sandy silt with rootlets. Transect 3 samples contained more gravels, and ranged from dry to damp, light brown to red brown, silty sand to sandy silt with gravels and rootlets.

Samples collected close to the Penstock at Transect 4 were moist to damp, gray-brown, gravelly silty sands, while samples further away from the Penstock were dry, brown, slightly gravelly sands. Samples collected at Transect 5 on the slope were damp, dark brown, gravelly, silty sands with rootlets that were collected from below at least 3 inches of duff. Samples collected from Transect 6 on the steepest part of the slope, were damp to moist, dark brown, silty sands with roots and rootlets, collected approximately 6 inches below duff.

Two samples were collected for SVOC analysis. The samples were collected from soil approximately three inches away from wood support saddles that appeared to have been treated with creosote. The samples were collected from the west side of the Penstock at Saddles 9 and 20 (SA-9-W and SA-20-W). The soils were dry, brown, silty sand, and showed no obvious evidence of creosote impacts.

Two samples were collected away from the Penstock as background samples. Sample B-W was collected approximately 46 feet west of the Penstock, within the woods. The soil was collected from below 1" of forest duff, and was a dry, dark brown, silty sand with abundant roots. Sample B-N was collected north of the parking lot next to the Newhalem powerhouse, in the woods (approximately 76 feet from the largest tree at the northwest corner of the parking lot, at a bearing of 285°.) The sample was collected from below 1" of forest duff, and was a dry, light brown, silty gravelly sand with abundant roots.

XRF Screening Results

A total of 57 transect soil samples, one field duplicate, and two soil background samples were screened. The penstock and paint on the wood supports were also screened. Summary results for arsenic and lead are shown on Figure 3. The complete XRF sample results, with quality control checks, are reported in Appendix A.

XRF screening action levels were set at one-half the MTCA Method A or Method B unrestricted land use cleanup levels to account for differences in the sensitivity of XRF and laboratory methods. Plots showing correlations between field XRF and laboratory results for lead and zinc are presented on Figures 4 and 5, respectively. XRF results tended to be lower than laboratory results for both lead and

zinc. The lead correlation improved if the apparent outlier was removed, but XRF results were still lower than the laboratory. Correlations were not performed for other metals because concentrations were too low or there were a large number of nondetected results.

No samples exceeded the field XRF action levels for chromium, copper, or zinc. Forty-seven samples exceeded the field XRF action level for arsenic of 10 mg/kg. Forty-five samples exceeded the field XRF action level for lead of 125 mg/kg. The highest levels of arsenic and lead were observed from samples collected closest to the penstock. The highest levels of lead were observed along Transects 5 and 6, while the highest levels of arsenic were observed along Transect 6.

Two background samples (B-N and B-W) were collected away from the penstock. The levels of arsenic and lead were lower than were observed along the penstock. The levels of chromium, zinc, and copper in the background samples were generally comparable to the levels measured around the penstock.

One area of green staining on a support (saddle number 20 on Figure 2) was measured in the field using the XRF to determine if inorganic wood preservatives were present. The green staining contained much higher levels of chromium compared to the transect samples, while the levels of lead were lower than transect samples measured close to the penstock. Yellow-green paint on the penstock near the same location was also screened by the XRF. This paint contained copper and lead, though the lead levels were generally lower than was observed in the nearby soil transect samples.

2.2 Soil Sampling and Analytical Results

Based on the XRF screening results, Hart Crowser selected 16 soil samples for analysis of the five target metals. Two to three samples from each transect and the two background samples (B-N and B-W) were submitted for laboratory analysis. Samples were selected for laboratory analysis based on the following criteria:

- The outermost sample from either side of a transect that exceeded the XRF field action levels (Samples T1-E-8', T2-W-16', T3-W-5', T4-W-11', T5-W-11', and T6-E-11')
- The sample with the highest metal concentration from each transect (Samples T1-C, T2-W-2', T3-E-2', T4-C, T5-C, and T6-E-5')
- Samples located at the edge of transects, with low levels of metals (Samples T2-W-19' and T4-E-11')

Two samples (SA-9-W and SA-20-W on Figure 2) were also collected from soils within 3 inches of the wood supports (saddles) for analysis of semivolatile organic hydrocarbons (SVOCs). Samples were selected based on black staining observed on the supports.

The soil samples were submitted to OnSite Laboratory of Redmond, Washington for chemical analysis of metals (arsenic, chromium, copper, lead, and zinc) by EPA Method 6010C or SVOCs (2 samples) by EPA Method 8270D. The four laboratory soil samples with the highest total lead concentrations (T1-C,

T5-C, T6-E-5, and T6-E-11) were also submitted for cadmium and mercury analysis to evaluate potential disposal requirements.

TCLP was used to analyze lead leachate concentrations in four soil samples with the highest total lead concentrations (T1-C, T5-C, T6-E-5', and T6-E-11'). TCLP analysis was not performed for other metals since soil concentrations were less than the threshold (20 times the TCLP criterion) for potential TCLP exceedances.

Soil Analytical Results

Analytical results for metals are presented in Table 1 and results for SVOCs associated with wood preservatives are summarized in Table 2. The results of our review of chemical data quality and laboratory reports are provided in Appendix B.

Total Metals

Of the 14 transect samples analyzed for metals, no samples exceeded the MTCA Method A or MTCA B cleanup levels for Unrestricted Land Use for chromium, copper, or zinc. Cadmium and mercury were not detected in the four samples submitted for analysis. Two samples exceeded the MTCA Method A cleanup level for arsenic of 20 mg/kg. Ten samples exceeded the MTCA Method A cleanup level for lead of 250 mg/kg.

The two background samples (B-N and B-W) had no exceedances for the MTCA Method A cleanup levels for the metals analyzed (Table 1). The levels of lead were lower than the samples collected close to the Penstock.

TCLP Analysis

Lead TCLP leachate concentrations for samples analyzed were less than the dangerous waste criterion of 5 mg/L. TCLP analysis was not performed for other metals because the total metal concentrations were less than the threshold (20 times the TCLP criterion) required to potentially exceed TCLP criteria.

Semivolatile Organic Compounds

Pentachlorophenol or other chlorinated phenols associated with wood preservatives were not detected in the analyzed samples.

PAHs and methylphenols (cresols) often associated with creosote-preserved wood were detected in both soil samples (SA-9-W and SA-20-W) collected adjacent to the wood supports. PAH concentrations expressed in terms of benzo(a)pyrene toxic equivalents (TEQ) exceeded the MTCA Method B unrestricted soil cleanup level of 0.137 mg/kg.

3.0 CONCLUSIONS

Soil lead concentrations in the immediate vicinity of the penstock exceeded MTCA Method A unrestricted land use cleanup level of 250 mg/kg indicating that lead-based paint was likely used on the penstock in the past. No visual evidence of sandblast grit was observed and, based on soil metal concentrations, it is unlikely that sandblast grit derived from metal slag was used for paint removal

since soil concentrations of metals associated with sandblast grit (arsenic, copper, and zinc) were low, generally within the range of natural background concentrations.

The highest levels of lead were observed generally closest to the Penstock, either directly below or within five feet. The use of powered weed-cutters to maintain the cleared area around the Penstock may have contributed to the spread of metals beyond the immediate vicinity of the Penstock.

Samples collected from Transects 5 and 6 at the top of the slope generally had higher levels of lead further from the Penstock. Those samples were collected from pockets of soil between boulders where fine soils may have accumulated. Additionally, as the Penstock was located within a hollow at those transects, and the samples were collected up the sides of the hollow, any soils redistributed by weed-cutting activities would have stayed within the hollow.

Wood support structures for the penstock appear to be preserved with creosote. Soil PAH concentrations in close proximity to the wood supports exceeded the MTCA Method B unrestricted soil cleanup levels of 0.137 mg/kg benzo(a)pyrene toxic equivalents. However, creosote is generally relatively immobile and impacts are likely limited to the immediate vicinity of the wood supports.

Based on total metal concentrations and TCLP results, none of the samples submitted for laboratory analysis would classify the soil as a dangerous waste. If soil were excavated in the future, disposal at a Subtitle D landfill would be required rather than at a subtitle C landfill. In the absence of soil removal, worker and public protection might be addressed by posting warning signs and fencing along the penstock.

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Table 1 - Analytical Results for Transect Soil Samples - Metals
Newhalem Penstock

Sample ID	Sampling Date	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Zinc	TCLP Lead
		Concentration in mg/kg							mg/L
MTCA Screening Level [a]		20	2	2000 [b]	3,200 [c]	250	2	24,000 [c]	5
B-N	7/11/2014	13 U		**26**	**11**	**12**		**77**	
B-W	7/11/2014	12 U		**11**	**11**	**42**		**39**	
T1-C	7/10/2014	**25**	0.68 U	**26**	**45**	**1800**	0.34 U	**150**	**4.3**
T1-E-8'	7/12/2014	**17**		**22**	**34**	**350**		**120**	
T2-W-16'	7/11/2014	12 U		**17**	**20**	**56**		**57**	
T2-W-19'	7/11/2014	14 U		**16**	**22**	**25**		**57**	
T2-W-2'	7/12/2014	15 U		**31**	**25**	**610**		**77**	
T3-E-2'	7/11/2014	17 U		**30**	**26**	**1200**		**91**	
T3-W-5'	7/11/2014	**20**		**24**	**33**	**480**		**79**	
T4-C	7/11/2014	13 U		**40**	**16**	**1000**		**55**	
T4-E-11'	7/11/2014	12 U		**22**	**18**	**9.6**		**54**	
T4-W-11'	7/11/2014	13 U		**18**	**16**	**70**		**60**	
T5-C	7/11/2014	15 U	0.77 U	**20**	**25**	**1300**	0.39 U	**210**	**1.2**
T5-W-11'	7/11/2014	14 U		**12**	**26**	**950**		**68**	
T6-E-11'	7/11/2014	14 U	1.4 U	**19**	**47**	**1600**	0.69 U	**210**	0.2 U
T6-E-5'	7/11/2014	20 U	1 U	**15**	**14**	**2000**	0.51 U	**180**	**0.49**

Bold - Analyte detected
Shaded - Analyte concentration exceeds cleanup level
U = Not detected at detection limit indicated.
a - MTCA Method A unrestricted use cleanup level unless otherwise specified.
b - Chromium (III)
c - MTCA Method B unrestricted use cleanup level.

Table 2 - Analytical Results for Wood Support Soil Samples - Semivolatiles
Newhalem Penstock

Sample ID Sampling Date	MTCA Method B Cleanup Level	SA-9-W 7/11/2014	SA-20-W 7/11/2014
Wood Preservatives in mg/kg			
(3+4)-Methylphenol (m,p-Cresol)	4,000	**0.062**	0.041 U
2,3,4,6-Tetrachlorophenol	105,000	0.046 U	0.041 U
2,3,5,6-Tetrachlorophenol	none	0.046 U	0.041 U
2,4,5-Trichlorophenol	8,000	0.046 U	0.041 U
2,4,6-Trichlorophenol	80	0.046 U	0.041 U
2-Methylphenol (o-Cresol)	4,000	0.046 U	0.041 U
4-Chloro-3-methylphenol	none	0.046 U	0.041 U
Pentachlorophenol	2.5	0.23 U	0.2 U
PAHs in mg/kg			
Benzo(a)pyrene	0.137	**2.5**	**0.17**
Benz[a]anthracene	1.37	**5.5**	**0.27**
Benzo(b)fluoranthene	1.37	**6.6**	**0.4**
Benzo(j,k)fluoranthene	13.7	**1.2**	**0.13**
Dibenz(a,h)anthracene	0.137	**0.37**	**0.035**
Indeno(1,2,3-cd)pyrene	1.37	**0.98**	**0.081**
Chrysene	137	**7.3**	**0.41**
TEQ	0.137	**4.038**	**0.2657**

Bold - Analyte detected
Shaded - Analyte concentration exceeds cleanup level
U = Not detected at detection limit indicated.

0 4000 8000
Scale in Feet

N

Source: Base map prepared from ArcGIS Online, 2014.

Newhalem Penstock Soil Sampling
Newhalem, Washington

Vicinity Map

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Figure
1

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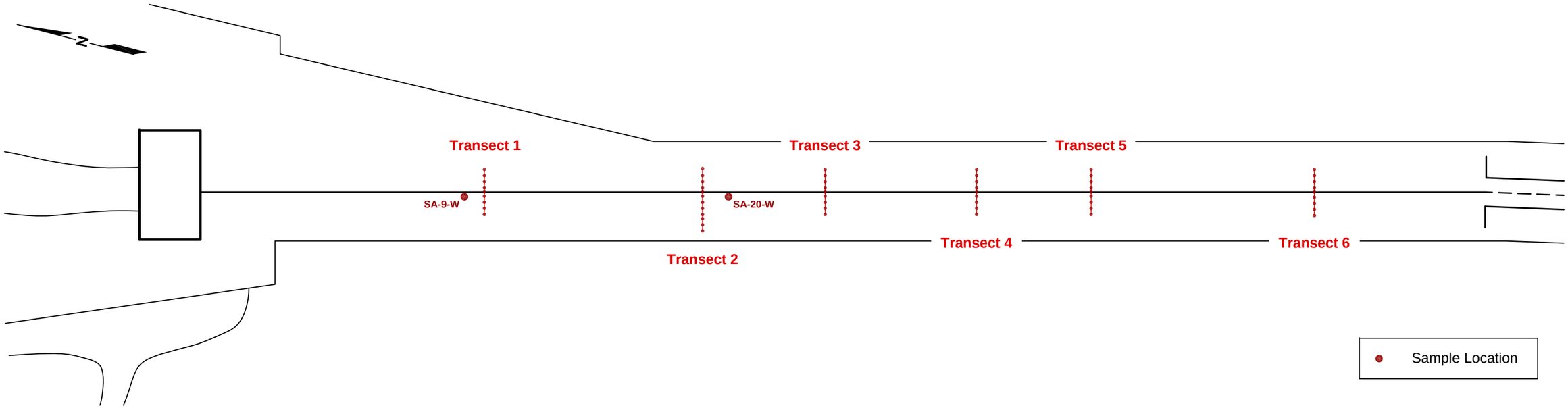
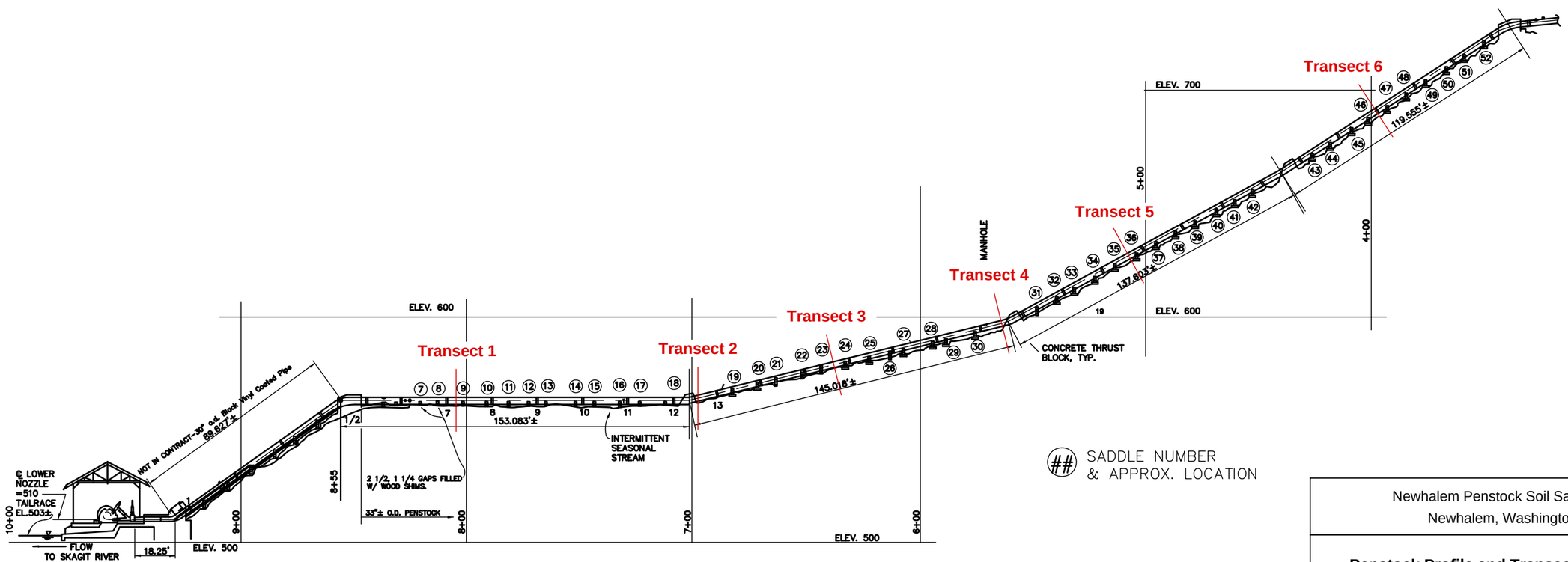


Plan View of Penstock

Approximately 1"=50'



Profile View of Penstock

Approximately 1"=50'

Source: Base map prepared PDF record drawing provided by Seattle City Light, dated 1987.

Newhalem Penstock Soil Sampling
Newhalem, Washington

Penstock Profile and Transect Locations

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Figure **2**

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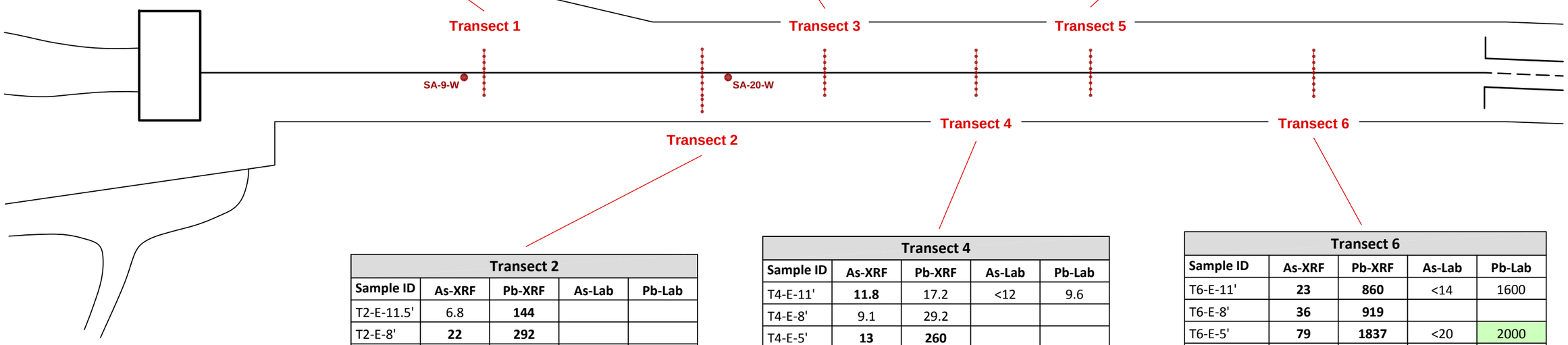
Transect 1				
Sample ID	As-XRF	Pb-XRF	As-Lab	Pb-Lab
T1-E-11'	**19.7**	71		
T1-E-8'	**18**	**374**	17	350
T1-E-5'	**11**	**321**		
T1-E-2'	**12**	**446**		
T1-C	**28**	**895**	25	1800
T1-W-2'	**19**	**572**		
T1-W-5'	**18**	**440**		
T1-W-8'	**15.7**	**163**		
T1-W-11'	9.7	30.3		

Transect 3				
Sample ID	As-XRF	Pb-XRF	As-Lab	Pb-Lab
T3-E-11'	**17.6**	11.8		
T3-E-8'	**13.2**	53.2		
T3-E-5'	**13.8**	88.4		
T3-E-2'	**11**	**392**	<17	1200
T3-C	**24**	**275**		
T3-W-2'	**28**	**315**		
T3-W-5'	**22**	**331**	20	480
T3-W-8'	**26.2**	73.5		
T3-W-11'	**19.3**	14.2		

Transect 5				
Sample ID	As-XRF	Pb-XRF	As-Lab	Pb-Lab
T5-E-11'	**14**	**371**		
T5-E-8'	**39**	**503**		
T5-E-5'	<9	**506**		
T5-E-2'	**27**	**791**		
T5-C	<29	**5485**	<15	1300
T5-W-2'	**27**	**536**		
T5-W-5'	**28**	**459**		
T5-W-8'	<10	**658**		
T5-W-11'	**24**	**440**	<14	950



Transect 2				
Sample ID	As-XRF	Pb-XRF	As-Lab	Pb-Lab
T2-E-11.5'	6.8	**144**		
T2-E-8'	**22**	**292**		
T2-E-5'	**17**	**378**		
T2-E-2'	**14**	**336**		
T2-C	**25**	**471**		
T2-W-2'	**28**	**531**	<15	610
T2-W-5'	**19**	**373**		
T2-W-8'	**11**	**194**		
T2-W-11'	**24**	**327**		
T2-W-13'	**14.3**	**169**		
T2-W-16'	**10.6**	**106**	<12	56
T2-W-19'	6.8	37.2	<14	25

Transect 4				
Sample ID	As-XRF	Pb-XRF	As-Lab	Pb-Lab
T4-E-11'	**11.8**	17.2	<12	9.6
T4-E-8'	9.1	29.2		
T4-E-5'	**13**	**260**		
T4-E-2'	5.5	63.8		
T4-C	**44**	**965**	<13	1000
T4-W-2'	**32**	**483**		
T4-W-5'	**17**	**439**		
T4-W-8'	**14.9**	**147**		
T4-W-11'	**15.2**	**178**	<13	70

Transect 6				
Sample ID	As-XRF	Pb-XRF	As-Lab	Pb-Lab
T6-E-11'	**23**	**860**	<14	1600
T6-E-8'	**36**	**919**		
T6-E-5'	**79**	**1837**	<20	2000
T6-E-2.5'	**41**	**1535**		
T6-C	<11	**960**		
T6-W-2.5'	<15	**1593**		
T6-W-5.5'	**58**	**1066**		
T6-W-8.5'	**76**	**1366**		
T6-W-11.5'	**17**	**455**		

Concentration exceeds MTCA Method A cleanup level.

10.6 Concentration exceeds XRF screening threshold of one-half MTCA Mehtod A cleanup level.

N

0 50 100

Approximate Scale in Feet

Source: Base map prepared PDF record drawing provided by Seattle City Light, dated 1987.

Newhalem Penstock Soil Sampling
Newhalem, Washington

XRF and Laboratory Arsenic and Lead Results

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Figure **3**

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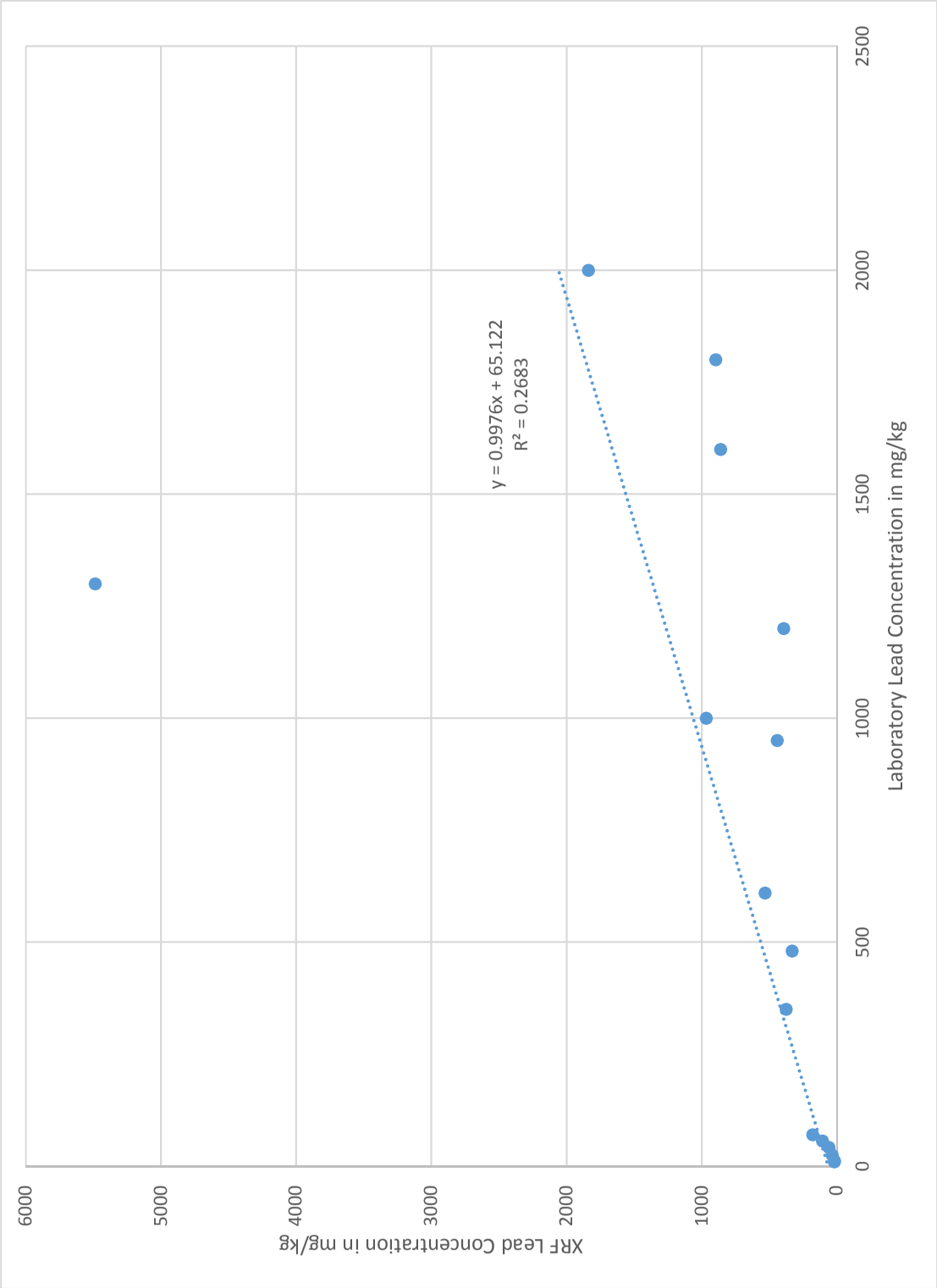

Newhalem Penstock Soil Sampling
Newhalem, Washington

Comparison Between Field XRF and Laboratory Results for Lead

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Figure

4

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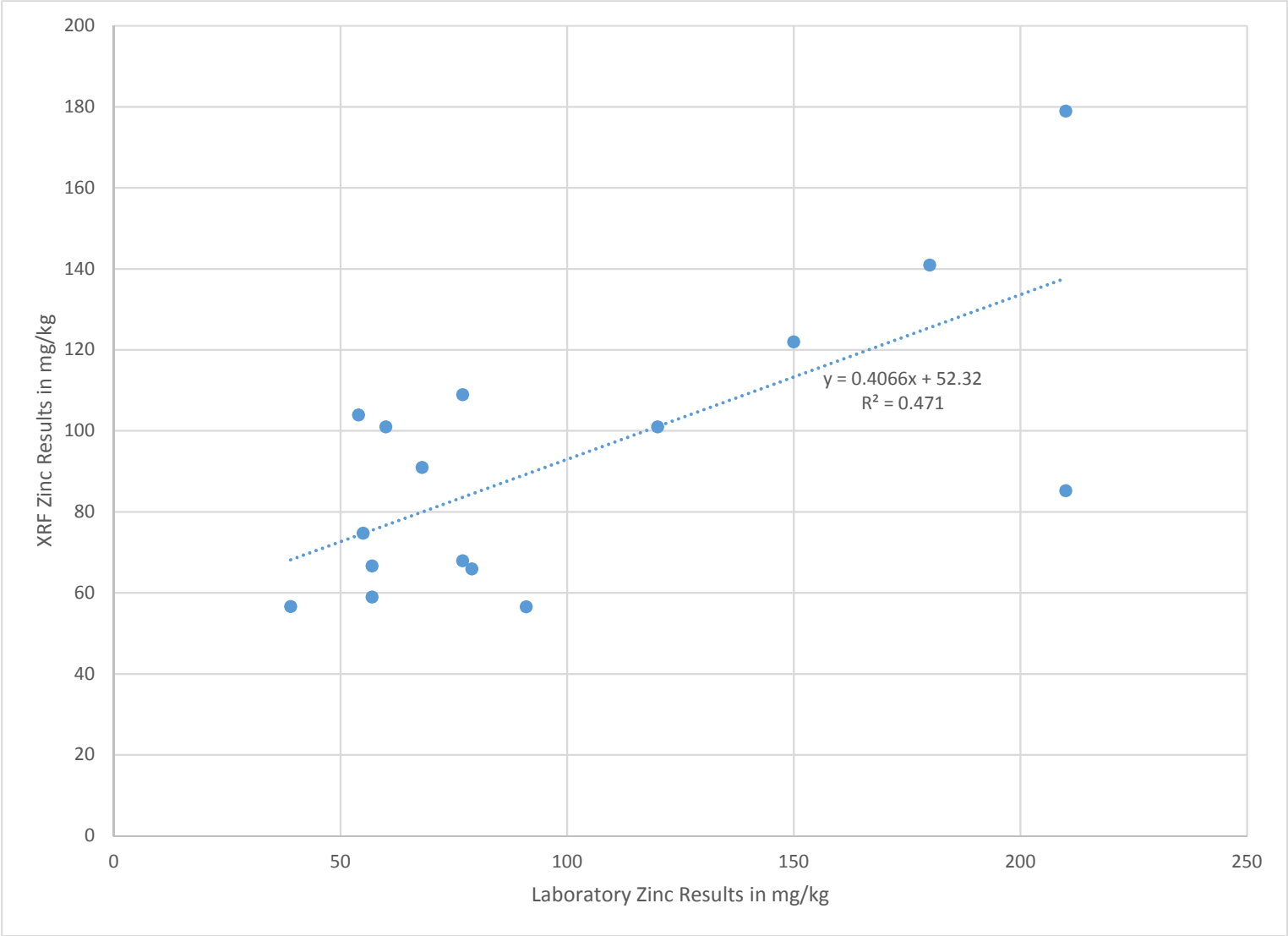

Newhalem Penstock Soil Sampling
Newhalem, Washington

Comparison Between Field XRF and Laboratory Results for Zinc

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Figure

5

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APPENDIX A
XRF Results

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Date	Time	Reading	Sample ID	Cr	Cr +/-	As	As +/-	Pb	Pb +/-	Cu	Cu +/-	Zn	Zn +/-	Unit	Cal Check
7/10/2014	10:57	#22	Cal Check											%	Passed
7/10/2014	16:15	#25	Blank	<LOD	8	<LOD	1.6	<LOD	2.3	<LOD	6	<LOD	2.5	PPM	
7/10/2014	16:18	#26	CCV	35	7	1620	15	5755	29	3624	23	4386	24	PPM	
7/10/2014	17:35	#27	T1-C	85	5	28	4	895	6	37	3	122	2	PPM	
7/10/2014	17:47	#28	T1-W-2'	28	4	19	3	572	4	35	3	104	2	PPM	
7/10/2014	17:52	#29	T1-W-5'	39	5	18	3	440	4	23	3	70.8	1.9	PPM	
7/10/2014	17:56	#30	T1-W-8'	<LOD	14	15.7	1.9	163	2	15	3	63	1.9	PPM	
7/10/2014	18:02	#31	T1-W-11'	<LOD	12	9.7	1	30.3	1.2	8	2	65.7	1.8	PPM	
7/10/2014	18:13	#32	T1-E-2'	16	5	12	3	446	4	28	3	129	3	PPM	
7/10/2014	18:20	#33	T1-E-5'	<LOD	9	11	2	321	3	8	2	81.6	1.9	PPM	
7/10/2014	18:24	#34	T1-E-8'	<LOD	9	18	2	374	3	14	2	101	2	PPM	
7/10/2014	18:28	#35	T1-E-11'	33	5	19.7	1.4	71	1.7	30	3	86	2	PPM	
7/10/2014	18:40	#36	T2-C	24	4	25	3	471	4	31	3	182	3	PPM	
7/10/2014	18:46	#37	T2-W-2'	24	5	28	3	531	5	11	3	68	2	PPM	
7/10/2014	18:51	#38	T2-W-5'	19	4	19	2	373	3	28	3	61.6	1.7	PPM	
7/10/2014	18:56	#39	T2-W-8'	22	5	11	2	194	3	12	3	65.4	2	PPM	
7/10/2014	19:07	#40	T2-W-11'	38	5	24	3	327	3	30	3	93	2	PPM	
7/10/2014	19:15	#41	T2-E-2'	16	4	14	2	336	3	19	2	65.9	1.7	PPM	
7/10/2014	19:19	#42	T2-E-5'	11	3	17	2	378	3	<LOD	6	60.3	1.7	PPM	
7/10/2014	19:25	#43	T2-E-8'	23	4	22	2	292	3	9	2	71.8	1.8	PPM	
7/10/2014	19:31	#44	T2-E-11.5'	<LOD	5.7	6.8	1.5	144	2	<LOD	6	75.8	1.8	PPM	
7/10/2014	19:36	#45	T2-W-13'	73	5	14.3	1.9	169	3	16	3	84	2	PPM	
7/10/2014	22:51	#1	Cal Check											%	Passed
7/10/2014	22:54	#2	Blank	<LOD	7	<LOD	1.5	<LOD	2.2	<LOD	6	<LOD	2.7	PPM	
7/10/2014	22:57	#3	CCV	<LOD	21	1652	15	5746	29	3583	23	4396	24	PPM	
7/11/2014	7:56	#4	Blank	<LOD	7	<LOD	1.5	<LOD	2.2	<LOD	6	3.9	0.9	PPM	
7/11/2014	8:00	#5	Blank	<LOD	7	<LOD	1.5	<LOD	2.2	<LOD	6	4	0.9	PPM	
7/11/2014	8:04	#6	Blank	<LOD	7	<LOD	1.5	<LOD	2.2	<LOD	6	4.4	0.9	PPM	
7/11/2014	8:06	#7	Blank	<LOD	7	<LOD	1.5	<LOD	2.2	<LOD	6	4.5	0.9	PPM	
7/11/2014	8:04	#8	CCV	<LOD	21	1653	15	5738	28	3640	23	4448	24	PPM	
7/11/2014	9:13	#9	Cal Check											%	Passed
7/11/2014	9:15	#10	PAINT	408	5	47.1	1.9	210	2	9	2	23.7	1.2	PPM	
7/11/2014	9:19	#11	PENSTOCK	<LOD	64	<LOD	7	154	3	380	8	13	2	PPM	

Date	Time	Reading	Sample ID	Cr	Cr +/-	As	As +/-	Pb	Pb +/-	Cu	Cu +/-	Zn	Zn +/-	Unit	Cal Check
7/11/2014	9:24	#13	T2-W-16'	<LOD	20	10.6	1.9	106	3	<LOD	10	59	2	PPM	
7/11/2014	9:41	#14	T2-W-19'	19	4	6.8	1	37.2	1.3	21	2	70.9	1.8	PPM	
7/11/2014	13:36	#15	Blank	<LOD	7	<LOD	1.5	<LOD	2.2	<LOD	6	5.1	0.9	PPM	
7/11/2014	13:39	#16	CCV	<LOD	21	1659	15	5821	29	3645	23	4516	25	PPM	
7/11/2014	13:43	#17	T5-C	19	4	<LOD	29	5485	24	23	3	179	3	PPM	
7/11/2014	13:47	#18	T6-C	<LOD	5.5	<LOD	11	960	6	<LOD	6	128	2	PPM	
7/11/2014	13:50	#19	T6-W-11.5'	32	3	17	3	455	4	24	3	111	2	PPM	
7/11/2014	13:53	#20	T6-E-11'	<LOD	5.5	23	4	860	5	<LOD	6	85.3	1.9	PPM	
7/11/2014	13:56	#21	T5-E-11'	<LOD	12	14	3	371	3	13	2	116	2	PPM	
7/11/2014	13:59	#22	T5-W-11'	18	4	24	3	440	4	29	3	91	2	PPM	
7/11/2014	14:02	#23	T2-W-19'	13	4	5.4	0.9	32.7	1.3	28	3	66.7	1.8	PPM	
7/11/2014	15:06	#24	T4-C	23	4	44	4	965	6	23	3	74.8	1.9	PPM	
7/11/2014	15:15	#25	T4-W-2'	14	4	32	3	483	4	27	3	94	2	PPM	
7/11/2014	15:24	#26	T4-W-5'	12	4	17	3	439	4	24	2	75.2	1.9	PPM	
7/11/2014	15:31	#27	T4-W-8'	33	5	14.9	1.8	147	2	13	3	86	2	PPM	
7/11/2014	15:38	#28	T4-W-11'	22	5	15.2	1.9	178	3	23	3	101	2	PPM	
7/11/2014	15:49	#29	T4-E-2'	<LOD	11	5.5	1.1	63.8	1.5	14	2	77.2	1.8	PPM	
7/11/2014	15:59	#30	T4-E-5'	45	4	13	2	260	3	14	2	95	2	PPM	
7/11/2014	16:09	#31	T4-E-11'	22	4	11.8	0.9	17.2	1.1	33	3	104	2	PPM	
7/11/2014	16:13	#32	T4-E-8'	<LOD	13	9.1	1	29.2	1.3	23	3	104	2	PPM	
7/11/2014	16:35	#33	T3-W-2'	26	4	28	2	315	3	23	3	92	2	PPM	
7/11/2014	16:39	#34	T3-W-5'	19	6	22	3	331	4	17	3	66	2	PPM	
7/11/2014	16:43	#35	T3-W-8'	32	5	26.2	1.5	73.5	1.8	20	3	88	2	PPM	
7/11/2014	16:46	#36	T3-W-11'	39	7	19.3	1.1	14.2	1.3	11	3	59	2	PPM	
7/11/2014	16:59	#37	T3-E-11'	24	5	17.6	0.9	11.8	1.1	17	3	170	3	PPM	
7/11/2014	17:03	#38	T3-E-8'	<LOD	13	13.2	1.2	53.2	1.5	14	2	123	2	PPM	
7/11/2014	17:07	#39	T3-E-5'	22	5	13.8	1.4	88.4	1.8	15	2	119	2	PPM	
7/11/2014	17:10	#40	T3-E-2'	21	4	11	3	392	4	<LOD	7	56.6	1.8	PPM	
7/11/2014	17:16	#41	T3-C	19	4	24	2	275	3	32	3	84	2	PPM	
7/11/2014	17:34	#42	B-W	<LOD	11	<LOD	3.6	58.1	1.6	16	3	56.7	1.8	PPM	
7/11/2014	18:09	#43	B-N	40	5	6	0.9	17.4	1.1	14	3	109	2	PPM	
7/11/2014	20:47	#44	Cal Check											%	Failed
7/11/2014	20:49	#45	Cal Check											%	Passed

Date	Time	Reading	Sample ID	Cr	Cr +/-	As	As +/-	Pb	Pb +/-	Cu	Cu +/-	Zn	Zn +/-	Unit	Cal Check
7/11/2014	20:51	#46	Blank	<LOD	7	<LOD	1.5	<LOD	2.3	<LOD	6	4	0.9	PPM	
7/11/2014	20:54	#47	CCV	23	7	1670	15	5821	29	3646	23	4516	25	PPM	
7/11/2014	20:58	#48	T5-E-2'	<LOD	9	27	3	791	5	<LOD	7	75.1	1.8	PPM	
7/11/2014	21:07	#1	T5-E-5'	<LOD	8	<LOD	9	506	4	<LOD	7	77.6	1.9	PPM	
7/11/2014	21:11	#2	T5-E-8'	13	4	39	3	503	4	11	2	131	2	PPM	
7/11/2014	21:14	#3	T5-W-2'	30	4	27	3	536	4	17	3	135	2	PPM	
7/11/2014	21:18	#4	T5-W-5'	<LOD	11	28	3	459	4	20	3	103	2	PPM	
7/11/2014	21:21	#5	T5-W-8'	<LOD	11	<LOD	10	658	5	27	3	106	2	PPM	
7/11/2014	21:25	#6	Blank	<LOD	7	<LOD	1.5	<LOD	2.3	<LOD	6	4.4	0.9	PPM	
7/11/2014	21:28	#7	CCV	28	7	1677	15	5845	29	3694	23	4468	25	PPM	
7/11/2014	21:32	#8	CCV	28	7	1555	15	5534	28	3399	22	4237	24	PPM	
7/11/2014	21:36	#9	T6-E-2.5'	23	3	41	5	1535	8	<LOD	7	110	2	PPM	
7/11/2014	21:40	#10	T6-E-5'	<LOD	7	79	5	1837	9	<LOD	7	141	2	PPM	
7/11/2014	21:43	#11	T6-E-8'	<LOD	5.4	36	4	919	6	<LOD	5.9	81.5	1.9	PPM	
7/11/2014	21:46	#12	T6-W-2.5'	33	3	<LOD	15	1593	8	<LOD	7	91	2	PPM	
7/11/2014	21:50	#13	T6-W-5.5'	12	3	58	4	1066	7	10	2	87	2	PPM	
7/11/2014	21:53	#14	T6-W-8.5'	13	3	76	5	1366	8	23	2	127	2	PPM	
7/11/2014	21:57	#15	Blank	<LOD	7	<LOD	1.5	<LOD	2.3	<LOD	6	4.4	0.9	PPM	
7/11/2014	21:59	#16	CCV	28	7	1650	15	5823	29	3606	23	4490	25	PPM	

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APPENDIX B
Laboratory Results and Data Quality Review

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APPENDIX B
CHEMICAL DATA QUALITY REVIEW AND LABORATORY REPORTS

This appendix presents the summary data quality review for the soil samples collected on July 10 through 12, 2014. Samples were submitted to OnSite Environmental laboratory (OnSite) in Redmond, Washington, for chemical analysis. Sixteen soil samples were analyzed for arsenic, chromium, copper, lead, and zinc by EPA Method 6010C and total suspended solids by Standard Method 2540D. Four soil samples were also analyzed for TCLP lead by EPA Method 1311/6010C. The same four samples were also analyzed for cadmium and mercury by EPA Methods 6010C and 7471B, respectively. Two soil samples were analyzed for semivolatile organic compounds (SVOCs) by EPA Method 8270D.

Onsite Data Package

The laboratory provided a summary report containing the sample results and associated quality assurance/quality control (QA/QC) data. The following samples are associated with OnSite job number 1407-099:

Sample ID	Laboratory ID
T1-C	07-099-01
T1-E-8’	07-099-02
T2-W-2’	07-099-03
T2-W-16’	07-099-04
T2-W-19’	07-099-05
T3-E-2’	07-099-06
T3-W-5’	07-099-07
T4-C	07-099-08
T4-E-11’	07-099-09
T4-W-11’	07-099-10
T5-C	07-099-11
T5-W-11’	07-099-12
T6-E-5’	07-099-13
T6-E-11’	07-099-14
B-N	07-099-15
B-W	07-099-16
SA-20-W	07-099-17
SA-9-W	07-099-18

Data Evaluation Process

Hart Crowser reviewed the analytical results provided by OnSite to assess: the precision, accuracy, representativeness, and completeness of the data; and the usability of the analytical data for project objectives. The data review is based on the Quality Control Requirements previously described and

follows the format of the EPA National Functional Guidelines for Inorganic and Organic Data Review modified to include specific criteria of individual analytical methods.

The data reviewer was required to do the following during the evaluation process:

- Verify that sample numbers and analyses match the chain of custody request;
- Verify sample preservation and holding times;
- Verify that laboratory blanks were performed at the proper frequency and that no analytes were present in the blanks;
- Verify that laboratory duplicates, matrix spikes, and laboratory control samples were run at the proper frequency and that control limits were met; and
- Verify that required reporting limits have been achieved.

Data Qualifier Flags

Results that were outside the QC acceptance criteria were flagged with data qualifiers as needed. The data qualifiers applied during the review are explained below.

U The compound was analyzed for but was not detected. The associated numerical value is the sample reporting limit.

Sampling Handling

Upon arrival at Onsite, the samples were inspected by the sample receiver, who compared the information on the sample jar labels to the chain-of-custody (COC) and measured the temperature of the cooler. The laboratory did not report any discrepancies in the COC or problems with the condition of the sample containers. The laboratory maintained the samples at a temperature of 2 to 4 degrees Celsius. All samples were analyzed within the required holding times.

Qualification of Data

All laboratory quality control measures (including laboratory blanks, laboratory duplicates, matrix spikes, and laboratory control samples) passed for all analytical tests. All of the soil data is usable without qualification.

All data from OnSite package 1407-099 are usable without qualification.

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

July 18, 2014

Anne Conrad
Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, WA 98109-3056

Re: Analytical Data for Project 17843-40
Laboratory Reference No. 1407-099

Dear Anne:

Enclosed are the analytical results and associated quality control data for samples submitted on July 14, 2014.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

Case Narrative

Samples were collected on July 10, 11, and 12, 2014 and received by the laboratory on July 14, 2014. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

TOTAL METALS
EPA 6010C

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	07-099-01					
Client ID:	**T1-C**					
Arsenic	**25**	14	6010C	7-15-14	7-15-14	
Chromium	**26**	0.68	6010C	7-15-14	7-15-14	
Copper	**45**	1.4	6010C	7-15-14	7-15-14	
Lead	**1800**	6.8	6010C	7-15-14	7-15-14	
Zinc	**150**	3.4	6010C	7-15-14	7-15-14	
Lab ID:	07-099-02					
Client ID:	**T1-E-8'**					
Arsenic	**17**	15	6010C	7-15-14	7-15-14	
Chromium	**22**	0.76	6010C	7-15-14	7-15-14	
Copper	**34**	1.5	6010C	7-15-14	7-15-14	
Lead	**350**	7.6	6010C	7-15-14	7-15-14	
Zinc	**120**	3.8	6010C	7-15-14	7-15-14	
Lab ID:	07-099-03					
Client ID:	**T2-W-2'**					
Arsenic	**ND**	15	6010C	7-15-14	7-15-14	
Chromium	**31**	0.73	6010C	7-15-14	7-15-14	
Copper	**25**	1.5	6010C	7-15-14	7-15-14	
Lead	**610**	7.3	6010C	7-15-14	7-15-14	
Zinc	**77**	3.6	6010C	7-15-14	7-15-14	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

TOTAL METALS
EPA 6010C

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	07-099-04					
Client ID:	**T2-W-16'**					
Arsenic	**ND**	12	6010C	7-15-14	7-15-14	
Chromium	**17**	0.59	6010C	7-15-14	7-15-14	
Copper	**20**	1.2	6010C	7-15-14	7-15-14	
Lead	**56**	5.9	6010C	7-15-14	7-15-14	
Zinc	**57**	2.9	6010C	7-15-14	7-15-14	
Lab ID:	07-099-05					
Client ID:	**T2-W-19'**					
Arsenic	**ND**	14	6010C	7-15-14	7-15-14	
Chromium	**16**	0.68	6010C	7-15-14	7-15-14	
Copper	**22**	1.4	6010C	7-15-14	7-15-14	
Lead	**25**	6.8	6010C	7-15-14	7-15-14	
Zinc	**57**	3.4	6010C	7-15-14	7-15-14	
Lab ID:	07-099-06					
Client ID:	**T3-E-2'**					
Arsenic	**ND**	17	6010C	7-15-14	7-15-14	
Chromium	**30**	0.85	6010C	7-15-14	7-15-14	
Copper	**26**	1.7	6010C	7-15-14	7-15-14	
Lead	**1200**	8.5	6010C	7-15-14	7-15-14	
Zinc	**91**	4.2	6010C	7-15-14	7-15-14	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

TOTAL METALS
EPA 6010C

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	07-099-07					
Client ID:	**T3-W-5'**					
Arsenic	**20**	12	6010C	7-15-14	7-15-14	
Chromium	**24**	0.60	6010C	7-15-14	7-15-14	
Copper	**33**	1.2	6010C	7-15-14	7-15-14	
Lead	**480**	6.0	6010C	7-15-14	7-15-14	
Zinc	**79**	3.0	6010C	7-15-14	7-15-14	
Lab ID:	07-099-08					
Client ID:	**T4-C**					
Arsenic	**ND**	13	6010C	7-15-14	7-15-14	
Chromium	**40**	0.65	6010C	7-15-14	7-15-14	
Copper	**16**	1.3	6010C	7-15-14	7-15-14	
Lead	**1000**	6.5	6010C	7-15-14	7-15-14	
Zinc	**55**	3.3	6010C	7-15-14	7-15-14	
Lab ID:	07-099-09					
Client ID:	**T4-E-11'**					
Arsenic	**ND**	12	6010C	7-15-14	7-15-14	
Chromium	**22**	0.61	6010C	7-15-14	7-15-14	
Copper	**18**	1.2	6010C	7-15-14	7-15-14	
Lead	**9.6**	6.1	6010C	7-15-14	7-15-14	
Zinc	**54**	3.1	6010C	7-15-14	7-15-14	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

TOTAL METALS
EPA 6010C

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	07-099-10					
Client ID:	**T4-W-11'**					
Arsenic	**ND**	13	6010C	7-15-14	7-15-14	
Chromium	**18**	0.65	6010C	7-15-14	7-15-14	
Copper	**16**	1.3	6010C	7-15-14	7-15-14	
Lead	**70**	6.5	6010C	7-15-14	7-15-14	
Zinc	**60**	3.2	6010C	7-15-14	7-15-14	
Lab ID:	07-099-11					
Client ID:	**T5-C**					
Arsenic	**ND**	15	6010C	7-15-14	7-15-14	
Chromium	**20**	0.77	6010C	7-15-14	7-15-14	
Copper	**25**	1.5	6010C	7-15-14	7-15-14	
Lead	**1300**	7.7	6010C	7-15-14	7-15-14	
Zinc	**210**	3.9	6010C	7-15-14	7-15-14	
Lab ID:	07-099-12					
Client ID:	**T5-W-11'**					
Arsenic	**ND**	14	6010C	7-15-14	7-15-14	
Chromium	**12**	0.72	6010C	7-15-14	7-15-14	
Copper	**26**	1.4	6010C	7-15-14	7-15-14	
Lead	**950**	7.2	6010C	7-15-14	7-15-14	
Zinc	**68**	3.6	6010C	7-15-14	7-15-14	

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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

TOTAL METALS
EPA 6010C

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	07-099-13					
Client ID:	**T6-E-5'**					
Arsenic	**ND**	20	6010C	7-15-14	7-15-14	
Chromium	**15**	1.0	6010C	7-15-14	7-15-14	
Copper	**14**	2.0	6010C	7-15-14	7-15-14	
Lead	**2000**	10	6010C	7-15-14	7-15-14	
Zinc	**180**	5.1	6010C	7-15-14	7-15-14	
Lab ID:	07-099-14					
Client ID:	**T6-E-11'**					
Arsenic	**ND**	14	6010C	7-15-14	7-15-14	
Chromium	**19**	1.4	6010C	7-15-14	7-15-14	
Copper	**47**	2.8	6010C	7-15-14	7-15-14	
Lead	**1600**	14	6010C	7-15-14	7-15-14	
Zinc	**210**	6.9	6010C	7-15-14	7-15-14	
Lab ID:	07-099-15					
Client ID:	**B-N**					
Arsenic	**ND**	13	6010C	7-15-14	7-15-14	
Chromium	**26**	0.64	6010C	7-15-14	7-15-14	
Copper	**11**	1.3	6010C	7-15-14	7-15-14	
Lead	**12**	6.4	6010C	7-15-14	7-15-14	
Zinc	**77**	3.2	6010C	7-15-14	7-15-14	

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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

TOTAL METALS
EPA 6010C

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	07-099-16					
Client ID:	**B-W**					
Arsenic	**ND**	12	6010C	7-15-14	7-15-14	
Chromium	**11**	0.60	6010C	7-15-14	7-15-14	
Copper	**11**	1.2	6010C	7-15-14	7-15-14	
Lead	**42**	6.0	6010C	7-15-14	7-15-14	
Zinc	**39**	3.0	6010C	7-15-14	7-15-14	

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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

TOTAL METALS
EPA 6010C
METHOD BLANK QUALITY CONTROL

Date Extracted:	7-15-14
Date Analyzed:	7-15-14
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0715SM1

Analyte	Method	Result	PQL
Arsenic	6010C	**ND**	5.0
Chromium	6010C	**ND**	0.50
Copper	6010C	**ND**	1.0
Lead	6010C	**ND**	5.0
Zinc	6010C	**ND**	2.5

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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

TOTAL METALS
EPA 6010C
DUPLICATE QUALITY CONTROL

Date Extracted: 7-15-14
Date Analyzed: 7-15-14

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-094-14

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Arsenic	**ND**	**ND**	NA	5	
Chromium	**18.7**	**16.1**	15	0.50	
Copper	**8.10**	**8.00**	1	1.0	
Lead	**ND**	**ND**	NA	5.0	
Zinc	**21.1**	**21.5**	2	2.5	

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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

TOTAL METALS
EPA 6010C
MS/MSD QUALITY CONTROL

Date Extracted: 7-15-14
Date Analyzed: 7-15-14

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-094-14

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Arsenic	100	**100**	100	**94.6**	95	6	
Chromium	100	**117**	99	**113**	94	4	
Copper	50.0	**68.4**	121	**58.3**	100	16	
Lead	250	**256**	102	**241**	97	6	
Zinc	100	**131**	110	**124**	102	6	

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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

TOTAL METALS
EPA 6010C
SPIKE BLANK QUALITY CONTROL

Date Extracted: 7-15-14
Date Analyzed: 7-15-14

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: SB0715SM1

Analyte	Method	Spike Level	SB Result	Percent Recovery
Arsenic	6010C	100	**88.9**	89
Chromium	6010C	100	**97.6**	98
Copper	6010C	50.0	**50.2**	100
Lead	6010C	250	**240**	96
Zinc	6010C	100	**105**	105

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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

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Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SA-20-W**					
Laboratory ID:	07-099-17					
n-Nitrosodimethylamine	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Pyridine	**ND**	0.41	EPA 8270D	7-14-14	7-16-14	
Phenol	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Aniline	**ND**	0.20	EPA 8270D	7-14-14	7-16-14	
bis(2-Chloroethyl)ether	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2-Chlorophenol	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
1,3-Dichlorobenzene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
1,4-Dichlorobenzene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Benzyl alcohol	**ND**	0.20	EPA 8270D	7-14-14	7-16-14	
1,2-Dichlorobenzene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2-Methylphenol (o-Cresol)	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
bis(2-Chloroisopropyl)ether	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
n-Nitroso-di-n-propylamine	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Hexachloroethane	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Nitrobenzene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Isophorone	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2-Nitrophenol	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2,4-Dimethylphenol	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
bis(2-Chloroethoxy)methane	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2,4-Dichlorophenol	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
1,2,4-Trichlorobenzene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Naphthalene	**ND**	0.0081	EPA 8270D/SIM	7-14-14	7-16-14	
4-Chloroaniline	**ND**	0.20	EPA 8270D	7-14-14	7-16-14	
Hexachlorobutadiene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
4-Chloro-3-methylphenol	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2-Methylnaphthalene	**ND**	0.0081	EPA 8270D/SIM	7-14-14	7-16-14	
1-Methylnaphthalene	**ND**	0.0081	EPA 8270D/SIM	7-14-14	7-16-14	
Hexachlorocyclopentadiene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2,4,6-Trichlorophenol	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2,3-Dichloroaniline	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2,4,5-Trichlorophenol	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2-Chloronaphthalene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2-Nitroaniline	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
1,4-Dinitrobenzene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Dimethylphthalate	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
1,3-Dinitrobenzene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2,6-Dinitrotoluene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
1,2-Dinitrobenzene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Acenaphthylene	**0.034**	0.0081	EPA 8270D/SIM	7-14-14	7-16-14	
3-Nitroaniline	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	

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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
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Project: 17843-40

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Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SA-20-W**					
Laboratory ID:	07-099-17					
2,4-Dinitrophenol	**ND**	0.20	EPA 8270D	7-14-14	7-16-14	
Acenaphthene	**ND**	0.0081	EPA 8270D/SIM	7-14-14	7-16-14	
4-Nitrophenol	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2,4-Dinitrotoluene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Dibenzofuran	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2,3,5,6-Tetrachlorophenol	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
2,3,4,6-Tetrachlorophenol	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Diethylphthalate	**ND**	0.20	EPA 8270D	7-14-14	7-16-14	
4-Chlorophenyl-phenylether	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
4-Nitroaniline	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Fluorene	**0.014**	0.0081	EPA 8270D/SIM	7-14-14	7-16-14	
4,6-Dinitro-2-methylphenol	**ND**	0.20	EPA 8270D	7-14-14	7-16-14	
n-Nitrosodiphenylamine	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
1,2-Diphenylhydrazine	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
4-Bromophenyl-phenylether	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Hexachlorobenzene	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Pentachlorophenol	**ND**	0.20	EPA 8270D	7-14-14	7-16-14	
Phenanthrene	**0.038**	0.0081	EPA 8270D/SIM	7-14-14	7-16-14	
Anthracene	**0.065**	0.041	EPA 8270D	7-14-14	7-16-14	
Carbazole	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Di-n-butylphthalate	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Fluoranthene	**0.61**	0.041	EPA 8270D	7-14-14	7-16-14	
Benzidine	**ND**	0.41	EPA 8270D	7-14-14	7-16-14	
Pyrene	**0.70**	0.041	EPA 8270D	7-14-14	7-16-14	
Butylbenzylphthalate	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
bis-2-Ethylhexyladipate	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
3,3'-Dichlorobenzidine	**ND**	0.20	EPA 8270D	7-14-14	7-16-14	
Benzo[a]anthracene	**0.27**	0.041	EPA 8270D	7-14-14	7-16-14	
Chrysene	**0.41**	0.041	EPA 8270D	7-14-14	7-16-14	
bis(2-Ethylhexyl)phthalate	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Di-n-octylphthalate	**ND**	0.041	EPA 8270D	7-14-14	7-16-14	
Benzo[b]fluoranthene	**0.40**	0.041	EPA 8270D	7-14-14	7-16-14	
Benzo(j,k)fluoranthene	**0.13**	0.041	EPA 8270D	7-14-14	7-16-14	
Benzo[a]pyrene	**0.17**	0.041	EPA 8270D	7-14-14	7-16-14	
Indeno[1,2,3-cd]pyrene	**0.081**	0.041	EPA 8270D	7-14-14	7-16-14	
Dibenz[a,h]anthracene	**0.035**	0.0081	EPA 8270D/SIM	7-14-14	7-16-14	
Benzo[g,h,i]perylene	**0.079**	0.041	EPA 8270D	7-14-14	7-16-14	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*57*	*24 - 105*				
Phenol-d6	*58*	*34 - 101*				
Nitrobenzene-d5	*58*	*32 - 102*				
2-Fluorobiphenyl	*68*	*44 -100*				
2,4,6-Tribromophenol	*63*	*34 - 124*				
Terphenyl-d14	*66*	*47 - 114*				

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Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

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Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SA-9-W**					
Laboratory ID:	07-099-18					
n-Nitrosodimethylamine	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Pyridine	**ND**	0.46	EPA 8270D	7-14-14	7-16-14	
Phenol	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Aniline	**ND**	0.23	EPA 8270D	7-14-14	7-16-14	
bis(2-Chloroethyl)ether	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2-Chlorophenol	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
1,3-Dichlorobenzene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
1,4-Dichlorobenzene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Benzyl alcohol	**2.1**	0.23	EPA 8270D	7-14-14	7-16-14	
1,2-Dichlorobenzene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2-Methylphenol (o-Cresol)	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
bis(2-Chloroisopropyl)ether	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
(3+4)-Methylphenol (m,p-Cresol)	**0.062**	0.046	EPA 8270D	7-14-14	7-16-14	
n-Nitroso-di-n-propylamine	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Hexachloroethane	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Nitrobenzene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Isophorone	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2-Nitrophenol	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2,4-Dimethylphenol	**0.069**	0.046	EPA 8270D	7-14-14	7-16-14	
bis(2-Chloroethoxy)methane	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2,4-Dichlorophenol	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
1,2,4-Trichlorobenzene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Naphthalene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
4-Chloroaniline	**ND**	0.23	EPA 8270D	7-14-14	7-16-14	
Hexachlorobutadiene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
4-Chloro-3-methylphenol	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2-Methylnaphthalene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
1-Methylnaphthalene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Hexachlorocyclopentadiene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2,4,6-Trichlorophenol	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2,3-Dichloroaniline	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2,4,5-Trichlorophenol	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2-Chloronaphthalene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2-Nitroaniline	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
1,4-Dinitrobenzene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Dimethylphthalate	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
1,3-Dinitrobenzene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2,6-Dinitrotoluene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
1,2-Dinitrobenzene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Acenaphthylene	**0.46**	0.046	EPA 8270D	7-14-14	7-16-14	
3-Nitroaniline	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	

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Laboratory Reference: 1407-099
Project: 17843-40

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Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SA-9-W**					
Laboratory ID:	07-099-18					
2,4-Dinitrophenol	**ND**	0.23	EPA 8270D	7-14-14	7-16-14	
Acenaphthene	**0.12**	0.046	EPA 8270D	7-14-14	7-16-14	
4-Nitrophenol	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2,4-Dinitrotoluene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Dibenzofuran	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2,3,5,6-Tetrachlorophenol	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
2,3,4,6-Tetrachlorophenol	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Diethylphthalate	**ND**	0.23	EPA 8270D	7-14-14	7-16-14	
4-Chlorophenyl-phenylether	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
4-Nitroaniline	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Fluorene	**0.17**	0.046	EPA 8270D	7-14-14	7-16-14	
4,6-Dinitro-2-methylphenol	**ND**	0.23	EPA 8270D	7-14-14	7-16-14	
n-Nitrosodiphenylamine	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
1,2-Diphenylhydrazine	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
4-Bromophenyl-phenylether	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Hexachlorobenzene	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Pentachlorophenol	**ND**	0.23	EPA 8270D	7-14-14	7-16-14	
Phenanthrene	**0.95**	0.046	EPA 8270D	7-14-14	7-16-14	
Anthracene	**1.5**	0.046	EPA 8270D	7-14-14	7-16-14	
Carbazole	**0.36**	0.046	EPA 8270D	7-14-14	7-16-14	
Di-n-butylphthalate	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Fluoranthene	**12**	0.46	EPA 8270D	7-14-14	7-16-14	
Benzidine	**ND**	0.46	EPA 8270D	7-14-14	7-16-14	
Pyrene	**14**	0.46	EPA 8270D	7-14-14	7-16-14	
Butylbenzylphthalate	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
bis-2-Ethylhexyladipate	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
3,3'-Dichlorobenzidine	**ND**	0.23	EPA 8270D	7-14-14	7-16-14	
Benzo[a]anthracene	**5.5**	0.46	EPA 8270D	7-14-14	7-16-14	
Chrysene	**7.3**	0.46	EPA 8270D	7-14-14	7-16-14	
bis(2-Ethylhexyl)phthalate	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Di-n-octylphthalate	**ND**	0.046	EPA 8270D	7-14-14	7-16-14	
Benzo[b]fluoranthene	**6.6**	0.46	EPA 8270D	7-14-14	7-16-14	
Benzo(j,k)fluoranthene	**1.2**	0.046	EPA 8270D	7-14-14	7-16-14	
Benzo[a]pyrene	**2.5**	0.046	EPA 8270D	7-14-14	7-16-14	
Indeno[1,2,3-cd]pyrene	**0.98**	0.046	EPA 8270D	7-14-14	7-16-14	
Dibenz[a,h]anthracene	**0.37**	0.046	EPA 8270D	7-14-14	7-16-14	
Benzo[g,h,i]perylene	**0.98**	0.046	EPA 8270D	7-14-14	7-16-14	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*25*	*24 - 105*				
Phenol-d6	*36*	*34 - 101*				
Nitrobenzene-d5	*38*	*32 - 102*				
2-Fluorobiphenyl	*45*	*44 -100*				
2,4,6-Tribromophenol	*51*	*34 - 124*				
Terphenyl-d14	*48*	*47 - 114*				

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

SEMIVOLATILES EPA 8270D/SIM
METHOD BLANK QUALITY CONTROL
page 1 of 2

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0714S1					
n-Nitrosodimethylamine	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Pyridine	**ND**	0.33	EPA 8270D	7-14-14	7-15-14	
Phenol	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Aniline	**ND**	0.17	EPA 8270D	7-14-14	7-15-14	
bis(2-Chloroethyl)ether	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2-Chlorophenol	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
1,3-Dichlorobenzene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
1,4-Dichlorobenzene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Benzyl alcohol	**ND**	0.17	EPA 8270D	7-14-14	7-15-14	
1,2-Dichlorobenzene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2-Methylphenol (o-Cresol)	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
bis(2-Chloroisopropyl)ether	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
n-Nitroso-di-n-propylamine	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Hexachloroethane	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Nitrobenzene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Isophorone	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2-Nitrophenol	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2,4-Dimethylphenol	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
bis(2-Chloroethoxy)methane	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2,4-Dichlorophenol	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
1,2,4-Trichlorobenzene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Naphthalene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
4-Chloroaniline	**ND**	0.17	EPA 8270D	7-14-14	7-15-14	
Hexachlorobutadiene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
4-Chloro-3-methylphenol	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2-Methylnaphthalene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
1-Methylnaphthalene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Hexachlorocyclopentadiene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2,4,6-Trichlorophenol	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2,3-Dichloroaniline	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2,4,5-Trichlorophenol	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2-Chloronaphthalene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2-Nitroaniline	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
1,4-Dinitrobenzene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Dimethylphthalate	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
1,3-Dinitrobenzene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2,6-Dinitrotoluene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
1,2-Dinitrobenzene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Acenaphthylene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
3-Nitroaniline	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	

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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

SEMIVOLATILES EPA 8270D/SIM
METHOD BLANK QUALITY CONTROL
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0714S1					
2,4-Dinitrophenol	**ND**	0.17	EPA 8270D	7-14-14	7-15-14	
Acenaphthene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
4-Nitrophenol	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2,4-Dinitrotoluene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Dibenzofuran	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2,3,5,6-Tetrachlorophenol	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
2,3,4,6-Tetrachlorophenol	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Diethylphthalate	**ND**	0.17	EPA 8270D	7-14-14	7-15-14	
4-Chlorophenyl-phenylether	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
4-Nitroaniline	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Fluorene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
4,6-Dinitro-2-methylphenol	**ND**	0.17	EPA 8270D	7-14-14	7-15-14	
n-Nitrosodiphenylamine	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
1,2-Diphenylhydrazine	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
4-Bromophenyl-phenylether	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Hexachlorobenzene	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Pentachlorophenol	**ND**	0.17	EPA 8270D	7-14-14	7-15-14	
Phenanthrene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Anthracene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Carbazole	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Di-n-butylphthalate	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Fluoranthene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Benzidine	**ND**	0.33	EPA 8270D	7-14-14	7-15-14	
Pyrene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Butylbenzylphthalate	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
bis-2-Ethylhexyladipate	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
3,3'-Dichlorobenzidine	**ND**	0.17	EPA 8270D	7-14-14	7-15-14	
Benzo[a]anthracene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Chrysene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
bis(2-Ethylhexyl)phthalate	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Di-n-octylphthalate	**ND**	0.033	EPA 8270D	7-14-14	7-15-14	
Benzo[b]fluoranthene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Benzo(j,k)fluoranthene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Benzo[a]pyrene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Indeno[1,2,3-cd]pyrene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Dibenz[a,h]anthracene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Benzo[g,h,i]perylene	**ND**	0.0067	EPA 8270D/SIM	7-14-14	7-16-14	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*74*	*24 - 105*				
Phenol-d6	*73*	*34 - 101*				
Nitrobenzene-d5	*70*	*32 - 102*				
2-Fluorobiphenyl	*70*	*44 -100*				
2,4,6-Tribromophenol	*67*	*34 - 124*				
Terphenyl-d14	*72*	*47 - 114*				

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

SEMIVOLATILES EPA 8270D/SIM
SB/SBD QUALITY CONTROL

Matrix: Soil
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0714S1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**0.855**	**1.15**	1.33	1.33	64	86	41 - 104	29	36	
2-Chlorophenol	**0.827**	**1.10**	1.33	1.33	62	83	41 - 100	28	42	
1,4-Dichlorobenzene	**0.351**	**0.500**	0.667	0.667	53	75	34 - 100	35	48	
n-Nitroso-di-n-propylamine	**0.393**	**0.471**	0.667	0.667	59	71	41 - 98	18	30	
1,2,4-Trichlorobenzene	**0.403**	**0.513**	0.667	0.667	60	77	30 - 105	24	46	
4-Chloro-3-methylphenol	**0.955**	**1.15**	1.33	1.33	72	86	57 - 101	19	27	
Acenaphthene	**0.372**	**0.447**	0.667	0.667	56	67	56 - 95	18	22	
4-Nitrophenol	**0.938**	**1.15**	1.33	1.33	71	86	41 - 133	20	24	
2,4-Dinitrotoluene	**0.426**	**0.521**	0.667	0.667	64	78	63 - 110	20	23	
Pentachlorophenol	**0.811**	**0.934**	1.33	1.33	61	70	35 - 120	14	29	
Pyrene	**0.456**	**0.532**	0.667	0.667	68	80	56 - 114	15	25	
Surrogate:										
2-Fluorophenol					*57*	*78*	*24 - 105*			
Phenol-d6					*63*	*80*	*34 - 101*			
Nitrobenzene-d5					*56*	*72*	*32 - 102*			
2-Fluorobiphenyl					*61*	*75*	*44 -100*			
2,4,6-Tribromophenol					*65*	*76*	*34 - 124*			
Terphenyl-d14					*67*	*77*	*47 - 114*			

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Date of Report: July 18, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099
Project: 17843-40

% MOISTURE

Date Analyzed: 7-14&15-14

Client ID	Lab ID	% Moisture
T1-C	07-099-01	27
T1-E-8'	07-099-02	34
T2-W-2'	07-099-03	31
T2-W-16'	07-099-04	15
T2-W-19'	07-099-05	27
T3-E-2'	07-099-06	41
T3-W-5'	07-099-07	16
T4-C	07-099-08	23
T4-E-11'	07-099-09	19
T4-W-11'	07-099-10	23
T5-C	07-099-11	35
T5-W-11'	07-099-12	30
T6-E-5'	07-099-13	51
T6-E-11'	07-099-14	64
B-N	07-099-15	21
B-W	07-099-16	17
SA-20-W	07-099-17	18
SA-9-W	07-099-18	28

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OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Sample Custody Record

1 of 2

Samples Shipped to: ON SITE

HARTCROWSER

Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Office: 206.324.9530 • Fax 206.328.5581

JOB 17843-40 LAB NUMBER 07-099

PROJECT NAME # SCL - NEWHALEM

HART CROWSER CONTACT A. CONRAD, R. McGINNIS, R. STAINSBY

SAMPLED BY:

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	As, Cr, Cu, Pb, Zn	TOTAL SOLIDS	DS	DRY WT STUDY	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
1	T1-C		7/10/14	1741	S	X	X		X	1	
2	T1-E-8'		7/12/14	0854		X	X			1	
3	T2-W-2'		"	0858		X	X			1	
4	T2-W-16'		7/11/14	0933		X	X			1	
5	T2-W-19'		"	0945		X	X			1	
6	T3-E-2'		"	1723		X	X			1	
7	T3-W-5'		"	1725		X	X			1	
8	T4-C		"	1500		X	X			1	
9	T4-E-11'		"	1608		X	X			1	
10	T4-W-11'		"	1544		X	X			1	
11	T5-C		"	1153		X	X			1	
12	T5-W-11'		"	1210		X	X			1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	7/14/14	SIGNATURE	7/14/14
PRINT NAME Anne Cones	TIME	PRINT NAME	TIME
COMPANY Hart Crowser	0848	COMPANY HC	0848

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

12 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE _____
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐48 HOURS ☒STANDARD
☐72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

2 OF 2

Samples Shipped to: ONSITE

HARTCROWSER

Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Office: 206.324.9530 • Fax 206.328.5581

JOB 17843-40 LAB NUMBER 07-099

PROJECT NAME SCL- NEWHALEM

HART CROWSER CONTACT A. CONRAD

SAMPLED BY: R. McGINNIS R. STANSBERY

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	As, Cr, Cu, Pb, Zn	TOTAL SOLIDS	EPA 8270D-SVOC	GEOTECHNICAL	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
13	T6-E-5'		7/14/14	1104	S	X	X		X	1	
14	T6-E-11'		"	1113		X	X			1	
15	B-N		"	1805		X	X			1	
16	B-W		"	1731		X	X			1	
17	SA-20-W		"	1743			X	X		1	
18	SA-9-W		"	1749			X	X		1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	7/14/14	SIGNATURE	7/14/14
PRINT NAME Anne Conrad	TIME	PRINT NAME KWSOW	TIME
COMPANY HC	0848	COMPANY HC	0848

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

6 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE _____
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐48 HOURS ☒STANDARD
☐72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

July 29, 2014

Anne Conrad
Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, WA 98109-3056

Re: Analytical Data for Project 17843-40
Laboratory Reference No. 1407-099B

Dear Anne:

Enclosed are the analytical results and associated quality control data for samples submitted on July 14, 2014.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: July 29, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099B
Project: 17843-40

Case Narrative

Samples were collected on July 10, 11, and 12, 2014 and received by the laboratory on July 14, 2014. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

TCLP Lead EPA 1311/6010C Analysis

Due to a limited amount of sample, less than the required 100g was tumbled for TCLP analysis. The amount of sample used was 90g for sample T1-C (07-099-01), 68g for sampleT6-E-5' (07-099-13), and 50g for sample T6-E-11' (07-099-14).

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

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Date of Report: July 29, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099B
Project: 17843-40

TCLP LEAD
EPA 1311/6010C

Matrix: TCLP Extract
Units: mg/L (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	07-099-01					
Client ID:	**T1-C**					
Lead	**4.3**	0.20	6010C	7-24-14	7-24-14	
Lab ID:	07-099-11					
Client ID:	**T5-C**					
Lead	**1.2**	0.20	6010C	7-24-14	7-24-14	
Lab ID:	07-099-13					
Client ID:	**T6-E-5'**					
Lead	**0.49**	0.20	6010C	7-24-14	7-24-14	
Lab ID:	07-099-14					
Client ID:	**T6-E-11'**					
Lead	**ND**	0.20	6010C	7-24-14	7-24-14	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: July 29, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099B
Project: 17843-40

TCLP LEAD
EPA 1311/6010C
METHOD BLANK QUALITY CONTROL

Date Prepared:	7-23-14
Date Extracted:	7-24-14
Date Analyzed:	7-24-14
Matrix:	TCLP Extract
Units:	mg/L (ppm)
Lab ID:	MB0724TM1

Analyte	Method	Result	PQL
Lead	6010C	**ND**	0.20

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: July 29, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099B
Project: 17843-40

TCLP LEAD
EPA 1311/6010C
DUPLICATE QUALITY CONTROL

Date Prepared:	7-23-14
Date Extracted:	7-24-14
Date Analyzed:	7-24-14
Matrix:	TCLP Extract
Units:	mg/L (ppm)
Lab ID:	07-171-01

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Lead	**ND**	**ND**	NA	0.20	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: July 29, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099B
Project: 17843-40

TCLP LEAD
EPA 1311/6010C
MS/MSD QUALITY CONTROL

Date Prepared:	7-23-14
Date Extracted:	7-24-14
Date Analyzed:	7-24-14
Matrix:	TCLP Extract
Units:	mg/L (ppm)
Lab ID:	07-171-01

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Lead	10.0	**8.83**	88	**8.90**	89	1	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Sample Custody Record

Samples Shipped to: ON SITE

1 of 2

HARTCROWSER

Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Office: 206.324.9530 • Fax 206.328.5581

JOB 17843-40 LAB NUMBER 07-099

PROJECT NAME # SCL - NEWHALEM

HART CROWSER CONTACT A. CONRAD, R. McGINNIS, R. STAINSBY

SAMPLED BY:

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	As, Cr, Cu, Pb, Zn	TOTAL SOLIDS	DB	TCLP Pb								TOTAL SOLIDS	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
1	T1-C		7/10/14	1741	S	X	X		(X)								X	1	
2	T1-E-8'		7/12/14	0854		X	X											1	
3	T2-W-2'		"	0858		X	X											1	
4	T2-W-16'		7/11/14	0933		X	X											1	
5	T2-W-19'		"	0945		X	X											1	
6	T3-E-2'		"	1723		X	X											1	
7	T3-W-5'		"	1725		X	X											1	
8	T4-C		"	1500		X	X											1	
9	T4-E-11'		"	1608		X	X											1	
10	T4-W-11'		"	1544		X	X											1	
11	T5-C		"	1153		X	X		(X)									1	
12	T5-W-11'		"	1210		X	X											1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	7/14/14	SIGNATURE	7/14/14
PRINT NAME Anne Comes	TIME	PRINT NAME	TIME
COMPANY Hart Crowser	0848	COMPANY OSE	0848

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

(X) Added 7/21/14 BC STA

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

12 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION

CUSTODY SEALS: ☐YES ☐NO ☐N/A

GOOD CONDITION ☐YES ☐NO

TEMPERATURE _____

SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:

☐ 24 HOURS ☐ 1 WEEK

☐48 HOURS ☒STANDARD

☐72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

Samples Shipped to: ONSITE

2 OF 2

HARTCROWSER

Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Office: 206.324.9530 • Fax 206.328.5581

JOB 17843-40 LAB NUMBER 07-099

PROJECT NAME SCL- NEWHALEM

HART CROWSER CONTACT A. CONRAD

SAMPLED BY: R. McGINNIS, R. STAINSBY

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	As, Cr, Cu, Pb, Zn	~~TOTAL SOLIDS~~	EPA 8270D-SVOC		TCLP Pb							COMPOSITE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
13	T6-E-5'		7/14/14	1104	S	X	X			X							X	1	
14	T6-E-11'		"	1113		X	X			X								1	
15	B-N		"	1805		X	X											1	
16	B-W		"	1731		X	X											1	
17	SA-20-W		"	1743			X	X										1	
18	SA-9-W		"	1749			X	X										1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	7/14/14	SIGNATURE	7/14/14
PRINT NAME Anne Conrad	TIME	PRINT NAME	TIME
COMPANY Hart Crowser	0848	COMPANY ONSITE	0848

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

6 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE _____
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐48 HOURS ☒STANDARD
☐72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

August 12, 2014

Anne Conrad
Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, WA 98109-3056

Re: Analytical Data for Project 17843-40
Laboratory Reference No. 1407-099C

Dear Anne:

Enclosed are the analytical results and associated quality control data for samples submitted on July 14, 2014.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 12, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099C
Project: 17843-40

Case Narrative

Samples were collected on July 10, 11, and 12, 2014 and received by the laboratory on July 14, 2014. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 12, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099C
Project: 17843-40

TOTAL METALS
EPA 6010C/7471B

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	07-099-01					
Client ID:	**T1-C**					
Cadmium	**ND**	0.68	6010C	7-15-14	7-15-14	
Mercury	**ND**	0.34	7471B	8-6-14	8-7-14	
Lab ID:	07-099-11					
Client ID:	**T5-C**					
Cadmium	**ND**	0.77	6010C	7-15-14	7-15-14	
Mercury	**ND**	0.39	7471B	8-6-14	8-7-14	
Lab ID:	07-099-13					
Client ID:	**T6-E-5'**					
Cadmium	**ND**	1.0	6010C	7-15-14	7-15-14	
Mercury	**ND**	0.51	7471B	8-6-14	8-7-14	
Lab ID:	07-099-14					
Client ID:	**T6-E-11'**					
Cadmium	**ND**	1.4	6010C	7-15-14	7-15-14	
Mercury	**ND**	0.69	7471B	8-6-14	8-7-14	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 12, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099C
Project: 17843-40

TOTAL CADMIUM
EPA 6010C
METHOD BLANK QUALITY CONTROL

Date Extracted: 7-15-14
Date Analyzed: 7-15-14

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: MB0715SM1

Analyte	Method	Result	PQL
Cadmium	6010C	**ND**	0.50

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 12, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099C
Project: 17843-40

TOTAL MERCURY
EPA 7471B
METHOD BLANK QUALITY CONTROL

Date Extracted:	8-6-14
Date Analyzed:	8-7-14
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0806S2

Analyte	Method	Result	PQL
Mercury	7471B	**ND**	0.25

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 12, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099C
Project: 17843-40

TOTAL CADMIUM
EPA 6010C
DUPLICATE QUALITY CONTROL

Date Extracted: 7-15-14
Date Analyzed: 7-15-14

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-094-14

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Cadmium	**ND**	**ND**	NA	0.50	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 12, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099C
Project: 17843-40

TOTAL MERCURY
EPA 7471B
DUPLICATE QUALITY CONTROL

Date Extracted: 8-6-14
Date Analyzed: 8-7-14

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 08-019-01

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Mercury	**ND**	**ND**	NA	0.25	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 12, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099C
Project: 17843-40

TOTAL CADMIUM
EPA 6010C
MS/MSD QUALITY CONTROL

Date Extracted: 7-15-14
Date Analyzed: 7-15-14

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-094-14

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Cadmium	50.0	**51.6**	103	**48.3**	97	7	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 12, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099C
Project: 17843-40

TOTAL MERCURY
EPA 7471B
MS/MSD QUALITY CONTROL

Date Extracted: 8-6-14
Date Analyzed: 8-7-14

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 08-019-01

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Mercury	0.500	**0.457**	91	**0.453**	91	1	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 12, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099C
Project: 17843-40

TOTAL CADMIUM
EPA 6010C
SPIKE BLANK QUALITY CONTROL

Date Extracted: 7-15-14
Date Analyzed: 7-15-14

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: SB0715SM1

Analyte	Method	Spike Level	SB Result	Percent Recovery
Cadmium	6010C	50.0	**46.5**	93

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 12, 2014
Samples Submitted: July 14, 2014
Laboratory Reference: 1407-099C
Project: 17843-40

TOTAL MERCURY
EPA 7471B
SPIKE BLANK QUALITY CONTROL

Date Extracted: 8-6-14
Date Analyzed: 8-7-14

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: SB0806S2

Analyte	Method	Spike Level	SB Result	Percent Recovery
Mercury	7471B	0.500	**0.523**	105

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Sample Custody Record

Samples Shipped to: ON SITE

1 of 2

HARTCROWSER

Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Office: 206.324.9530 • Fax 206.328.5581

JOB 17843-40 LAB NUMBER 07-099

PROJECT NAME # SCL - NEWHALEM

HART CROWSER CONTACT A. CONRAD, R. McGINNIS, R. STAINSBY

SAMPLED BY: A

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	As, Cr, Cu, Pb, Zn	TOTAL SOLIDS	DB	TCLP Pb		TOTAL Cd, Hg						TOTAL SOLIDS	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
1	T1-C		7/10/14	1741	S	X	X		⊗		O						X	1	
2	T1-E-8'		7/12/14	0854		X	X											1	
3	T2-W-2'		"	0858		X	X											1	
4	T2-W-16'		7/11/14	0933		X	X											1	
5	T2-W-19'		"	0945		X	X											1	
6	T3-E-2'		"	1723		X	X											1	
7	T3-W-5'		"	1725		X	X											1	
8	T4-C		"	1500		X	X											1	
9	T4-E-11'		"	1608		X	X											1	
10	T4-W-11'		"	1544		X	X											1	
11	T5-C		"	1153		X	X		⊗		O							1	
12	T5-W-11'		"	1210		X	X											1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	7/14/14	SIGNATURE	7/14/14
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY	0848	COMPANY	0848

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

⊗ Added 7/21/14 BC STA

O Added 8/5/14. DB (STA)

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

12 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION

CUSTODY SEALS: ☐YES ☐NO ☐N/A

GOOD CONDITION ☐YES ☐NO

TEMPERATURE _____

SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:

☐ 24 HOURS ☐ 1 WEEK

☐48 HOURS ☒STANDARD

☐72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

2 of 2

Samples Shipped to: ONSITE

HARTCROWSER

Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Office: 206.324.9530 • Fax 206.328.5581

JOB 17843-40 LAB NUMBER 07-099

PROJECT NAME SCL - NEWHALEM

HART CROWSER CONTACT A. CONRAD

SAMPLED BY: R. McGINNIS, R. STANSBY

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	As, Cr, Cu, Pb, Zn	~~Total Solids~~	EPA 8270D-SVOC	TCLP Pb	Total Cd, Hg					Composite	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
13	T6-E-5'		7/14/14	1104	S	X	X		X	O					O	1	
14	T6-E-11'		"	1113		X	X		X	O						1	
15	B-N		"	1805		X	X									1	
16	B-W		"	1731		X	X									1	
17	SA-20-W		"	1743			X	X								1	
18	SA-9-W		"	1749			X	X								1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	7/14/14	SIGNATURE	7/14/14
PRINT NAME Anne Conrad	TIME	PRINT NAME	TIME
COMPANY Hart Crowser	0848	COMPANY OSE	0848

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

6 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE _____
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐48 HOURS ☒STANDARD
☐72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian