Construction Report
Zero-Valent Iron
Groundwater Treatment Wall
Market Street Property
Seattle, Washington

HARTCROWSER
Delivering smarter solutions

Prepared for
A&B Jacobson, LLC

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J-4063-10

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CONSTRUCTION REPORT
ZERO-VALENT IRON GROUNDWATER TREATMENT WALL
MARKET STREET PROPERTY
SEATTLE, WASHINGTON

This report presents a summary of construction activities for the zero-valent iron funnel and gate groundwater treatment system installed at 2801 Market Street in the Ballard district of Seattle, Washington. The system was generally built to design criteria specified in the Construction and Soil Management Plan (CSMP) (Hart Crowser, 1999). Construction details, including changes to the initial design, are provided below.

CONSTRUCTION DOCUMENTATION

Daily field reports by Hart Crowser and Geo-Solutions are provided in Appendix A. A timeline is presented in Table 1. As-built details of the wall are provided below and in Drawing C-2, which has been updated from the design set. Photographs of construction are provided in Appendix B.

Construction of the Cement-Bentonite Groundwater Cut-off Wall

The cement-bentonite wall was built as shown on the design drawings with the following modifications:

- The depth of the wall was field-adjusted based on the observed depth to the hard silt layer, which acts as a base layer key for the wall. As-built depths of the key and the wall are shown on Drawing C-2. In general, the wall was 1 to 3 feet deeper from Station 0+90 to Station 1+90, and from Station 2+35 to 3+27, and 1 to 4 feet shallower from Station 0+00 to Station 0+40. The depth of the wall meets the key criterion of 2-foot embedment.

- The width of the wall was typically 3 feet due to the width of the backhoe bucket. Wall panels are generally wider at depths less than 10 feet as a result of side wall sloughing. In particular, between Stations 1+00 and 1+20, the upper 10 feet of wall is approximately 10 feet thick.

- The cement-bentonite panel was completed only to Station 0+40 rather than Station 0+45 as designed due to an equipment breakdown. To compensate, Treatment Gate 1 began at Station 0+40 instead of Station 0+45.

- The intersection of the wall panel south of the railroad tracks and east of Treatment Gate 2 with the wall panel crossing the railroad tracks is at Station 2+63 rather than Station 2+69, as originally designed.

Construction of Iron/Sand Gates

The iron/sand gates were built as shown on the design drawings with the following modifications:

- The depth of the gates were field-adjusted based on the observed depth to the hard silt key. As-built depths of the key and the gates are shown on Drawing C-2. Treatment Gate 1 from 0+40 to 0+90 was constructed 0 to 2 feet shallower, and Treatment Gate 2 from 1+90 to 2+35 was constructed 1 to 3 feet deeper than designed.

- The nominal width of the gates, based on field observations, is 3 feet. The gate widths estimated from the measured gate dimensions and the calculated quantity of materials added, however, were less than designed. These values are based on rough literature estimates of sand and iron bulk density since the actual bulk density of the sand and iron mixture was not measured. The estimated widths of Treatment Gate 1 (2.2 feet) and Treatment Gate 2 (2.8 feet) may result from squeezing of the excavated trench, particularly Treatment Gate 1, which was open when several loaded railcars passed by. We used these widths as a conservative estimate for calculating the as-built safety factors.

- Treatment Gate 1 was extended to Station 0+40 for a total length of 50 feet.

- In both gates, the iron/sand mixture added contained 43% iron (by volume). Due to an oversight by the contractor, the sand and iron were mixed in the field to 50% iron on a weight basis instead of a volume basis. Even with the lower percentage of iron, the wall still has a significant safety factor.

The impact of the design changes on the calculated safety factor is presented in Table 2. The calculated as-built safety factors are 4.2 for Treatment Gate 1 and 7.6 for Treatment Gate 2, based on the treatability test results and assuming no natural attenuation downgradient of the wall.

Regrading

North of Railroad Tracks. Soil from the excavation designated as suitable for on-site fill was placed north of the railroad tracks and mixed with 169 tons of lime to reduce the moisture content. A woven geotextile fabric was placed above the

fill, and approximately 3 to 6 inches of crushed rock were spread over the fill, and berms were constructed along the northern and eastern sides of the fill area to prevent storm water runoff into the building or into the street. The fill area was extended 100 feet to the west and raised to the top of the concrete wall along the northern edge to account for the additional volume of soil. Nuclear density and moisture content test results for the fill are provided in Table 3.

South of Railroad Tracks. Fabric was placed above the soil-bentonite caps above the gates. Approximately 82 cubic yards of structural fill were placed above the fabric and in the footprint of the former asphalt pavement, graded to slope away from the railroad tracks, and compacted with a vibratory roller. Nuclear density and moisture content test results are provided in Table 3. Asphalt was laid in the footprint of the previous asphalt surface to match the existing asphalt.

Railroad Tracks. Backfill beneath the railroad tracks, compaction, and replacement of the railroad tracks was performed by the Railroad Owner and was not the responsibility of the Contractor.

Utility Protection

Water Line. The water line located at the wall crossing of the railroad tracks was protected with a 2-foot-diameter concrete collar prior to excavation. An unmarked water stub was broken during preparatory work and repaired by the City of Seattle.

Storm Drains. A 18-inch VCP storm drain, crossing the cement-bentonite wall at Station 1+06, was abandoned and capped on both sides of the wall. The abandoned stubs extend approximately 2 feet into the wall with 6 feet of cement-bentonite between the capped ends. The cement-bentonite wall between Station 0+95 and Station 1+15 was constructed 10 feet thick down to two feet below the storm drain.

Two storm drains in the fill area north of the railroad tracks were uncovered after fill was completed. The eastern storm drain was completed to the new surface grade with a concrete collar. A drainage basin was dug around the western drain (located near recovery well RW-8).

Sanitary Sewer. A unmarked 10-inch-diameter sanitary sewer line was encountered at a depth of 12 feet at approximate Station 1+20. Excavation proceeded around the line and no leakage into the sewer was observed. The line was encased in the cement-bentonite wall.

Monitoring Wells

South of Railroad Tracks. During excavation of the wall, monitoring well JT-1 was removed. In addition, monitoring wells JT-2, ECI-SW, and ECI-SE were destroyed during excavation activities.

North of Railroad Tracks. The following monitoring or recovery wells were destroyed and removed from service in the fill area: MW-9S, MW-9D, MW-4S, MW-4I, MW-21S, MW-21I, MW-5S, MW-5I, RW-6, RW-7, and RW-8. A separate plan calls for replacement of key monitoring wells in the fill area and at other locations around the wall for future monitoring needs.

SOIL TESTING DATA

Excavated soil was tested for geotechnical and chemical suitability as backfill. Backfilled soil was tested for compaction and moisture content. Geotechnical testing data are presented in Table 3. Analytical chemical data are presented in Table 4. Laboratory certificates of analysis for geotechnical and chemical testing are provided in Appendix C. Results are summarized below.

Geotechnical Testing

Proctor results for soil excavated above the water table indicated that this soil was suitable for backfill. Proctor results for soil excavated below the water table indicated that the moisture content was too high for suitable compaction. Lime was selected as an additive to reduce the moisture content. Based on further tests and vendor recommendation, a minimum of 2% by weight lime was estimated to be necessary to adequately reduce the soil moisture content. Field tests performed after lime addition indicated that the moisture content was sufficiently reduced and the material adequately compacted.

Chemical Testing

Stockpiles of excavated soil were segregated and sampled in accordance with the CSMP. One sample from each stockpile, composited from the volatile organic compound samples, was analyzed for the metals listed in the CSMP. The chemical constituents detected in soil samples were detected at concentrations below the direct contact criteria specified in the CSMP.

DISPOSAL OF EXCAVATED SOIL

An estimated 1,300 cubic yards of soil were removed during excavation of the funnel and gate wall. Approximately 250 cubic yards were disposed of off-site through Rabanco (see Appendix D). Approximately 50 cubic yards were used in the soil-bentonite caps above the iron/sand gates. An estimated 150 cubic yards of soil that were taken from above the water table and determined to be chemically and geotechnically suitable were used as backfill above the gates and cement-bentonite wall. The remainder of excavated material was placed in the fill area north of the railroad tracks and mixed with 169 tons of lime to lower its moisture content. The source and destination of soil in each stockpile are presented in Table 5.

LIMITATIONS

Work for this project was performed, and this letter report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of A&B Jacobson, LLC, for specific application to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.

Any questions regarding our work and this letter report, the presentation of the information, and the interpretation of the data are welcome and should be referred to the undersigned.

We trust that this report meets your needs.

Sincerely,

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Table 1 - Construction Timeline

Activity	Date Started	Date Completed
Excavation and Construction of Cement-Bentonite Wall	October 6, 1999	October 21, 1999
Excavation and Construction of Treatment Gate 1	October 18, 1999	October 19, 1999
Excavation and Construction of Treatment Gate 2	October 23, 1999	October 25, 1999
Mixing and Stabilization of Fill	November 1, 1999	November 3, 1999
Regrading and Surface Finishing	November 1, 1999	November 5, 1999
Well and Storm Drain Restoration and Site Cleanup	November 5, 1999	November 12, 1999

406310\ZeroValent(tbls).xls - Timeline

Table 2 - Calculation of the Safety Factor for the Iron Wall

Constituent Concentrations for Wall Design in µg/L

Constituent	Influent Gate 1	Influent Gate 2	Effluent No NA	Effluent w/NA
PCE	50,000	8,000	4.15	41.5
TCE	23,000	1,000	55.6	556
cis-DCE	8,000	6,000	80	800
VC	200	800	2.92	29.2

NA = Natural Attenuation downstream of the wall.

Gate Dimensions and Groundwater Flow Calculations

Parameter	Value	Unit
Gate 1 Length	50	ft
Gate 2 Length	45	ft
Cutoff Wall Length	232	ft
Funnel and Gate Ratio	2.4	
Gate Flow Velocity used for Design	0.5	ft/day
Estimated Groundwater Flow Velocity from Modeling	0.14	ft/day
Hydrologic Safety Factor	3.6	

Safety Factor Calculations

Parameter	Gate 1 No NA	Gate 1 w/NA	Gate 2 No NA	Gate 2 w/NA
Required Residence Time in Days [1]	1.6	1.2	1.3	0.9
Required Flow through Thickness for 100% Iron in Feet	0.8	0.6	0.7	0.5
Gate Thickness for 50% Iron Mixture in Feet	1.6	1.2	1.3	0.9
Gate Thickness for 43% Iron Mixture in Feet	1.9	1.4	1.5	1.1
Actual Gate Thickness in Feet	2.2	2.2	2.8	2.8
Safety Factor (not including hydrologic safety factor)	1.2	1.8	2.1	3.0
Total Safety Factor	4.2	6.5	7.6	10.7

Notes:

[1] Based on treatability test results.

Table 3 - Summary of Soil Geotechnical Testing Data

Laboratory Testing

Sample Location	Sample Moisture Content in Percent	Optimal Moisture Content in Percent	Maximum Dry Density in pcf
Stockpile PC-1	37	12.4	119.9
Stockpile PNCS-1	6	7.5	137.3
Fill Material - 2% Lime	12	10.5	123.4

Field Testing

Sample Location	Measured Dry Density in pcf	Compaction in Percent of Maximum Dry Density [1]	Moisture Content in Percent
Station 1+77	126.1	94.9	4.2
Station 1+40	127	96.6	3.6
Station 0+20	127.7	97.2	3.1
Station 3+20	125.8	95.7	5.9
North of Railroad Tracks 80 Feet East of Station 3+20 [2]	116.3	88.5	15
North of Railroad Tracks 150 Feet East of Station 3+20	125.9	95.8	5.1
North of Railroad Tracks 270 Feet East of Station 3+20	118.1	89.9	6.7

Notes:

[1] Based on an assumed maximum dry density of 131.4 pcf, based on engineering practice.

[2] Sample taken in an area that was disturbed while recovering a monitoring well.

Table 4 - Summary of Chemical Results for Excavated Soil

Stockpile Name		PC-1				PC-2					
Sample Number	*Detection*	S-1	S-2	S-3	S-3 (DUP)	S-1	S-2	S-3	S-4	S-5	S-5 (DUP)
Date of Sampling	*Limit*	11/09/99	11/09/99	11/09/99	11/09/99	10/11/99	10/11/99	10/11/99	10/11/99	10/11/99	10/11/99
Volatile Organic Compounds in mg/kg (Detected Compounds Only)											
Benzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	0.08	ND
Ethylbenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND	0.06	ND	0.05	0.05
Trans-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.05	ND	ND	ND	ND	ND	0.12	0.16	ND	ND	ND
Tetrachloroethene	0.05	ND	ND	ND	ND	0.57	0.83	ND	0.5	0.48	0.44
Total Metals in mg/kg		*PC-1 Composite*				*PC-2 Composite*					
Arsenic	10	ND				ND					
Cadmium	1	ND				ND					
Chromium	20	24				ND					
Copper	5	20				14					
Lead	5	8				35					
Nickel	5	23				22					
Zinc	20	37				53					

Notes:
ND = Not detected at detection limit indicated.
DUP = Duplicate

Table 4 - Summary of Chemical Results for Excavated Soil

Stockpile Name		PC-3			PC-4				PC-5		
Sample Number	*Detection*	S-1	S-2	S-3	S-1	S-1 (DUP)	S-2	S-3	S-1	S-2	S-3
Date of Sampling	*Limit*	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99
Volatile Organic Compounds in mg/kg (Detected Compounds Only)											
Benzene	0.05	ND	ND	ND	0.14	0.1	ND	0.17	ND	0.15	ND
Toluene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.58
Ethylbenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	20
Total Xylenes	0.05	ND	ND	ND	0.58	0.58	1.6	0.19	2.6	0.39	92
Cis-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.05	ND	ND	ND	ND	ND	ND	0.53	ND	ND	ND
Tetrachloroethene	0.05	0.21	ND	ND	ND	ND	0.96	1.7	ND	ND	ND
Total Metals in mg/kg		*PC-3 Composite*			*PC-4 Composite*		*PC-4 Composite (DUP)*				
Arsenic	10	ND			ND		ND				
Cadmium	1	ND			ND		ND				
Chromium	20	26			ND		ND				
Copper	5	10			9		9				
Lead	5	ND			ND		ND				
Nickel	5	13			29		26				
Zinc	20	ND			ND		ND				

Notes:
ND = Not detected at detection limit indicated.
DUP = Duplicate

Table 4 - Summary of Chemical Results for Excavated Soil

Stockpile Name		PC-6				PC-7				
Sample Number	*Detection*	S-1	S-2	S-3	S-3 (DUP)	S-1	S-2	S-3	S-4	S-5
Date of Sampling	*Limit*	10/14/99	10/14/99	10/14/99	10/14/99	10/14/99	10/14/99	10/14/99	10/15/99	10/15/99
Volatile Organic Compounds in mg/kg (Detected Compounds Only)										
Benzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	0.05	0.16	0.07	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	0.05	ND	0.12	ND	ND	0.14	ND	0.16	ND	0.4
Cis-1,2-Dichloroethene	0.05	1.6	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.05	ND	ND	ND	ND	ND	0.37	ND	ND	ND
Tetrachloroethene	0.05	ND	0.09	0.23	0.32	0.22	3.9	0.13	0.05	0.07
Total Metals in mg/kg		*PC-6 Composite*		*PC-6 Composite (DUP)*				*PC-7 Composite*		
Arsenic	10	ND		ND				ND		
Cadmium	1	ND		ND				ND		
Chromium	20	ND		ND				ND		
Copper	5	ND		ND				ND		
Lead	5	ND		ND				ND		
Nickel	5	ND		ND				ND		
Zinc	20	ND		ND				26		

Notes:
ND = Not detected at detection limit indicated.
DUP = Duplicate

Table 4 - Summary of Chemical Results for Excavated Soil

Stockpile Name		PC-8					
Sample Number	*Detection*	S-1	S-2	S-2 (DUP)	S-3	S-4	S-5
Date of Sampling	*Limit*	10/18/99	10/18/99	10/18/99	10/18/99	10/19/99	10/19/99
Volatile Organic Compounds in mg/kg (Detected Compounds Only)							
Benzene	0.05	ND	ND	ND	ND	ND	ND
Toluene	0.05	ND	ND	ND	ND	1.6	0.37
Ethylbenzene	0.05	ND	ND	ND	ND	ND	ND
Total Xylenes	0.05	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	0.05	ND	ND	ND	ND	0.49	ND
Trans-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND
Trichloroethene	0.05	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.05	ND	ND	ND	ND	ND	ND
Total Metals in mg/kg		*PC-8 Composite*					
Arsenic	10	ND					
Cadmium	1	ND					
Chromium	20	26					
Copper	5	34					
Lead	5	ND					
Nickel	5	33					
Zinc	20	69					

Notes:
ND = Not detected at detection limit indicated.
DUP = Duplicate

Table 4 - Summary of Chemical Results for Excavated Soil

Stockpile Name		PC-9					PC-10				
Sample Number	*Detection*	S-1	S-2	S-3	S-4	S-4 (DUP)	S-1	S-2	S-3	S-4	S-5
Date of Sampling	*Limit*	10/21/99	10/21/99	10/21/99	10/21/99	10/21/99	10/21/99	10/20/99	10/21/99	10/22/99	10/22/99
Volatile Organic Compounds in mg/kg (Detected Compounds Only)											
Benzene	0.05	ND	0.41	0.23	0.8	1.01	ND	ND	0.16	0.07	0.47
Toluene	0.05	0.09	1.2	0.62	1.9	1.6	ND	ND	0.11	ND	ND
Ethylbenzene	0.05	ND	4.9	0.14	0.45	0.35	ND	ND	0.19	ND	ND
Total Xylenes	0.05	0.22	29	1.4	3.3	2.7	1.3	1.2	1.2	ND	0.77
Cis-1,2-Dichloroethene	0.05	ND	0.05	ND	0.08	0.05	ND	0.1	0.12	ND	0.11
Trans-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.05	ND	ND	ND	ND	ND	0.05	1.1	ND	ND	0.15
Tetrachloroethene	0.05	ND	ND	ND	ND	ND	0.44	0.83	0.49	0.27	1.3
Total Metals in mg/kg				*PC-9 Composite*					*PC-10 Composite*		
Arsenic	10			ND					ND		
Cadmium	1			ND					ND		
Chromium	20			ND					ND		
Copper	5			16					11		
Lead	5			11					ND		
Nickel	5			ND					ND		
Zinc	20			102			83				

Notes:
ND = Not detected at detection limit indicated.
DUP = Duplicate

Table 4 - Summary of Chemical Results for Excavated Soil

Stockpile Name		PC-11				PC-12				
Sample Number	*Detection*	S-1	S-2	S-3	S-3 (DUP)	S-1	S-2	S-3	S-4	S-5
Date of Sampling	*Limit*	10/25/99	10/25/99	10/25/99	10/25/99	10/25/99	10/25/99	10/25/99	10/25/99	10/25/99
Volatile Organic Compounds in mg/kg (Detected Compounds Only)										
Benzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	0.05	ND	ND	ND	0.1	0.1	ND	0.14	ND	ND
Ethylbenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	0.05	0.14	0.1	0.24	0.28	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	0.05	0.18	0.11	0.15	ND	ND	0.67	0.07	0.06	0.4
Trans-1,2-Dichloroethene	0.05	0.21	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.05	0.34	0.21	0.22	0.32	0.32	1.5	0.21	0.19	1.4
Tetrachloroethene	0.05	1.3	1.1	1.2	1.7	1.7	2.3	1.5	2.8	7
Total Metals in mg/kg		*PC-11 Composite*				*PC-12 Composite*		*PC-12 Composite (DUP)*		
Arsenic	10	ND				ND		ND		
Cadmium	1	ND				ND		ND		
Chromium	20	ND				22		28		
Copper	5	28				84		104		
Lead	5	ND				7.7		8.8		
Nickel	5	ND				28		30		
Zinc	20	79				72		74		

Notes:
ND = Not detected at detection limit indicated.
DUP = Duplicate

Table 4 - Summary of Chemical Results for Excavated Soil

Stockpile Name		PNCS-1 (Originally SP-1)						PNCS-2		
Sample Number	*Detection*	S-1	S-2	S-3	S-4	S-5	S-6	S-1	S-2	S-3
Date of Sampling	*Limit*	10/07/99	10/07/99	10/07/99	10/08/99	10/08/99	10/08/99	10/09/99	10/09/99	10/09/99
Volatile Organic Compounds in mg/kg (Detected Compounds Only)										
Benzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.05	ND	ND	ND	ND	ND	0.11	ND	ND	ND
Tetrachloroethene	0.05	ND	1.8	ND	ND	0.86	ND	ND	ND	ND
Total Metals in mg/kg		*PNCS-1 Composite (S-1, S-2, S-3)*						*PNCS-2 Composite*		
Arsenic	10		ND						ND	
Cadmium	1		ND						ND	
Chromium	20		ND						26	
Copper	5		15						40	
Lead	5		ND						60	
Nickel	5		36						36	
Zinc	20		21						36	

Notes:
ND = Not detected at detection limit indicated.
DUP = Duplicate

Table 4 - Summary of Chemical Results for Excavated Soil

Stockpile Name		PNCS-3						
Sample Number	*Detection*	SS-1	SS-2	PH-1 S-1	PH-1 S-2	PH-2 S-1	PH-2 S-1 (DUP)	PH-3 S-1
Date of Sampling	*Limit*	10/10/99	10/10/99	10/10/99	10/10/99	10/10/99	10/10/99	10/10/99
Volatile Organic Compounds in mg/kg (Detected Compounds Only)								
Benzene	0.05	ND	ND	ND	ND	ND	ND	ND
Toluene	0.05	0.13	ND	ND	ND	ND	ND	ND
Ethylbenzene	0.05	1.4	ND	ND	ND	ND	ND	ND
Total Xylenes	0.05	11	ND	0.72	0.41	ND	ND	ND
Cis-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.05	ND	ND	ND	ND	0.15	0.23	ND
Tetrachloroethene	0.05	ND	ND	ND	ND	1.6	2.2	ND
Total Metals in mg/kg								
Arsenic	10							
Cadmium	1							
Chromium	20							
Copper	5							
Lead	5							
Nickel	5							
Zinc	20							

Notes:
ND = Not detected at detection limit indicated.
DUP = Duplicate

Table 5 - Volumes of Excavated Soil and Fill Materials

Excavated Soil

Wall Section	Stockpile Number	Estimated Volume of Excavated Soil in Cubic Yards [1, 2]	Disposal Location
Station 3+00 to 3+12 below water table	PC-1	25	Fill Area North of Railroad Tracks
Station 2+67 to 3+27	PC-2	160	Fill Area North of Railroad Tracks
Station 2+35 to 2+67	PC-3	100	Fill Area North of Railroad Tracks
Station 1+57 to 1+94	PC-4	100	Fill Area North of Railroad Tracks
Station 1+37 to 1+57	PC-5	50	Fill Area North of Railroad Tracks
Station 0+90 to 1+16	PC-6	110	Fill Area North of Railroad Tracks
Station 0+20 to 0+45	PC-7	130	Fill Area North of Railroad Tracks
Station 1+90 to 2+35	PC-8	120	Off-site Disposal by Rabanco
Station 1+16 to 1+37	PC-9	60	Off-site Disposal by Rabanco
Station 0+65 to 0+90 above 20-foot depth	PC-10	70	Off-site Disposal by Rabanco
Station 0+65 to 0+90 below 20-foot depth	PC-11	30	Fill Area North of Railroad Tracks
Station 0+40 to 0+65	PC-12	90	Fill Area North of Railroad Tracks
Station 0+00 to 0+20	PNCS-1	60	Fill Area North of Railroad Tracks
Station 3+00 to 3+12 above watertable	PNCS-2	25	Fill Area North of Railroad Tracks
Station 0+00 to 1+90 above 4-foot depth	PNCS-3	200	Backfill above Gates and Wall

Fill Material

Location	Material	Mass of Material Used in Tons	Estimated Volume of Fill in Cubic Yards
Impermeable Wall	Cement	108	*Cement-Bentonite Slurry:*
Impermeable Wall	Bentonite	19	727
Reactive Gate	Iron	162	75
Reactive Gate	Sand	162	100
Reactive Gate	Biopolymer	1.2	NA
Soil-Bentonite Cap	Bentonite	8	*Soil-Bentonite Slurry:*
Soil-Bentonite Cap	Soil (PNCS-3)	50	60
Above Gate and Wall	Soil (PNCS-3)	NM	150
Above Gate and Wall	Structural Fill [3]	123	82
Fill Area North of Railroad Tracks	Excavated Soil	NM	850
Fill Area North of Railroad Tracks	Structural Fill	77	51
Fill Area North of Railroad Tracks	Lime	169	296

Location	Material Use	Estimated Total Volume in Cubic Yards
North of Railroad Tracks	Fill	1,200
Wall	Excavation	1,300
Wall	Fill	1,200
Off-site	Disposal	250

Notes:
NM = Not measured.

[1] Volume based on visual estimate of stockpile size.

[2] Volume of soil sent to Rabanco based on an assumed density of 2 tons per cubic yard.

[3] Structural fill beneath railroad was supplied by railroad owner and is not included.

406310\ZeroValent(tbls).xls - Soil Volume

APPENDIX A
DAILY FIELD REPORTS
GEO-SOLUTIONS, INC. AND
HART CROWSER, INC.

Geo-Solutions

CB Slurry Wall

PROJECT NAME Funnel and Gate
PROJECT NAME A & B Terminals
PROJECT LOCATION Ballard, WA

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Wed: 10/6/1999 SHIFT NO. 1 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES:			CEM. DELIVERIES:		
	1	TRUCKS TODAY		2	TRUCKS TODAY
	2	TRUCKS TODATE		3	TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2 ft wide)

Sta.	Depth*	Key**	Comments	Sta.	Depth	Key	Comments
Panel 1							
0+00	26	5	hard key				
0+10	26	5					
0+20	28	1.5	hoe broken down @ 4:30				
	* Depths measured from original ground (O.G.) surface, or interpolated O.G. to bottom of trench						
	** Key is depth of penetration into till layer at bottom of trench						
			SF TODAY =	530		SF TODATE	530

Bentonite Slurry / Cement Bentonite Slurry

Time	Visc	Density	Comment	Time	Batch	Density	Comment
	(MF sec)	(pcf)			(#)	(pcf)	
3:30	37	64	10/5/99 - test batch	9:30	3	68	thick gel, mixer contam
9:00	34	64	10/6 - refined batch		2	70	make thicker
9:00	35	64		12:10	4	68	8 bags, dens @ mixer
				1:35	5	70	9 bags, dens @ trench
Design Mix:				2:15	2		start 2nd panel
		per	535 gals water	3:00	7	72	@ trench
	B/W	0.035-0.045	1.5 to 2 bags	4:25	1	70	start cleanup
	C/W	0.17-0.19	8 to 9 bags				
	Density	70-72	at end of hose	Trench to be filled to within 3 ft of O.G.			
			2.85 cy/batch		24	68.4 cy	

COMMENTS:

Normal first day. Typical chemical reaction creates thickening of slurry in mixer. Seak to improve mixing.

Backhoe has difficulty penetrating key layer. Seek to improve excavation.

Poured concrete encasement around waterline

Equipment on Site:	-Cat 426 tractor-backhoe
-GSI mixer w/ 2-600 gal pits	-Kobelco SK200 extenda-hoe (broken down)
-GSI generator (stby - too noisy and smokey), 100 KW	-Dump truck - 3 axial
-Rental generator, 125 KW	-Lull 544 forklift
-JD 544 wheel loader	-20 kgal frac tank

SIGNED: _____ SIGNED: _____
Contractor's QC Supervisor Owner's Representative

Geo-Solutions

CB Slurry Wall

PROJECT NAME Funnel and Gate
PROJECT NAME A & B Terminals
PROJECT LOCATION Ballard, WA

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Thurs: 10/7/1999 SHIFT NO. 2 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES: 0 TRUCKS TODAY 2 TRUCKS TODATE

CEM. DELIVERIES: 1 TRUCKS TODAY 4 TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2 ft wide)

Sta.	Depth	Key	Comments	Sta.	Depth	Key	Comments
			NONE - HOE BROKEN				
			SF TODAY =	0		SF TODATE	530

Bentonite Slurry Cement Bentonite Slurry

Time	Visc (MF sec)	Density (pcf)	Comment	Time	Batch (#)	Density (pcf)	Comment
			NONE				

COMMENTS:

No work today - trackhoe broken
Received 500# soda ash

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

CB Slurry Wall

PROJECT NAME Funnel and Gate
PROJECT NAME A & B Terminals
PROJECT LOCATION Ballard, WA

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Fri: 10/8/1999 SHIFT NO. 3 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES:			CEM. DELIVERIES:		
	0	TRUCKS TODAY		0	TRUCKS TODAY
	2	TRUCKS TODATE		4	TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2.5 ft wide)

Sta.	Depth	Key	Comments	Sta.	Depth	Key	Comments
Panel 2							
2+63-12	22	0	Extended for overlap				
2+63	25	3+	corner w/ E-W barrier				
2+77	26	3+	RR tracks				
2+87	24	3+	waterline				
			Ended under waterline, must connect from opposite direction due to building				
			SF TODAY =	607		SF TODATE	1137

Bentonite Slurry

Time	Visc	Density	Comment
	(MF sec)	(pcf)	
11:30	37	64	
2:30		64	
6:00		64	

Cement Bentonite Slurry

Time	Batch	Density	Comment
	(#)	(pcf)	
11:30	1	72	to 0+10, install new jets
1:30	2		changed jets, too small
4:00	12	70	added air mixer
6:00	19	70	started cleanup
	34	96.9	

COMMENTS:

RR tracks removed, hoe, JD 892 ELC, arrived at 11:30, using lined containment for spoil staging
Unk vol slurry leaks onto adjoing A&B property - cleaned up with firehose, etc
Dug from corner to just past waterline.
Worked until 8:00 pm
JD hoe has 30 " wide bucket

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

CB Slurry Wall

PROJECT NAME Funnel and Gate
PROJECT NAME A & B Terminals
PROJECT LOCATION Ballard, WA

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Sat: 10/9/1999 SHIFT NO. 4 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES:			CEM. DELIVERIES:		
	0	TRUCKS TODAY		0	TRUCKS TODAY
	2	TRUCKS TODATE		4	TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2.5 ft wide)

Sta.	Depth	Key	Comments	Sta.	Depth	Key	Comments
1+90			started exc, but had to quit when CB pump plugged				
			SF TODAY =	0		SF TODATE	1137

Bentonite Slurry

Time	Visc (MF sec)	Density (pcf)	Comment
8:00		64	

Cement Bentonite Slurry

Time	Batch (#)	Density (pcf)	Comment
9:30	9	70	pump plugged
	9	25.65	

COMMENTS:

Production halted when CB pumped failed due to clough. Spent balance of day on maintainence, etc
Pump fixed by 2:00

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

CB Slurry Wall

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Sun: 10/10/1999 SHIFT NO. 5 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES:	0	TRUCKS TODAY	CEM. DELIVERIES:	0	TRUCKS TODAY
	2	TRUCKS TODATE		4	TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2.5 ft wide)

Sta.	Depth	Key	Comments	Sta.	Depth	Key	Comments
Panel 3							
3+27	19	3+	start next to bldg, found unknown VCP sewer				
3+17	20	3+					
3+12	20	3+	found unknown conduit, backhoe broke hyd hose, down rest of day				
			SF TODAY =	295		SF TODATE	1432

Bentonite Slurry Cement Bentonite Slurry

Time	Visc (MF sec)	Density (pcf)	Comment	Time	Batch (#)	Density (pcf)	Comment
8:00		64		9:30	9	70	stop when hoe broke
					9	25.65	

COMMENTS:

JD hoe broke hyd line on bucket cyl at 9:30. Nearly at tie in under watermain

*filled part of trench w/ bento slurry to cleanout mixer - check set and replace as necessary when excavation continues

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

CB Slurry Wall

PROJECT NAME Funnel and Gate
PROJECT NAME A & B Terminals
PROJECT LOCATION Ballard, WA

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Mon: 10/11/1999 SHIFT NO. 6 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES:			CEM. DELIVERIES:		
	0	TRUCKS TODAY		0	TRUCKS TODAY
	2	TRUCKS TODATE		4	TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2.5 ft wide)

Sta.	Depth	Key	Comments	Sta.	Depth	Key	Comments
Panel 4							
3+12	20	3+	Continued from 10/10, CB ok				
2+87	24	3+	Tie-in under watermain	550 sf			
Panel 5							
2+63-12	25	3+	Extended for overlap	676 sf			
2+63	24	3+	Corner				
2+53	24	3+					
2+43	24	3+					
2+35	25	3+	Start Gate #2				
2+33	24	3+	Extended wall for future tie-in w/gate				
			SF TODAY =	1226		SF TODATE	2658
						% Complete	45%

Bentonite Slurry / Cement Bentonite Slurry

Time	Visc (MF sec)	Density (pcf)	Comment	Time	Batch (#)	Density (pcf)	Comment
10:00		64	start work after fixing	10:30	5		Top off 3+00
			JD hoe	11:50	7	71	Complete to 2+87
				1:45			Start at corner
				4:00	MFV=40	75	Dug out at 2+45
				4:45	18		Filled trench
				5:05			cleanup complete
				TODAY	30	85.5	

COMMENTS:

Completed tie-in under watermain - barrier complete across RR tracks to corner @ 2+63
Extended barrier from corner to Gate #2
Measured work completed: Slight variation in angle of funnel; plan length = 58 ft, actual length = 64 ft
corner moved from 2+68 to 2+63

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

CB Slurry Wall

PROJECT NAME Funnel and Gate
PROJECT NAME A & B Terminals
PROJECT LOCATION Ballard, WA

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Tue: 10/12/1999 SHIFT NO. 7 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES:			CEM. DELIVERIES:		
	0	TRUCKS TODAY		0	TRUCKS TODAY
	2	TRUCKS TODATE		4	TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2.5 ft wide)

Sta.	Depth	Key	Comments	Sta.	Depth	Key	Comments
Panel 6							
1+94	24	3+	Overlap for gate 1				
1+92	25	3+	Start				
1+82	24	3+					
1+72	24	3+					
1+62	24	3+					
1+52	24	3+	Truck broke at 1:20				
1+42	24	3+	Resume at 3:30				
1+37	26	3+	key becoming harder and with more visible gravel particles				
			SF TODAY =	1330		SF TODATE	3988
						% Complete	67%

Bentonite Slurry / Cement Bentonite Slurry

Time	Visc	Density	Comment	Time	Batch	Density	Comment
	(MF sec)	(pcf)			(#)	(pcf)	
9:30	33	64		8:00	2		Top off 2+50
3:45		64		8:30	5		Top off 3+00 as stepup
			using extra bentonite	9:00			Start 1+92
			at am and pm to clean	9:45		70	
			up and slick hose	11:40	17		1+72
				1:20	14		
				3:30		70	
				4:40	8		
				TODAY	46	131.1	

COMMENTS:

Exc starting at gate 2 toward gate 1.
Extra operator on site to move stockpiled soil to disposal area.
Exposed sewer @ 1+06 - not 24 " steel but 15" VCP - broke pipe, 12 ft deep to top from RR tracks.
At 55 ft long, trench beginning to show signs of cracking.

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

CB Slurry Wall

PROJECT NAME Funnel and Gate
PROJECT NAME A & B Terminals
PROJECT LOCATION Ballard, WA

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Wed: 10/13/1999 SHIFT NO. 8 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES:			CEM. DELIVERIES:		
	0	TRUCKS TODAY		0	TRUCKS TODAY
	2	TRUCKS TODATE		4	TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2.5 ft wide)

Sta.	Depth	Key	Comments	Sta.	Depth	Key	Comments
			No excavation today due to other work				
			SF TODAY =	0		SF TODATE	3988
						% Complete	67%

Bentonite Slurry Cement Bentonite Slurry

Time	Visc (MF sec)	Density (pcf)	Comment	Time	Batch (#)	Density (pcf)	Comment
				12:00	3		Top off 1+70
				TODAY	3	8.55	

COMMENTS:

Restored RR crossing.
Removed soil stockpiles to disposal area
At recommendation of WA State Dept of Ecology capped storm sewer to prevent short-curcuit of groundwater throught funnel and around gates
CB Slurry Wall todate

Panel	Sta to Sta	SF	OB = CB vol pumped/theoretical trench vol
1	0+00 to 0+20	530	2.05
2	2+63 to 2+87	607	2.13
3	3+12 to 3+27	295	1.11
4	2+87 to 3+12	550	1.10
5	2+33 to 2+63	676	1.05

SIGNED: _____ SIGNED: _____
Contractor's QC Supervisor Owner's Representative

Geo-Solutions

CB Slurry Wall

PROJECT NAME Funnel and Gate
PROJECT NAME A & B Terminals
PROJECT LOCATION Ballard, WA

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Thurs: 10/14/1999 SHIFT NO. 9 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES:			CEM. DELIVERIES:		
	0	TRUCKS TODAY		1	TRUCKS TODAY
	2	TRUCKS TODATE		5	TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2.5 ft wide)

Sta.	Depth	Key	Comments	Sta.	Depth	Key	Comments
Panel 7							
0+90	28	3+	JD hoe is 30" wide				
0+95	26	3+	"hole" from sewer is 20Lx10Wx15D				
1+06	26	3+	pipe plugged both ends				
1+14	23	3+	finished at 12:45	617 sf			
Panel 8							
0+20		0	no tie-in	0+38	34	4	Komatsu is 34-36 "wide
0+25	25	0	not to depth	0+40	33	3	
0+28	29	3+		0+43	30	0	
0+32	30	3+		0+47	30	0	458 sf
			SF TODAY =	1075		SF TODATE	5063
						% Complete	85%

Bentonite Slurry Cement Bentonite Slurry

Time	Visc	Density	Comment	Time	Batch	Density	Comment
	(MF sec)	(pcf)			(#)	(pcf)	
9:00		64		7:45	1		start the "hole"
2:45	33	64.5		9:35		84	in trench, from bailer
				9:45		70	plant
				12:45	30		train passes, end "hole"
				2:45	MF=50	71.5	
				4:40	22		
				6:35	9		hoe stick breaks
				1+06	31		
				1+38	31		
				TODAY	62	176.7	

COMMENTS:

Completed "hole" by 12:45. Dug from both ends to extend CB to gate and to 1+14
Attempted panel from gate to 0+20. Komastu backhoe broke stick nearly in two at 6:30. Center of panel is ok but ends are questionable. Connection at 0+20 to be made tomorrow. Connection at 0+45 to 0+40 still required

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

CB Slurry Wall

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Fri: 10/15/1999 SHIFT NO. 10 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES:			CEM. DELIVERIES:		
	0	TRUCKS TODAY		0	TRUCKS TODAY
	2	TRUCKS TODATE		5	TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2.5 ft wide)

Sta.	Depth	Key	Comments	Sta.	Depth	Key	Comments
Panel 9							
0+25	30	3+					
0+20	29	2					
			SF TODAY =	147.5		SF TODATE	5211
						% Complete	88%

Bentonite Slurry Cement Bentonite Slurry

Time	Visc	Density	Comment	Time	Batch	Density	Comment
	(MF sec)	(pcf)			(#)	(pcf)	
9:00		64		8:00	1		top off 1+06
				8:30	lost 0.5 due to pump plugged		
				9:10		71	
				9:30	5		complete 1+06
				10:00			redig 0+25 to 0+20
				12+40	11		complete 0+20 tie-in
				TODAY	17	48.45	

COMMENTS:

Worked 0.5 shift to complete tie-in and top off hole. All personnel off site by 2:00
Will move end of Gate 1 to 0+40 to adj to CB panel completed instead of 0+45.

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

BP DRAIN

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

Bio-Polymer Slurry Trench w/ Iron/Sand Backfill

DAILY QC RESULTS TECHNICAL SPECIFICATION: ETI Memo Aug 12, 1999

DATE: Mon, Oct 18, 1999 SHIFT NO. 1 INSPECTOR: Steven R. Day
Geo-Solutions

Guar Deliveries	0	TRUCKS TODAY
	1	TRUCKS TODATE

EXCAVATION: (measure every 10 lf, 3 ft wide) BACKFILL: (measure am and pm)

Sta.	Depth	Key	Comments	Sta.	Depth (am)	Depth (pm)	Comments
2+35	25	3+	dug 1/2 at 2:10	2+35		19	
2+25	25	3+		2+20		21	Set well
2+15	25	3+		2+10		23	
					Lost slope when received 100 F Fe/sand and		
					added too much water		

IRON/SAND (measure each load, fill to - 10 ft bgs)

Time	Truck No.	Sand (lbs)	Iron (4000lb bgs)	Guar Slurry (gal)	Water (gal)	Temp	Comments
2:40	1	12,000	3	285	100	60	
4:45	2	12,000	3	200	100+++	100,85	added water to cool
5:15	3	12,000	3	300-diluted	160+++	100,85	added water to cool

BIO-POLYMER SLURRY: (measure twice per shift)

Time	Batch	Location	Visc.	pH	Temp	Comments
8:50	trial	plant		5-6	56	water
10:30		plant	55	10		adding 500 gm soda
11:20		plant	70	9-9.5		
12:00		trench	58	8.5	59	
6:20		trench		10-10.5	60	adding 700 gm soda
7:30		trench	93	10	60	
	34					

COMMENTS: Fe/sand would not pump, dispite 2 hours of experimentation with mix
Used tremie with trac-hoe for placement. Fe/sand overheated due to overmixing in
concrete trucks. Used water to cool Fe/sand, added too much and lost backfill slope.
Worked until 8:00 pm

SIGNED: _____ SIGNED: _____
Contractor's QC Supervisor Owner's Representative

Geo-Solutions

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

BP DRAIN

Bio-Polymer Slurry Trench w/ Iron/Sand Backfill

DAILY QC RESULTS TECHNICAL SPECIFICATION: ETI Memo Aug 12, 1999

DATE: Tue, Oct 19, 1999 SHIFT NO. 2 INSPECTOR: Steven R. Day
Geo-Solutions

Guar Deliveries		
	0	TRUCKS TODAY
	1	TRUCKS TODATE

EXCAVATION: (measure every 10 lf, 3 ft wide) BACKFILL: (measure am and pm)

Sta.	Depth	Key	Comments	Sta.	Depth (pm-10/18)	Depth (pm-10/19)	Comments
2+15	25	3+		2+35	19	8.5	
2+05	25	3+		2+20	21	9	well
1+95	25	3+		2+15	23	9	
1+90	23.5	3+	dug out at 10:15	2+05	na	8	well
				1+95	na	9	
				1+90	na	8	
			SF = 1121				SF backfilled = 735

IRON/SAND (measure each load, fill to - 10 ft bgs)

Time	Truck No.	Sand (lbs)	Iron (4000lb bgs)	Guar Slurry (gal)	Water (gal)	Temp	Comments
8:15	4	12,000	3	0	250		
9:30	5	12,000	3	0	300		
10:15	6	12,000	3	0	300		
11:00	7	12,000	3	0	300		
11:15	8	12,000	3	0	300		
11:45	9	12,000	3	0	300		
12:15	10	12,000	3	0	300		
12:40	11	12,000	3	0	300		
2:00	12	12,000	3	0	300		

BIO-POLYMER SLURRY: (measure twice per shift)

Time	Batch	Location	Visc.	pH	Temp	Comments
7:30		trench	80	10.5	57	no loss in slurry level overnite
2:00		trench		10.5	60	
3:00	added 1 gal breaker to trench and wells, will pump tomorrow					
	added chlorine to excess slurry in top of trench from sta 1+80 to 0+20					
	6					

COMMENTS: Used truck mounted belt conveyor, with tremie attached to place Fe/sand
Denise from ETI on site
Moved spoil and worked spoil pile
Worked until 2:00

SIGNED: _____ SIGNED: _____
Contractor's QC Supervisor Owner's Representative

Geo-Solutions

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

BP DRAIN

Bio-Polymer Slurry Trench w/ Iron/Sand Backfill

DAILY QC RESULTS TECHNICAL SPECIFICATION: ETI Memo Aug 12, 1999

DATE: Wed, Oct 20, 1999 SHIFT NO. 2+ INSPECTOR: Steven R. Day
Geo-Solutions

Guar Deliveries		
	0	TRUCKS TODAY
	1	TRUCKS TODATE

EXCAVATION: (measure every 10 lf, 3 ft wide) BACKFILL: (measure am and pm)

Sta.	Depth	Key	Comments	Sta.	Depth (pm-10/18)	Depth (pm-10/19)	Comments
			NONE				

IRON/SAND (measure each load, fill to - 10 ft bgs)

Time	Truck No.	Sand (lbs)	Iron (4000lb bgs)	Guar Slurry (gal)	Water (gal)	Temp	Comments
			NONE				

BIO-POLYMER SLURRY: (measure twice per shift)

Time	Batch	Location	Visc.	pH	Temp	Comments
7:15	sta 1+80	trench	53	10.5	44	Chlorine treated, overflow trench
7:15	sta 2+10	trench	42	10.5	57	Enzyme treated, gate 2
4:00	started pumping trench, adding Citric acid to lower pH. After 100# acid, pH remains at 10.5					
7:00			low flow and fluid	10.5	58	pumping from well, very low flow
			appears broken			well screen too fine?

COMMENTS: Breaking slurry in trench
Discover that groundwater also has high pH plume. This complicates breaking slurry.

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

BP DRAIN

Bio-Polymer Slurry Trench w/ Iron/Sand Backfill

DAILY QC RESULTS TECHNICAL SPECIFICATION: ETI Memo Aug 12, 1999

DATE: Thurs, Oct 21, 1999 SHIFT NO. 3 INSPECTOR: Steven R. Day
Geo-Solutions

Guar Deliveries

0	TRUCKS TODAY
1	TRUCKS TODATE

EXCAVATION: (measure every 10 lf, 3 ft wide) BACKFILL: (measure am and pm)

Sta.	Depth	Key	Comments	Sta.	Depth (pm)	Depth (pm)	Comments
0+90			started exc				
0+80							

IRON/SAND (measure each load, fill to - 10 ft bgs)

Time	Truck No.	Sand (lbs)	Iron (4000lb bgs)	Guar Slurry (gal)	Water (gal)	Temp	Comments

BIO-POLYMER SLURRY: (measure twice per shift)

Time	Batch	Location	Visc.	pH	Temp	Comments
7:00	sta 2+10	gate 2	32	9	52	from slurry on top
				11.5		from bottom of well
4:00	sta 2+10	gate 2	31	8.5		added 1 gal 10% muratic acid
12:30	sta 0+90	trench	48	6	58	no additives used
1:30	sta 0+90	trench	50	9.5		1/2 additives due to high pH
4:30	sta 0+90	trench	>120	11		pH gain due to GW plume?
	14					

COMMENTS: Started exc for gate 1. Delayed completion of gate until more spoil removed and space made available for spoil and slurry.
Recirculated partially broken slurry from gate 2 from 3:00 to 6:00
Note: slurry is broken when MFV = 26-27 sec.(vis of water)

SIGNED: _____ SIGNED: _____
Contractor's QC Supervisor Owner's Representative

Geo-Solutions

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

BP DRAIN

Bio-Polymer Slurry Trench w/ Iron/Sand Backfill

DAILY QC RESULTS TECHNICAL SPECIFICATION: ETI Memo Aug 12, 1999

DATE: Fri, Oct 22, 1999 SHIFT NO. 4 INSPECTOR: Steven R. Day
Geo-Solutions

Guar Deliveries		
	0	TRUCKS TODAY
	1	TRUCKS TODATE

EXCAVATION: (measure every 10 lf, 3 ft wide) BACKFILL: (measure am and pm)

Sta.	Depth	Key	Comments	Sta.	Depth (pm-10/18)	Depth (pm-10/19)	Comments
0+90			trench open, no exc today				
0+80							

IRON/SAND (measure each load, fill to - 10 ft bgs)

Time	Truck No.	Sand (lbs)	Iron (4000lb bgs)	Guar Slurry (gal)	Water (gal)	Temp	Comments
			no backfill today				

BIO-POLYMER SLURRY: (measure twice per shift)

Time	Batch	Location	Visc.	pH	Temp	Comments
7:30		gate 2	31	8.5	56	from top
7:45		0+75	98	10.5	60	active trench on stby
11:00		gate 2	35	11		bottom of E well
3:15		gate 2	29	9	61	top of trench
4:30		gate 2	31	11		bottom of W well

COMMENTS: Loaded and hauled out spoil to landfill
Pumped into and out of wells at gate 2 to break slurry. Out @ 0.5-10 gpm, In @ >200 gpm
pumped gate 2 from 7:30 am to 7:30 pm
Added 2 cf biostarter, 2 gal muratic acid, 2 gal breaker

SIGNED: _____ SIGNED: _____
Contractor's QC Supervisor Owner's Representative

Geo-Solutions

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

BP DRAIN

Bio-Polymer Slurry Trench w/ Iron/Sand Backfill

DAILY QC RESULTS TECHNICAL SPECIFICATION: ETI Memo Aug 12, 1999

DATE: Sat, Oct 23, 1999 SHIFT NO. 5 INSPECTOR: Steven R. Day
Geo-Solutions

Guar Deliveries

0	TRUCKS TODAY
1	TRUCKS TODATE

EXCAVATION: (measure every 10 lf, 3 ft wide) BACKFILL: (measure am and pm)

Sta.	Depth	Key	Comments	Sta.	Depth (pm-10/18)	Depth (pm-10/19)	Comments
0+90	29	3+	Started exc @1:30				
0+80	29	3+	dug about 1/2 gate				
0+70							
0+60							

IRON/SAND (measure each load, fill to - 10 ft bgs)

Time	Truck No.	Sand (lbs)	Iron (4000lb bgs)	Guar Slurry (gal)	Water (gal)	Temp	Comments
			no backfill today				

BIO-POLYMER SLURRY: (measure twice per shift)

Time	Batch	Location	Visc.	pH	Temp	Comments
8:00		0+75	98	11	56	active trench
5:00		0+75	87	8.5		active trench on stby
8:15		gate 2	32	8.5	56	top, trench level down 14" total
8:30		gate 2	34	11	58	West well
12:30		gate 2	30	8	57	West well after acid
4:45		gate 2	28	11		West well, slurry nearly broken
4:45		gate 2	27	8		top, SLURRY BROKEN
	20					Trench down 17"

COMMENTS: Loaded and hauled out spoil to landfill
Pumped into and out of west well 12 hr. In > 200 gpm, Out 1-10 gpm
Added 2 gal 30% muraitic acid - created visable improvement in wells
Added 1/2 gal breaker

SIGNED: _____ SIGNED: _____
Contractor's QC Supervisor Owner's Representative

Geo-Solutions

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

BP DRAIN

Bio-Polymer Slurry Trench w/ Iron/Sand Backfill

DAILY QC RESULTS TECHNICAL SPECIFICATION: ETI Memo Aug 12, 1999

DATE: Sun, Oct 24, 1999 SHIFT NO. 5+ INSPECTOR: Steven R. Day
Geo-Solutions

Guar Deliveries | 0 | TRUCKS TODAY
| 1 | TRUCKS TODATE

EXCAVATION: (measure every 10 lf, 3 ft wide) BACKFILL: (measure am and pm)

Sta.	Depth	Key	Comments	Sta.	Depth (pm-10/18)	Depth (pm-10/19)	Comments
0+90			no exc today				

IRON/SAND (measure each load, fill to - 10 ft bgs)

Time	Truck No.	Sand (lbs)	Iron (4000lb bgs)	Guar Slurry (gal)	Water (gal)	Temp	Comments
			no backfill today				

BIO-POLYMER SLURRY: (measure twice per shift)

Time	Batch	Location	Visc.	pH	Temp	Comments
8:30		gate 2, top	27	8.5	53	SLURRY IS BROKEN
9:10		gate 2, W.well	27	10.5	64	SLURRY IS BROKEN
10:15		gate 2, E.well	26	9	60	SLURRY IS BROKEN
11:30		gate 2, E.well	26	9		SLURRY IS BROKEN
5:00		gate 2, E.well		10.5		Groundwater in trench
9:00		0+75	85	10.5		active trench on stdby

COMMENTS: Pumped E well from 9:30 to 7:30 @ 2 to 10 gpm
Total pumping time for gate 2 = 37 hrs @ 30% porosity & 6 gpm = 3+ pore volumes
TRENCH IS FLUSHED, BOTH WELLS OK

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

BP DRAIN

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

Bio-Polymer Slurry Trench w/ Iron/Sand Backfill

DAILY QC RESULTS

TECHNICAL SPECIFICATION: ETI Memo Aug 12, 1999

DATE: Mon, Oct 25, 1999 SHIFT NO. 6 INSPECTOR: Steven R. Day
Geo-Solutions

Guar Deliveries		
	0	TRUCKS TODAY
	1	TRUCKS TODATE

EXCAVATION: (measure every 10 lf, 3 ft wide) BACKFILL: (measure am and pm)

Sta.	Depth	Key	Comments	Sta.	Depth (pm-10/25)	Depth (am-10/26)	Comments
0+90	28	3	tie in	0+90	6	6.5	
0+80	29	3		0+80	7	7	
0+70	29.5	3		0+73	7	6	E. Well
0+60	31	3		0+70	6	0+65 = 6.5	
0+50	32	3		0+60	7		
0+40	34	3	tie in	0+56	7	7.5	W. Well
				0+50	6		
		SF=	1525	0+40	5	8	SF backfilled =1180

IRON/SAND (measure each load, fill to - 10 ft bgs)

Time	Truck No.	Sand (lbs)	Iron (4000lb bgs)	Guar Slurry (gal)	Water (gal)	Temp	Comments
9:40	1	12,000	3	0	300		
10:30	2	12,000	3	0	300		
11:10	3	12,000	3	0	300		
11:30	4	12,000	3	0	300		
	5	12,000	3	0	300		
	6	12,000	3	0	300		
12:50	7	12,000	3	0	300		Unexpected loaded
1:30	8	12,000	3	0	300		train comes thru at
2:00	9	12,000	3	0	300		1:45, trench shakes
	10	12,000	3	0	300		Did trench squeeze?
2:50	11	12,000	3	0	300		
3:05	12	12,000	3	0	300		
3:30	13	12,000	3	0	300		
	14	12,000	3	0	300		
4:15	15	12,000	3	0	300		

BIO-POLYMER SLURRY: (measure twice per shift)

Time	Batch	Location	Visc.	pH	Temp	Comments
7:00		gate 1	75	10.5		prior to backfilling
5:00		gate 1				added 2 cf biostarter and 1/2 gal
						enzyme breaker , after backfilling
	6					

COMMENTS: Dug out gate 1 and backfilled w/ 50/50 Fe/Sand

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

BP DRAIN

Bio-Polymer Slurry Trench w/ Iron/Sand Backfill

DAILY QC RESULTS TECHNICAL SPECIFICATION: ETI Memo Aug 12, 1999

DATE: Tues, Oct 26, 1999 SHIFT NO. 7 INSPECTOR: Steven R. Day
Geo-Solutions

Guar Deliveries

0	TRUCKS TODAY
1	TRUCKS TODATE

EXCAVATION: (measure every 10 lf, 3 ft wide) BACKFILL: (measure am and pm)

Sta.	Depth	Key	Comments	Sta.	Depth	Depth	Comments
			Complete				Backfilled gate 2 w/
							soil bentonite

IRON/SAND (measure each load, fill to - 10 ft bgs)

Time	Truck No.	Sand (lbs)	Iron (4000lb bgs)	Guar Slurry (gal)	Water (gal)	Temp	Comments
							H-C checks and
							confirmed that gate 1
							has a FS>2

BIO-POLYMER SLURRY: (measure twice per shift)

Time	Batch	Location	Visc.	pH	Temp	Comments
7:00		gate 2				water level down 30"
9:00						pumped water from gate 2 to gate 1
7:30		gate1	30	12	58	top
12:30		gate1 W well	26	12	78	SLURRY IS BROKEN
						added 4 gal breaker and 2 gal 30%
						muratic acid
			Using 2 pumps, developed wells from 12:30 to 7:30			

COMMENTS: Pumping from wells at 1-5 gpm/ea, into wells at 10 to 100 gpm/ea

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

BP DRAIN

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

Bio-Polymer Slurry Trench w/ Iron/Sand Backfill

DAILY QC RESULTS | TECHNICAL SPECIFICATION: ETI Memo Aug 12, 1999

DATE: Thurs, Oct 28, 1999 | SHIFT NO. 8+9 | INSPECTOR: Steven R. Day, Geo-Solutions

Guar Deliveries: 0 TRUCKS TODAY; 1 TRUCKS TODATE

EXCAVATION: (measure every 10 lf, 3 ft wide) BACKFILL: (measure am and pm)

Sta.	Depth	Key	Comments	Sta.	Depth	Depth	Comments
			Complete				

IRON/SAND (measure each load, fill to - 10 ft bgs)

Time	Truck No.	Sand (lbs)	Iron (4000lb bgs)	Guar Slurry (gal)	Water (gal)		Comments
							Complete

BIO-POLYMER SLURRY: (measure twice per shift)

Time	Batch	Location	Visc.	pH	Temp	Comments
27-Oct		Broken slurry recirculated and pumped into wells using 2 pumps, total 50 to 100 gpm				
		Total pumping time > 24 hours, water level down 3 "				
28-Oct		Pumping w/one pump into and out of wells				added 10 gal 20% muratic acid
12:20		trench		12		water level down 4"
3:15		W well	26	12		SLURRY IS BROKEN
5:00		trench	26	9		after acid
						Pumped 13 hours today

COMMENTS: Total pumping time = 51 hours
Pore volumes pumped @ 30% porosity & 5 gpm = 3+ pore volumes
SLURRY IS BROKEN, TRENCH IS FLUSHED, East well ok, West well only usable with 1.25 tubing

SIGNED: _____ Contractor's QC Supervisor

SIGNED: _____ Owner's Representative

Geo-Solutions

CB Slurry Wall

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Wed: 10/20/1999 SHIFT NO. 11 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES:	0	TRUCKS TODAY	CEM. DELIVERIES:	0	TRUCKS TODAY
	2	TRUCKS TODATE		5	TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2.5 ft wide)

Sta.	Depth	Key	Comments	Sta.	Depth	Key	Comments
Panel 10							
1+14			Started exc when encountered an unknown buried utility. Stopped work at 12:15				
1+37							
			SF TODAY =	0		SF TODATE	5211
						% Complete	88%

Bentonite Slurry Cement Bentonite Slurry

Time	Visc (MF sec)	Density (pcf)	Comment	Time	Batch (#)	Density (pcf)	Comment
9:20-11:30	plant down due to starter coil failure with mix plant						
11:40	36	64		12:15	5		Stopped work
				TODAY	5	14.25	

COMMENTS:

Late start due to other work. Plant down 9:20 to 11:30 to find and replace starter coil. Hit unknown buried utility at 12:15. Rest of day spent plugging utility from manhole.

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Geo-Solutions

CB Slurry Wall

PROJECT NAME **Funnel and Gate**
PROJECT NAME **A & B Terminals**
PROJECT LOCATION **Ballard, WA**

Cement-Bentonite Slurry Wall

DAILY QC RESULTS TECHNICAL SPECIFICATION: PCA Std.

DATE: Thurs: 10/21/1999 SHIFT NO. 12 INSPECTOR: Steven R. Day
Geo-Solutions

BENTO. DELIVERIES:			CEM. DELIVERIES:		
	0	TRUCKS TODAY		0	TRUCKS TODAY
	2	TRUCKS TODATE		5	TRUCKS TODATE

EXCAVATION: (measure every 10 lf) (2.5 ft wide)

Sta.	Depth	Key	Comments	Sta.	Depth	Key	Comments
Panel 10							
1+14	24	3	Overlap with previous panel				
1+20	24	3	dug around steel encased storm sewer (~12 ft deep) at 1+14				
1+25	24	3					
1+37	24	3	Overlaps with previous panel				
			complete at 10:20				
			Exc complete				
			SF TODAY =	552		SF TODATE	5763
						% Complete	100%

Bentonite Slurry Cement Bentonite Slurry

Time	Visc	Density	Comment	Time	Batch	Density	Comment
	(MF sec)	(pcf)			(#)	(pcf)	
7:45	37	64		8:00	4	72.5	
				10:30	9		Complete last panel
				11:00	3		Topoff 0+30
				TODAY	16	45.6	

COMMENTS:

CB funnel complete

Panel	Sta to Sta	SF	OB
7	0+90 - 1+14	617	2.09
8	0+25 - 0+40	458	2.53
9	0+20 - 0+25	147	2.57
10	1+14 - 1+37	552	1.15

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

HARTCROWSER

FIELD REPORT

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

Job No. 4063-10
Field Report No. 1
Page 1 of 1
DATE 10/4/99
S M T W Th F S

JOB Jacobsen Terminals - Iron wall — ARRIVAL TIME: 0800
LOCATION Ballard - Seattle, WA — DEPARTURE TIME: 1345
CLIENT A + B Jacobsen LLC — WEATHER: Sunny - cool
PURPOSE OF OBSERVATIONS Construction oversight
H-C REPRESENTATIVE Derek Ormerod — H C PROJECT MANAGER D. Hillman
CONTRACTOR Remtech / GeoSolutions — PERMIT NO. —
CONTRACTOR REP. Mark / Steve Day — JOB PHONE 785-8978

COMMENTS: HC rep onsite and meeting w/ Remtech & GeoSolutions to discuss various parts of the project. Remtech is tearing up the existing asphalt and having it hauled off-site. They are also recieving all of the sand, cement, bentonite, & guar gum (the iron filings were hauled in by mil last week) needed for the project. Remtech then leveled the area to be excavated for the ditch, so the excavator would have a flat surface to work. GeoSolutions is waiting for the arrival of their backhoe mixing equipment tomorrow. So after site prep work and moving equipment all leave the site.

BY: Derek Ormerod
HART CROWSER REPRESENTATIVE

REVIEWED BY: BLK
HART CROWSER PROJECT MANAGER

I have read and understand the content of this Field Report.
CONTRACTOR REPRESENTATIVE

HARTCROWSER

FIELD REPORT

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

Job No. 4063-10
Field Report No. 2
Page 1 of
DATE 10/5/99
S M (T) W Th F S

JOB Jacobsen Terminals - Iron Wall
ARRIVAL TIME: 0745
LOCATION Ballard - Seattle, WA
DEPARTURE TIME: 1645
CLIENT A&B Jacobsen LLC
WEATHER: Overcast
PURPOSE OF OBSERVATIONS construction oversight
H-C REPRESENTATIVE Derek Ormerod
H C PROJECT MANAGER Doug Hillman
CONTRACTOR Rentech / Geosolutions
PERMIT NO.
CONTRACTOR REP. Mark / Steve
JOB PHONE 206-784-8578

COMMENTS: HC rep arrives onsite. Rentech is placing visqueen over the exterior berm and filling the water tank. Still waiting for the mixing/batch equipment to arrive. HC rep marks off location of wall turning points and gates on the ground - measured off the centerline of the RR tracks and finding the actual locations of the wells and drain that are going to end up under the City of Seattle fill. Rentech then removing vegetation from this fill area. 0945 the batch plant arrives - Rentech helps setup. After this they run a trial batch to get everyone oriented and to determine the proper mix volumes. Then Rentech begins digging around the water line that crosses the wall. They are going to pour concrete & reinforce with rebar to support the line during excavation. While doing this they hit and knock out an unmarked stub and create a water leak. The water dept. shows up, turns off the line and repairs the break

BY: DO
HART CROWSER REPRESENTATIVE

REVIEWED BY: BLK
HART CROWSER PROJECT MANAGER

I have read and understand the content of this Field Report.
CONTRACTOR REPRESENTATIVE

HARTCROWSER

FIELD REPORT

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

Job No. 4063-10
Field Report No. 3
Page 1 of 1
DATE 10/6/04
S M T (W) Th F S

JOB Jacobson - Iron Wall ARRIVAL TIME: 0800
LOCATION Ballard DEPARTURE TIME:
CLIENT Jacobson LLC - WEATHER: Pt Cloudy
PURPOSE OF OBSERVATIONS Construction oversight
H-C REPRESENTATIVE Derek Osmond H C PROJECT MANAGER Doug Hillman
CONTRACTOR Puntech / Geosolutions PERMIT NO. -
CONTRACTOR REP. Mark / Steve JOB PHONE 781-8878

This report presents opinions formed as a result of our observation of the contractor's activities relating to geotechnical engineering. We rely on the contractor to comply with the plans and specifications throughout the duration of the project irrespective of the presence of the Hart Crowser representative. The presence of our field representative will be for the purpose of providing observation and field testing. Our work does not include supervision or direction of the actual work of the contractor, his employees or agents. Neither the presence of our representative nor the observation and testing by our firm shall excuse the contractor in any way for defects discovered in his work. Our firm will not be responsible for job or site safety on this project. The conclusions and recommendations of this field report are subject to review by the Hart Crowser Project Manager.

COMMENTS: HC rep on-site. Puntech is back excavating the water line again after water department repairs last night. Geo solutions is mixing the first batch of C-B slurry - working on the viscosity. Before breaking ground we all have a safety meeting to discuss the site hazards. After unloading a new truck arrival, we break ground. We dig down a few feet before adding the slurry to the trench. At approximately 0+10 station we hit the fill (desired aquitard layer) at 21' and, after some difficulty excavating the layer we proceeded to 26' depth. We have started on the west end of the trench doing the "wing" section. From previous explorations we know this soil is potentially uncontaminated, therefore it is being designated as a PNCS, pending analytical results (lab on-site tomorrow). We then continue excavating through station 0+20 when the excavator began having mechanical difficulty. We are able to dig to 29' depth, 2' into the fill layer before we must stop due to the excavator breaking down. In the meantime, Salmon Bay has arrived with a load of concrete, which is poured around the water line and reinforced with rebar to provide extra support.

BY: DO REVIEWED BY: BK I have read and understand the content of this Field Report.

HARTCROWSER
FIELD REPORT

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

Job No. 4063-10
Field Report No. 4
Page 1 of 1
DATE 10/7/99
S M T W (Th) F S

JOB Jacobson - Iron Wall
ARRIVAL TIME: 0900
LOCATION Ballard
DEPARTURE TIME: 1500
CLIENT A & B Jacobson LLC
WEATHER: Cloudy - occasional rain
PURPOSE OF OBSERVATIONS Construction oversight
H-C REPRESENTATIVE Derek Overstreet
H C PROJECT MANAGER Doug Hilbrun
CONTRACTOR Rentech / Geosolutions
PERMIT NO. —
CONTRACTOR REP. Mark Henry / Steve Day
JOB PHONE 789-8978

This report presents opinions formed as a result of our observation of the contractor's activities relating to geotechnical engineering. We rely on the contractor to comply with the plans and specifications throughout the duration of the project irrespective of the presence of the Hart Crowser representative. The presence of our field representative will be for the purpose of providing observation and field testing. Our work does not include supervision or direction of the actual work of the contractor, his employees or agents. Neither the presence of our representative nor the observation and testing by our firm shall excuse the contractor in any way for defects discovered in his work. Our firm will not be responsible for job or site safety on this project. The conclusions and recommendations of this field report are subject to review by the Hart Crowser Project Manager.

COMMENTS: HC rep onsite. Rentech is locating another excavator that will arrive tomorrow, so no digging will occur today. It should arrive tomorrow morning. The new excavator will be able to dig to 25' depth, so the old one (42' depth capacity) will remain on-site for the deeper sections. Meanwhile, Rentech is backfilling the waterline concrete trench and building a containment area for the potentially contaminated stockpile (PCS). HC rep is collecting water samples from 4 wells on the Jacobson terminals property, and collecting proctor samples for both the City of Seattle Fill area and the RR track fill. TEG mobile lab has arrived on-site and is analyzing the stockpile samples and the water samples.

BY: [signature]
HART CROWSER REPRESENTATIVE

REVIEWED BY: BLK
HART CROWSER PROJECT MANAGER

I have read and understand the content of this Field Report.
CONTRACTOR REPRESENTATIVE

HARTCROWSER
FIELD REPORT

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

Job No. 4063-10
Field Report No. 5
Page 1 of 1
DATE 10/8/99
S M T W Th (F) S

JOB Jacobson ~~[illegible]~~ - Iron Wall
ARRIVAL TIME: 0800
LOCATION Ballard
DEPARTURE TIME: 1830
CLIENT Jacobson LLC
WEATHER: Rain
PURPOSE OF OBSERVATIONS Construction oversight
H-C REPRESENTATIVE Derek Ormerod
H C PROJECT MANAGER Doug Hillman
CONTRACTOR Remtech / Creosolutions
PERMIT NO. —
CONTRACTOR REP. Mark Henry / Steve Day
JOB PHONE 785-8978

COMMENTS: HC rep on-site ~~[illegible]~~ waiting on the arrival of the new excavator. RR workers (B.N. contractors) dismantling the tracks and ties. After excavator ~~[illegible]~~ arrives we begin digging the "wing" stretch that crosses the RR tracks. We ~~[illegible]~~ dug the trench further to the South than the connecting line by approximately 10' to ensure overlap and to facilitate tie in with the stretch that parallels the tracks. We are determining till depth ~~[illegible]~~ by the ~~[illegible]~~ action of the excavator and then visual inspection using a weighted tape measure to determine the depth. The trench is continued ~~[illegible]~~ NE to the ~~[illegible]~~ encased water line crossing. Due to space constrictions of the building we are unable to dig N of the water line so we will have to come back after the grout stabilizes and dig from the other direction and connect up under the water line.

BY: DLO
HART CROWSER REPRESENTATIVE

REVIEWED BY: BLK
HART CROWSER PROJECT MANAGER

I have read and understand the content of this Field Report.
CONTRACTOR REPRESENTATIVE

HARTCROWSER

FIELD REPORT

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

Job No. 4063-10
Field Report No. 6
Page 1 of 1
DATE 10/9/19
S M T W Th F (S)

JOB Jacobson - Iron Wall
ARRIVAL TIME: 0800
LOCATION Ballard
DEPARTURE TIME: 1700
CLIENT Jacobson LLC
WEATHER: Mostly sunny - nice
PURPOSE OF OBSERVATIONS construction oversight
H-C REPRESENTATIVE Derek Ormerod
H C PROJECT MANAGER Doug Hilman
CONTRACTOR Rentech / Grosolutions
PERMIT NO. -
CONTRACTOR REP. Mark Henry / Steve Day
JOB PHONE 789-8978

COMMENTS: HC rep onsite. Rentech is moving the "clean" stockpile down to the west end of the site and trying to consolidate the "dirty" stockpile. We are discussing options for our "dirty" pile, since we seem to be running out of room. We start digging on the west side of gate #2 after approximately 10', with 10' depth the grout pump becomes clogged / broken. Another will be arriving @ ~2pm. In the mean time this one is being removed and cleaned. Since our "dirty" stockpile has come back clean (non-detect on all three samples) Rentech is moving the pile down with the clean pile. By the time the pump is reassembled and the new one arrives (it will stay on site for backup) it is too late to continue. Rentech & HC dig 3 test pits to determine surface contamination to find suitable material to build another containment cell.

BY:

REVIEWED BY: BLK

I have read and understand the content of this Field Report.

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

FIELD REPORT

Job No. 4063-10
Field Report No. 7
Page 1 of 1
DATE 10 | 10 | 94
(S) M T W Th F S

JOB Jacobsen - Iron Wall ARRIVAL TIME: 0800
LOCATION Ballard DEPARTURE TIME:
CLIENT Jacobsen LLC WEATHER: Pt Cloudy - nice
PURPOSE OF OBSERVATIONS construction oversight
H-C REPRESENTATIVE Derek Ormrod H C PROJECT MANAGER Doug Hillman
CONTRACTOR Rentech / Geosolutions PERMIT NO. —
CONTRACTOR REP. Mark Henry / Steve Day JOB PHONE 789-8978

COMMENTS: HC rep on-site. We start digging the trench on the eastern most "wing" section near the Fenton (former) bldg. We will tie this section in with our excavation from Friday under the water line. After digging 15' of trench a hydraulic line breaks, stopping production.

BY: REVIEWED BY: I have read and understand the content of this Field Report.

RLK

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FIELD REPORT

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Job No. 4063-10
Field Report No. 8
Page 1 of
DATE 10-11-99 S (M) T W Th F S

JOB Jacobson ARRIVAL TIME: 08:00
LOCATION Jacobson Terminals DEPARTURE TIME: 17:00
CLIENT Jacobson WEATHER: Cloudy
PURPOSE OF OBSERVATIONS Construction Oversight
H-C REPRESENTATIVE JJP / DO H C PROJECT MANAGER DLH
CONTRACTOR Remtech PERMIT NO.
CONTRACTOR REP. Aaron JOB PHONE

This report presents opinions formed as a result of our observation of the contractor's activities relating to geotechnical engineering. We rely on the contractor to comply with the plans and specifications throughout the duration of the project irrespective of the presence of the Hart Crowser representative. The presence of our field representative will be for the purpose of providing observation and field testing. Our work does not include supervision or direction of the actual work of the contractor, his employees or agents. Neither the presence of our representative nor the observation and testing by our firm shall excuse the contractor in any way for defects discovered in his work. Our firm will not be responsible for job or site safety on this project. The conclusions and recommendations of this field report are subject to review by the Hart Crowser Project Manager.

COMMENTS: HC rep (DO) on site 07:00. JJP met at 08:00. Remtech arrived 08:30. Hydraulic hose on trackhoe replaced. Area N. of RR. between Two C-B wall sections excavated and filled with C-B slurry to tie-in sections. Excavated material classified as PC-2. Chemical results less than 1 mg/kg PCE. Client + PM confirm that City OK'd use of Method B Direct contact limits (PCE: 19.6 ppm). All stockpiled soils so far OK'd for on-site fill from a chemical basis.

11:15 - 11:45 Norm Peck, DOE on-site

11:20 Tied in to C-B sections N. of RR. at 24-25' depth.

Use soil S. of RR as berm material (0<5' depth)

13:30 Start wall excavation W. of R.R. overlap 10' past ~~wall~~ wing intersection to ensure tie-in.

~~W~~ Station	Depth	
wing intersection	25'	
5' E of ~~wing~~ wing intersec.	24'	
5' W of intersec.	24.5'	
~~2+73~~ 2+63	24'	~3'↑ in hard (dry) silt
~~2+58~~ 2+58	24'	
~~2+53~~ 2+53	23.5'	
~~2+48~~ 2.48	24'	
W. edge of W. gate	25'	

(bracketed rows, left margin: Dressed to 2+68 tie in)

length of wall: E. end to wing wall: 64'
length between wing & Gate 2: 27'

17:00 HC rep leaves site.

BY: REVIEWED BY: BLK

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FIELD REPORT

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206.324.9530

Job No. 4063-10
Field Report No. 9
Page 1 of
DATE Tues 10-12-99
S M (T) W Th F S

JOB Jamestown
ARRIVAL TIME: 07:30
LOCATION Jamestown Terminals
DEPARTURE TIME: 17:00
CLIENT ABB Jamestown
WEATHER: Cloudy
PURPOSE OF OBSERVATIONS Oversight of SMW Wall Construction
H-C REPRESENTATIVE JJP
H C PROJECT MANAGER DLH
CONTRACTOR Rembitch
PERMIT NO.
CONTRACTOR REP. Aaron
JOB PHONE

COMMENTS: Trench N. of R.R. filled with above water table soil excavated + top 5' of soil from area S. of the R.R.

Paint thinner odor in top 3' of soil around station 1+60.

Excavate wall ~~Gate~~ W of Gate 2. W. edge of Gate at 1+92.

Station	wall depth
1+94	24'
1+92	25'
1+87	23'
1+82	25'
1+75	24'
1+72	24'
1+62	24'
1+52	24'
1+47	25'
1+42	24'
1+37	26'

13:30 flat tire on dump truck.

Steelpiles PC-3 (E of Gate 2, S W. of RR), PC-4 (first 30' W of Gate 2) clean. PC-3 Volume: 96 CY PC-4 Volume: 96 CY

15" Storm Drain at 1+10 uncovered at 11.5' Depth. Clay Pipe broke while uncovered. Slight flow to the South.

BY: 17:00 HC Rep left site REVIEWED BY:

I have read and understand the content of this Field Report.

BLR

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FIELD REPORT

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206.324.9530

Job No. 4063-10
Field Report No. 10
Page 1 of
DATE 10-13-99
S M T (W) Th F S

JOB Jacobson
ARRIVAL TIME: 07:10
LOCATION Jacobson Terminals
DEPARTURE TIME: 13:10
CLIENT ~~M & B~~ J & B Jacobson
WEATHER: Rain
PURPOSE OF OBSERVATIONS Construction Oversight - Fe Wall
H-C REPRESENTATIVE JJP
H C PROJECT MANAGER DLH
CONTRACTOR Rotech / Geosolutions
PERMIT NO.
CONTRACTOR REP. Aaron / Steve
JOB PHONE

COMMENTS: Lab Results from Steelpile PC-5 under ~~station~~ active levels. Designate as chemically suitable fill. Railroad installed. RR owner directed full compaction, + RR replacement and did not require compaction testing. ~~We~~ decided that the storm drain crossed by CB wall could be abandoned. A gap sewed with a rubber boot with hose clamps to be secured to culvert.

BY:
REVIEWED BY: BLK
I have read and understand the content of this Field Report.

HARTCROWSER

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Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

Job No. 4083-10

Field Report No. 11

Page 1 of

Job Jacobsen

Date 10-14-99

HC Rep on site 7:45. Storm drain capped at both ends 6 feet between sections. very slow leak of slurry into storm drain.

Station	Depth
Storm drain	26'
0+90	28'
0+95	27'

Stockpile soil from section 0+90 → 1+16 in PC-6. (110 CY)

Stockpile soil from section 0+20 → 0+45 in PC-7 (160 CY)

silty till at 0+45 at 29.5'

Station	Depth
0+43	30'
0+38	34'
0+32	30'
0+28	29'
0+25	25'
0+47	30'

Backhoe broke at 18:40.

Flush slurry in storm drain with water.

18:50 HC Rep off-site.

BY: Jeremy J. Porter
HART CROWSER REPRESENTATIVE

REVIEWED BY: BLK
HART CROWSER PROJECT MANAGER

I have read and understand the content of this Field Report.

CONTRACTOR REPRESENTATIVE

HARTCROWSER

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206.324.9530

Job No. 4063-10

Field Report No. 12

Page 1 of

Job Jamison

Date 10-15-99

0710 HC Rep on site

Rentech Bench down 3'. Excavate 0+20 → 0+28.

No leakage into storm drain of slurry.

Station	Depth
0+31	29'
0+26	28'
0+23	26' → excavate further
0+20	29'

Add 54 CY to PC-7 (PC-7 S-4, S-5)

Provided copies of lab data for stockpiles to Rentech.

1220 HC Rep off-site

BY:

REVIEWED BY: BLK

I have read and understand the content of this Field Report.

HART CROWSER REPRESENTATIVE

HART CROWSER PROJECT MANAGER

CONTRACTOR REPRESENTATIVE

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Job No. 4063-10

Field Report No. 13

Page 1 of

Job Jacobsen

Date 10-18-99

0730 HC Rep on-site

1000 Excavate Cuts 2

1110 Norm Peck DOE on-site

1345 Silty fill @ 22' @ 2+15

Station	Depth
2+35	25'
2+30	25'
2+25	25.5'
2+20	25'

1510 Mixture sand in Cement Truck. Add pea gravel slurry. Mixture deemed not pumpable. Add mixture w/truckhoe to hopper w/ 10' long, 18" dia corrugated pipe tremie tube.

Set 6" tremie pipe at 2+20, 1' from S. side of trench and 15' from ~~west~~ end of gate. Pipe 15' ~~from~~ 20-slot PVC + 15' PVC blank. Set at ≈ 23'. Set through 18" tremie pipe + hopper, and support by filling in sand around 18" tremie pipe.

1600 Temperature of fc/sand mix (no slurry added) = 100°F after mixing. Add 200-300 gal H_2O/truck to cool down (85°F).

6'-3' of fc/sand between 2+35 → 2+20.

1930 HC rep off site.

BY:

REVIEWED BY:

I have read and understand the content of this Field Report.

BLK

HART CROWSER REPRESENTATIVE

HART CROWSER PROJECT MANAGER

CONTRACTOR REPRESENTATIVE

HARTCROWSER

FIELD REPORT

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206.324.9530

Job No. 4063-10
Field Report No. 14
Page _____ of _____
DATE 10-19-99
S M (T) W Th F S

JOB Jacobsen ARRIVAL TIME: _____
LOCATION Ballard DEPARTURE TIME: _____
CLIENT ALB Jacobsen WEATHER: Sunny
PURPOSE OF OBSERVATIONS _____
H-C REPRESENTATIVE JJP H C PROJECT MANAGER DLH
CONTRACTOR Rentech PERMIT NO. _____
CONTRACTOR REP. _____ JOB PHONE _____

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COMMENTS: 0715 HC Rep on site.
Fill Gate 2 w/ Fe/sand slurry (50/50 by wt) 46/54 by vol.)
using cement mixer, conveyor belt, and 10' lexan tube.
Samples 12 tubes (9 today, 3 yesterday) used.
Depths to 8'-9.5' throughout gate. Lot consolidate.
Stockpile from Gate 2 in PC-8. Samples clean.
Est Vol: 160 CY. 5 samples taken.
~~1535 HC Rep off~~
Calcium Hypochlorite spread on bedding mat in gate to
break down green gum.
1530 HC Rep off site.

BY: Mary L. Porter REVIEWED BY: BLK

I have read and understand the content of this Field Report.

HARTCROWSER

FIELD REPORT

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Job No. 4063-10
Field Report No. 15
Page ____ of ____
DATE 10-29-99
S M T (W) Th F S

JOB Jacobson ARRIVAL TIME: 0730
LOCATION Jacobson Terminals DEPARTURE TIME:
CLIENT A&B Jacobsen WEATHER: Fog/Sun
PURPOSE OF OBSERVATIONS
H-C REPRESENTATIVE JJP H C PROJECT MANAGER DLH
CONTRACTOR Remtech PERMIT NO.
CONTRACTOR REP. JOB PHONE

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COMMENTS: 0730 HC rep on site.
Iron/Sand gate 7-8' deep.
Water pumped yesterday from fill area. Some slurry left - too thick to pump.
1145 start wall between 1+14 → 1+37.
1240 hit sanitary sewer line ≈12' deep, at 1+20.
Notify Doug A. Slight flow from sewer line into downstream manhole. Does not look like slurry.
Slurry level in trench constant.
Remtech will enter manhole & plug line with inflatable plug (max backpressure = 15 psi).
1600 Steve Day adds LOB-H enzyme breaker and stirs out to Gate 2, recirculates slurry with trash pump.
1700 Aaron seals off Sanitary Sewer w/12" plug inflated to 25 psig. O_2, LEL, H_2S, CO, VOC monitored. O_2 = 20.6% (ambient)
VOC = 0.2 ppm. CO, H_2S, LEL = 0. 1705 Exit hole.
1710 Storm drain sealed off w/ 18" plug inflated to 20 psig. O_2 = 20.5% - 20.3%. VOC, CO, H_2S, LEL = 0.
1720 Exit hole, replace cover.
1745 HC Rep off site.

BY: REVIEWED BY: BLK I have read and understand the content of this Field Report.

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FIELD REPORT

Hart Crowser, Inc.
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206.324.9530

Job No. 4063-10
Field Report No. 16
Page 1 of
DATE 10/21/99
S M T W TH F S

JOB Jacobsen - Iron Wall
ARRIVAL TIME: 0800
LOCATION Ballard
DEPARTURE TIME:
CLIENT A+B Jacobsen
WEATHER: Fog, some sun
PURPOSE OF OBSERVATIONS Construction oversight
H-C REPRESENTATIVE Derek Ormrod
H C PROJECT MANAGER DCH
CONTRACTOR Rentech / Geosolutions
PERMIT NO. -
CONTRACTOR REP. Mark or Aaron / Steve Day
JOB PHONE

COMMENTS: HC rep on-site. Steve Day fixing his pump to get better flow. After fix, Rentech is digging around the newly discarded steel-encased sewer pipe. Finish the last C-B section and top off all of the other C-B sections, then switch over batch plant to guar gum. Starting to excavate top few feet of gate #1, However, there is too much water on top of the excavation (from the previous gate) and Rentech will need a location to move it when they start to place iron filings and displace the current guar gum. They are going to move some excess soil off-site and possibly trench some areas to create room for the water displacement. Additionally, due to high pH there is some difficulty getting the guar gum in the first gate (#2) to break, it is happening, but slowly

Depths:

1+38	24'
1+27	24'
1+33	24'
1+25	24' (~ pipe area)
1+20	24'
1+14	24'

BY: DCH
REVIEWED BY: BLK
I have read and understand the content of this Field Report.
HART CROWSER REPRESENTATIVE
HART CROWSER PROJECT MANAGER
CONTRACTOR REPRESENTATIVE

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FIELD REPORT

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Job No. 4063-10
Field Report No. 17
Page 1 of 1
DATE 10/22/99
S M T W Th (F) S

JOB Jacobson - Iron Wall
ARRIVAL TIME: 0745
LOCATION Ballard
DEPARTURE TIME: 1600
CLIENT A & B Jacobson
WEATHER: Fog, then sun
PURPOSE OF OBSERVATIONS Construction oversight
H-C REPRESENTATIVE Derek Onwood
H C PROJECT MANAGER DLH
CONTRACTOR Rentech / Geosolutions
PERMIT NO. -
CONTRACTOR REP. Mark or Aaron / Steve Day
JOB PHONE

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COMMENTS: HC rep onsite. Rentech is loading trucks to be removed to Rabanco, but no one has contacted Rabanco. HC rep does necessary paperwork to get acceptance of material, in the mean time the trucks are waiting. Steve Day continues to recirculate the water/guar gum in gate #2 - the pH & Marsh funnel numbers are dropping, but slowly. 1515 Rabanco calls & accepts material - send trucks. All off-site

note: HC rep has collected and submitted samples for lime mixing in the City of Seattle fill area to reduce the moisture content and get compaction. Samples submitted to HC geotech lab (with lime) and moisture contents being run at several different lime contents (1%, 2%, 3%, 5%) and a proctor with 2% lime (by weight)

BY: Derek Onwood
HART CROWSER REPRESENTATIVE

REVIEWED BY: BLK
HART CROWSER PROJECT MANAGER

I have read and understand the content of this Field Report.
CONTRACTOR REPRESENTATIVE

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FIELD REPORT

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Job No. 4063-10
Field Report No. 18
Page 1 of 1
DATE 10/25/97
S (M) T W Th F S

JOB Jacobson - Iron wall ARRIVAL TIME: 0745
LOCATION Ballard DEPARTURE TIME: 1730
CLIENT A & B Jacobson WEATHER: Overcast - Some rain
PURPOSE OF OBSERVATIONS Construction oversight
H-C REPRESENTATIVE Derek Ormerod H C PROJECT MANAGER DLH
CONTRACTOR Rentech / Groesolutions PERMIT NO. -
CONTRACTOR REP. Mark or Aaron / Steve Day JOB PHONE -

This report presents opinions formed as a result of our observation of the contractor's activities relating to geotechnical engineering. We rely on the contractor to comply with the plans and specifications throughout the duration of the project irrespective of the presence of the Hart Crowser representative. The presence of our field representative will be for the purpose of providing observation and field testing. Our work does not include supervision or direction of the actual work of the contractor, his employees or agents. Neither the presence of our representative nor the observation and testing by our firm shall excuse the contractor in any way for defects discovered in his work. Our firm will not be responsible for job or site safety on this project. The conclusions and recommendations of this field report are subject to review by the Hart Crowser Project Manager.

COMMENTS: HC rep on-site. Rentech & Groesolutions have worked over the weekend - Rentech removed more soil to Rabanco and continued excavating the gate #1 trench. Steve Day finally got guar to break in gate #2 and the water level in the trench has dropped over 2'. He has then recirculated 3 gate volumes (i.e. developed the gate)

Today: HC rep had Rentech continue to dig the section of trench they had started over the weekend. Verified depth with visual inspection of material and sounding trench. At this point they have reached depth in approximately 25' of the 50' trench. They start to place iron/sand mix in the east end of the gate, while excavating out of the west end. They have run out of guar, so this is necessary to keep the excavation full, however very little iron/sand mix seems to be removed from the trench as they are excavating. They continue to dig and fill trench until they reach the C-B wall on the west side. Then the Iron is filled to 6-7' depth (below grade) throughout the trench. Total of 15 trucks: 6 tons of sand + 6 tons of iron per truck.

Depths:

0+90	28'	0+65	30.5'	0+40	3+
0+85	25'	0+60	31'	(fill @ 28')	
0+80	25'	0+55	32	(fill @ 29')	
0+75	29.5'	0+50	32		
0+70	30.5'	0+45	33		

BY: REVIEWED BY: I have read and understand the content of this Field Report.

DLH BLK

HART CROWSER REPRESENTATIVE HART CROWSER PROJECT MANAGER CONTRACTOR REPRESENTATIVE

APPENDIX B
PHOTOGRAPHS OF WALL CONSTRUCTION

Photograph B-1 Area north of railroad tracks prior to fill.

Photograph B-2 Area south of railroad tracks prior to excavation.

Photograph B-3 Protection of water line with concrete.

Photograph B-4 Compaction of fill beneath railroad tracks.

Photograph B5 Excavation of trench for cement-bentonite slurry

Photograph B-6
Filling grates with iron-sand mixture.

Photograph B7 Restoration of storm drain in fill area north of railroad tracks.

Photograph B-8
Excavated area after backfill.

APPENDIX C
LABORATORY DATA
HART CROWSER, INC. AND
TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

MOISTURE-DENSITY RELATIONSHIP TEST

Test specification: ASTM D 1557-91 Procedure C, Modified

Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			12 %	2.65			5.8 %	

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 123.4 pcf	121.5 pcf	
Optimum moisture = 10.5 %	11.0 %	

Project No.: J-7188

Project: Jacobson Terminal

Location: Lime Mix Sample

Date: 10-27-1999

Remarks:

2% Lime

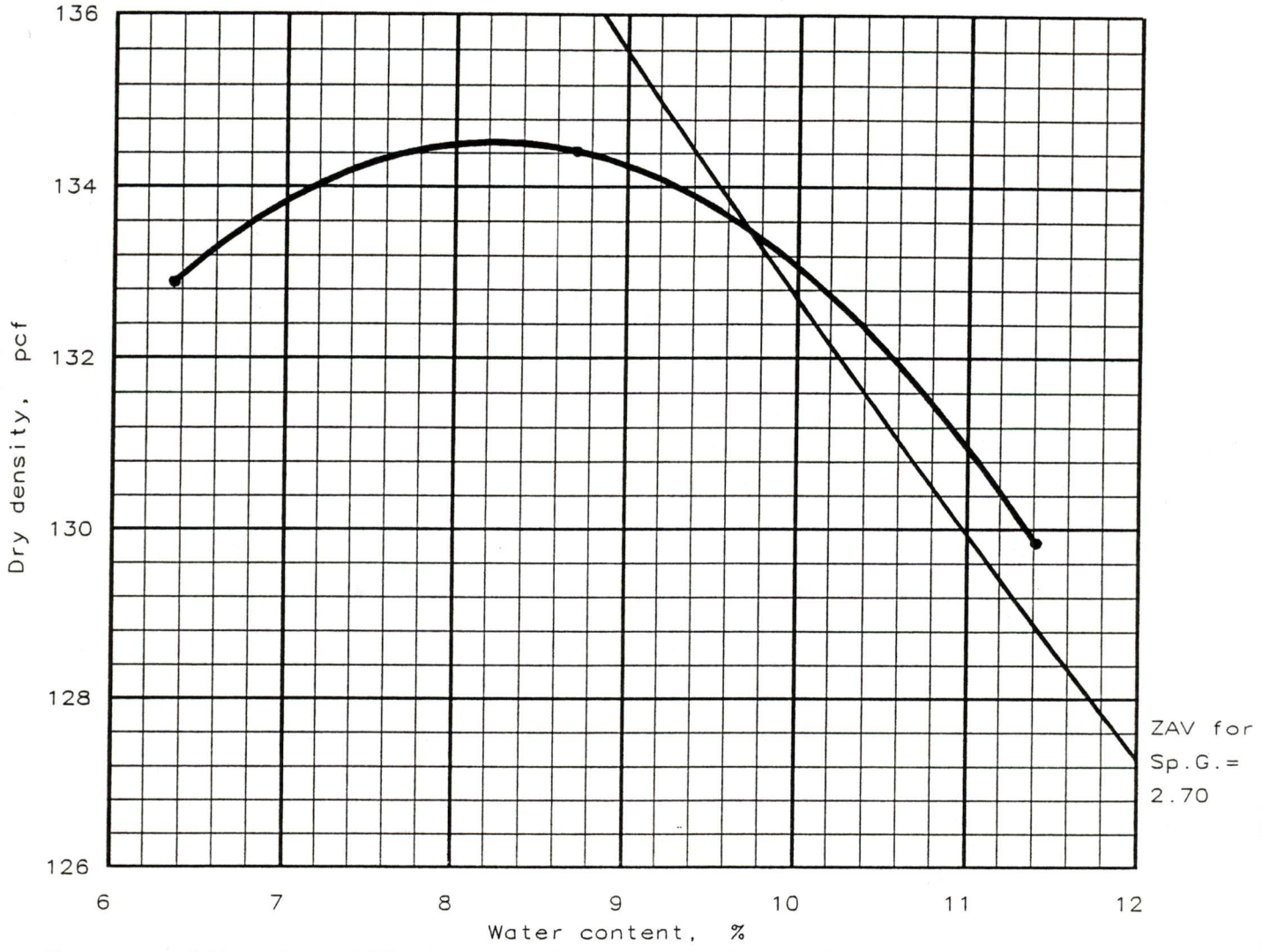
3 day cure

HARTCROWSER

MOISTURE-DENSITY RELATIONSHIP TEST

Figure _____

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 1557-91 Procedure C, Modified

Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			6%	2.65			11 %	

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 137.3 pcf	134.5 pcf	
Optimum moisture = 7.5 %	8.2 %	

Project No.: J-4063-10

Project: Jacobson Terminals

Location: Railroad Tracks FILL

10/7/99

Date: 10-13-1999

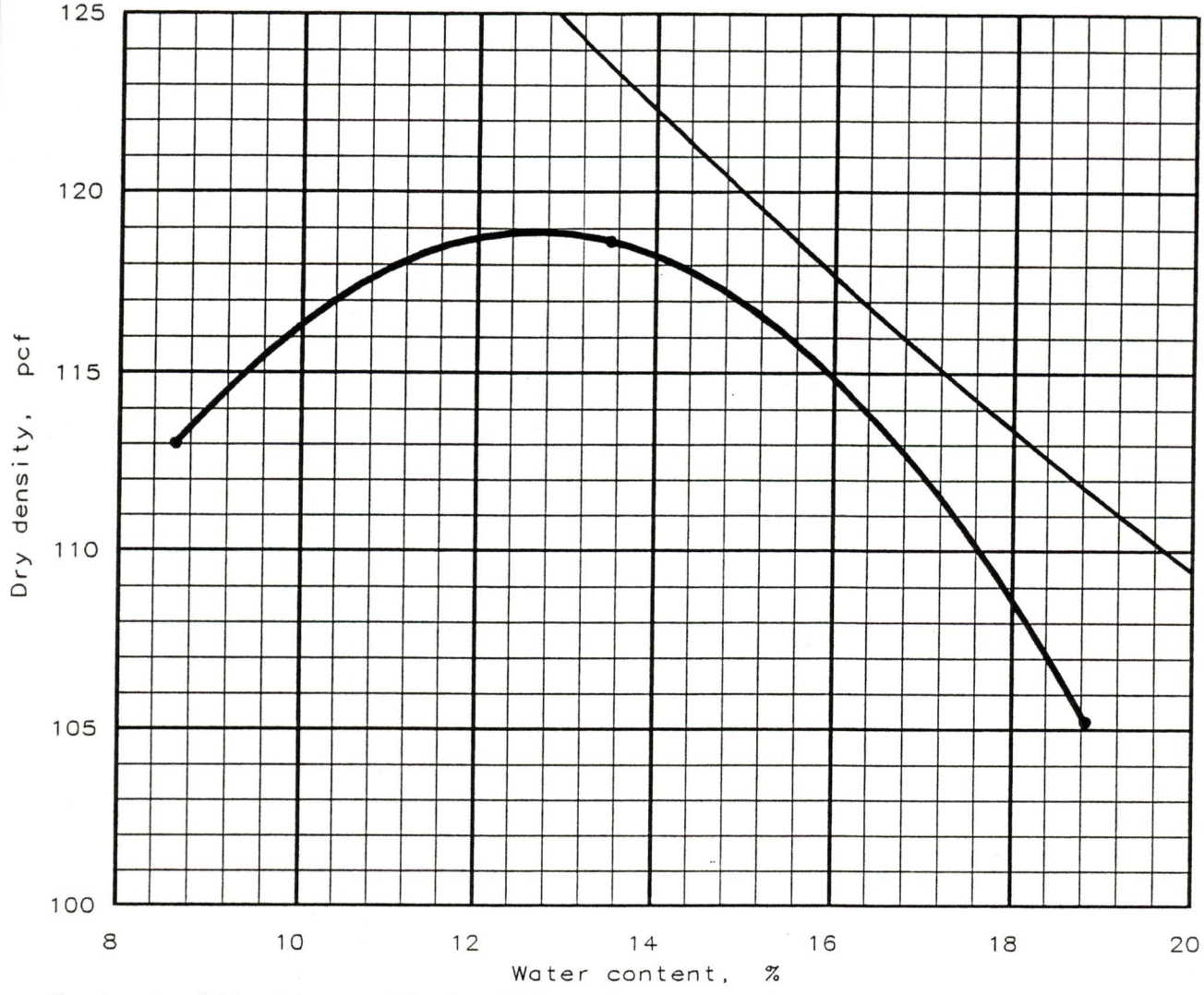
HARTCROWSER

MOISTURE-DENSITY RELATIONSHIP TEST

Remarks:

Figure _____

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 1557-91 Procedure C, Modified

Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			37%	2.65			3%	

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 119.9 pcf Optimum moisture = 12.4 %	118.9 pcf 12.7 %	

Project No.: J-4063-10

Project: Jacobson Terminals

Location: FILL Stockpile 10/7/99

City of Seattle Area

Date: 10-13-1999

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MOISTURE-DENSITY RELATIONSHIP TEST

Remarks:

Figure _____

HARTCROWSER

Page 1 of 1

Job No. 7188

Project Jacobson Terminals

Date 11/1/99

Calculations for Affect of lime admixture

Made by GWK

Lime was mixed with 1-lb. samples of soil to observe affect on moisture content. Weight after curing ~~eight~~ six hours open ~~on~~ at room temperature was noted. Water loss is tabulated below as a percentage of dry weight. Samples were then oven dried. Total moisture is tabulated as a percentage of dry weight. Lime was added as a percentage of ~~wet~~ wet weight.

Sample	% Cure Loss	total moisture
1% Lime	3%	17%
2%	2%	18%
3%	3%	16%
5%	4%	23%
unamended	—	17%

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

800 Sleater-Kinney SE, PMB #262
Lacey, Washington 98503-1127

Mobile Environmental Laboratories
Environmental Sampling Services

Telephone: 360-459-4670
Fax: 360-459-3432

October 29 1999

Doug Hillman
Hart Crowser
1910 Fairview Ave. E
Seattle, WA 98102-3699

Dear Mr. Hillman

Please find enclosed the analytical data report for the Jacobson Terminal project in Ballard, Washington. Mobile Laboratory services were conducted on October 7 – 25, 1999. Soil and water samples were analyzed for Gasoline by NWTPH-Gx, Specific Halogenated Hydrocarbons and BTEX by Method 8021B, and Pb, Cd, Cr, As, Cu, Zn, and Ni by Method 7000 series.

The results of these analyses are summarized in the attached tables. All soil values are reported on a dry weight basis. Applicable detection limits and QA/QC data are included. An invoice for this work has been sent to your accounting department.

TEG Northwest appreciates the opportunity to have provided analytical services to Hart Crowser for this project. It was a pleasure working with you, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A. Korosec
President

QA/QC FOR ANALYTICAL METHODS

GENERAL

The TEG Northwest Laboratory quality assurance and quality control (QA/QC) procedures are conducted following the guidelines and objectives which meet or exceed certification/-accreditation requirements of California DOHS, Washington DOE, and Oregon DEQ. The Quality Control Program is a consistent set of procedures which assures data quality through the use of appropriate blanks, replicate analyses, surrogate spikes, and matrix spikes, and with the use of reference standards that meet or exceed EPA standards.

When analyses are taking place on-site with the mobile lab, the need for Field Blanks or Travel/Trip Blanks is eliminated. If there is going to be a delay before sample preparation for analysis, the sample is stored at 4^{o} C.

ANALYTICAL METHODS

TEG Northwest Labs use analytical methodologies which are in conformity with U. S. Environmental Protection Agency (EPA), Washington DOE, and Oregon DEQ methodologies. When necessary and appropriate due to the nature or composition of the sample, TEG may use variations of the methods which are consistent with recognized standards or variations used by the industry and government laboratories.

TPH-Gasoline, TPH-Diesel
(Gasoline and/or Diesel, Modified EPA 8015, NWTPH-Gx and NWTPH-Dx)

A check standard is run at the beginning of the day. 1) A close standard is run at the end of the day. 2) Both open and close standards must be within 15% of the continuing calibration curve value. All samples are prepared with a surrogate spike, and the recovery must be between 65% and 135% unless high sample concentrations interfere with the determination of the recovery percentage. A duplicate sample is run at a rate of 1 per 10 samples. At least 1 method blank is run per 20 samples analyzed.

Purgeable Volatile Aromatics
(BTEX, EPA 8021B)

A check standard is run at the beginning of the day. The check standard is run at the end of the day. Both open and close standards must be within 15% of the continuing calibration curve value. All samples are prepared with a surrogate spike, and the recovery must be between 65% and 135% unless high sample concentrations interfere with the determination of the recovery percentage. At least 1 method blank is run per day.

Purgeable Volatile Halocarbons
(Chlorinated Hydrocarbons, EPA 601/8021B)

A calibration standard is run at the beginning of the day. The standard must be within 15% of the continuing calibration curve value. The standard is rerun at the end of the day. All samples are prepared with a surrogate spike, and the recovery must be between 65% and 135%. At least 1 method blank is run per day.

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		Method Blank	PC2 S-1	PC2 S-2	PC2 S-3	PC2 S-4	PC2 S-5	Dup PC2 S-5
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DATE ANALYZED	MDL	9/11/99	9/11/99	9/11/99	9/11/99	9/11/99	9/11/99	9/11/99
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd	nd	nd	nd
Toluene	0.05	nd	nd	nd	nd	nd	0.08	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd	nd	nd
Total Xylenes	0.05	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	nd	0.06	nd	0.05	0.05
Chloroform	0.05	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	0.12	0.16	nd	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	0.57	0.83	nd	0.50	0.48	0.44
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd	nd
SURROGATE RECOVERY (%)		109	103	103	130	99	86	88

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		PC5 S-1	PC5 S-2	PC5 S-3
	mg/kg	mg/kg	mg/kg	mg/kg
DATE ANALYZED	MDL	9/12/99	9/12/99	9/12/99
Vinyl chloride	0.25	nd	nd	nd
Benzene	0.05	nd	0.15	nd
Toluene	0.05	nd	nd	0.58
Ethylbenzene	0.05	nd	nd	20
Total Xylenes	0.05	2.6	0.39	92
1,1-Dichloroethene	0.05	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	nd
Chloroform	0.05	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd
SURROGATE RECOVERY (%)		123	106	82

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		Method Blank	PC3 S-1	PC3 S-2	PC3 S-3	PC4 S-1	PC4 S-2	PC4 S-3	Dup PC4 S-1
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DATE ANALYZED	MDL	9/12/99	9/12/99	9/12/99	9/12/99	9/12/99	9/12/99	9/12/99	9/12/99
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd	0.14	nd	0.17	0.10
Toluene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Total Xylenes	0.05	nd	nd	nd	nd	0.58	1.60	0.19	0.58
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd	nd	nd	nd	0.53	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	0.21	nd	nd	nd	0.96	1.70	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
SURROGATE RECOVERY (%)		125	114	86	90	96	101	92	101

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		Method Blank	PC6 S-1	PC6 S-2	PC6 S-3	PC7 S-1	PC7 S-2	PC7 S-3	Dup PC6 S-3
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DATE ANALYZED	MDL	9/14/99	9/14/99	9/14/99	9/14/99	9/14/99	9/14/99	9/14/99	9/14/99
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	0.05	nd	0.16	0.07	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Total Xylenes	0.05	nd	nd	0.12	nd	0.14	nd	0.16	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	1.60	nd	nd	nd	nd	nd	nd
Chloroform	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd	nd	nd	0.37	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	nd	0.09	0.23	0.22	3.90	0.13	0.32
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
SURROGATE RECOVERY (%)		86	87	103	88	112	105	108	113

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		Method Blank	Method Blank	SP - 1 S-1	SP - 1 S-2	SP - 1 S-3	SP - 1 S-4	SP - 1 S-5	SP - 1 S-6
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DATE ANALYZED	MDL	10/7/99	10/8/99	10/7/99	10/7/99	10/7/99	10/8/99	10/8/99	10/8/99
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Total Xylenes	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd	nd	nd	nd	nd	0.11
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	nd	nd	1.8	nd	nd	0.86	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
SURROGATE RECOVERY (%)		92	114	88	98	67	84	80	97

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		Method Blank	PNCS - 2 S - 1	PNCS - 2 S - 2	PNCS - 2 S - 3	PC - 1	PC - 1	PC - 1	Dup PC - 1
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DATE ANALYZED	MDL	10/9/99	10/9/99	10/9/99	10/9/99	10/9/99	10/9/99	10/9/99	10/9/99
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Total Xylenes	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
SURROGATE RECOVERY (%)		81	93	108	11	90	112	93	107

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Water.

SAMPLE DESCRIPTION	(ug/l)	Method Bla nk (ug/l)	T - 1 (ug/l)	T - 1 Dup (ug/l)
DATE ANALYZED	MDL	10/9/99	10/9/99	10/9/99
Vinyl chloride	5.00	nd	nd	nd
Benzene	1.00	nd	nd	nd
Toluene	1.00	nd	nd	nd
Ethylbenzene	1.00	nd	nd	nd
Total Xylenes	1.00	nd	nd	nd
1,1-Dichloroethene	1.00	nd	nd	nd
Methylene chloride	1.00	nd	nd	nd
Trans-1,2-dichlorethene	1.00	nd	nd	nd
1,1-Dichloroethane	1.00	nd	nd	nd
Cis-1,2-dichloroethene	1.00	nd	nd	nd
Chloroform	1.00	nd	nd	nd
1,1,1-Trichloroethane (TCA)	1.00	nd	nd	nd
Carbontetrachloride	1.00	nd	nd	nd
1,2-Dichloroethane	1.00	nd	nd	nd
Trichloroethene (TCE)	1.00	nd	0.86	1.22
1,1,2-Trichloroethane	1.00	nd	nd	nd
Tetrachloroethene (PCE)	1.00	nd	nd	nd
1,1,1,2-Tetrachloroethane	1.00	nd	nd	nd
1,1,2,2-Tetrachloroethane	1.00	nd	nd	nd
1,3-Dichlorobenzene	1.00	nd	nd	nd
1,4-Dichlorobenzene	1.00	nd	nd	nd
1,2-Dichlorbenzene	1.00	nd	nd	nd
SURROGATE RECOVERY (%)		89	85	102

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		Method Blank	PNCS -2 S - 1	PNCS -2 S - 2	PNCS -2 S - 3	PC - 1 S - 1	PC - 1 S - 2	PC - 1 S - 3	Dup PC - 1 S - 3
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DATE ANALYZED	MDL	10/9/99	10/9/99	10/9/99	10/9/99	10/9/99	10/9/99	10/9/99	10/9/99
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Total Xylenes	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd	nd	nd
SURROGATE RECOVERY (%)		81	93	108	111	90	112	93	107

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil						Dup	
SAMPLE DESCRIPTION		Method Blank	PH 1 S-1	PH 1 S-2	PH 2 S-1	PH 2 S-1	PH 3 S-1
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	MDL						
DATE ANALYZED		10/10/99	10/10/99	10/10/99	10/10/99	10/10/99	10/10/99
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd	nd	nd
Toluene	0.05	nd	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd	nd
Total Xylenes	0.05	nd	0.72	0.41	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	nd	nd	nd	nd
Chloroform	0.05	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd	0.15	0.23	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	nd	nd	1.60	2.20	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd
SURROGATE RECOVERY (%)		91	107	94	108	109	115

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		SS - 1	SS - 2
	mg/kg	mg/kg	mg/kg
	MDL		
DATE ANALYZED		10/9/99	10/9/99
Vinyl chloride	0.25	nd	nd
Benzene	0.05	nd	nd
Toluene	0.05	0.13	nd
Ethylbenzene	0.05	1.4	nd
Total Xylenes	0.05	11	nd
1,1-Dichloroethene	0.05	nd	nd
Methylene chloride	0.05	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd
1,1-Dichloroethane	0.05	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd
Chloroform	0.05	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd
Carbontetrachloride	0.05	nd	nd
1,2-Dichloroethane	0.05	nd	nd
Trichloroethene (TCE)	0.05	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd
Tetrachloroethene (PCE)	0.05	nd	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd
SURROGATE RECOVERY (%)		102	104

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		Method Bla nk	PC 7 S - 4	PC 7 S - 5
	mg/kg	mg/kg	mg/kg	mg/kg
DATE ANALYZED	MDL	10/15/99	10/15/99	10/15/99
Vinyl chloride	0.25	nd	nd	nd
Benzene	0.05	nd	nd	nd
Toluene	0.05	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd
Total Xylenes	0.05	nd	nd	0.40
1,1-Dichloroethene	0.05	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	nd
Chloroform	0.05	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	0.05	0.07
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd
SURROGATE RECOVERY (%)		88	83	103

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Water.

SAMPLE DESCRIPTION		Method Bla nk	Method Bla nk	JT - 3	JT - 6	JT - 7	JT - 6	JT - 7	Dup JT - 6
	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
DATE ANALYZED	MDL	10/15/99	10/18/99	10/15/99	10/15/99	10/15/99	10/18/99	10/18/99	10/18/99
Vinyl chloride	5.00	nd	nd	nd	24	7.0	41	10	40
Benzene	1.00	nd	nd	29	20	2.7	24	2.1	23
Toluene	1.00	nd	nd	nd	nd	2.0	1.7	nd	1.4
Ethylbenzene	1.00	nd	nd	nd	nd	nd	nd	nd	nd
Total Xylenes	1.00	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	1.00	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	1.00	nd	nd	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	1.00	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	1.00	nd	nd	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	1.00	nd	nd	nd	58	3.0	61	2.1	45
Chloroform	1.00	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	1.00	nd	nd	nd	nd	nd	nd	nd	nd
Carbontetrachloride	1.00	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	1.00	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	1.00	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	1.00	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	1.00	nd	nd	nd	nd	2.9	nd	nd	nd
1,1,1,2-Tetrachloroethane	1.00	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	1.00	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	1.00	nd	nd	15	240	110	250	97	240
1,4-Dichlorobenzene	1.00	nd	nd	8.7	120	93	130	88	130
1,2-Dichlorbenzene	1.00	nd	nd	1.4	19	6.8	9.2	3.3	18
SURROGATE RECOVERY (%)		114	92	102	109	108	102	121	103

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil					Dup
SAMPLE DESCRIPTION		PC 8 S-1	PC 8 S-2	PC 8 S-3	PC 8 S-2
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	MDL				
DATE ANALYZED		10/18/99	10/18/99	10/18/99	10/18/99
Vinyl chloride	0.25	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd
Toluene	0.05	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd
Total Xylenes	0.05	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	nd	nd
Chloroform	0.05	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd
SURROGATE RECOVERY (%)		93	114	75	131

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		Method Blank	PC 8 S-4	PC 8 S-5
	mg/kg	mg/kg	mg/kg	mg/kg
	MDL			
DATE ANALYZED		10/19/99	10/19/99	10/19/99
Vinyl chloride	0.25	nd	nd	nd
Benzene	0.05	nd	nd	nd
Toluene	0.05	nd	1.60	0.37
Ethylbenzene	0.05	nd	nd	nd
Total Xylenes	0.05	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	0.49	nd
Chloroform	0.05	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd
SURROGATE RECOVERY (%)		129	95	97

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		Method Blank	Method Blank	PC 9 S-1	PC 9 S-2	PC 9 S-3	PC 9 S-4	Dup PC 9 S-4
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DATE ANALYZED	MDL	10/20/99	10/21/99	10/20/99	10/21/99	10/21/99	10/21/99	10/21/99
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	0.41	0.23	0.80	1.01
Toluene	0.05	nd	nd	0.09	1.2	0.62	1.9	1.6
Ethylbenzene	0.05	nd	nd	nd	4.9	0.14	0.45	0.35
Total Xylenes	0.05	nd	nd	0.22	29	1.4	3.3	2.7
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	nd	0.05	nd	0.08	0.05
Chloroform	0.05	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd	nd
SURROGATE RECOVERY (%)		70	89	101	83	101	124	113

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		Method Blank	PC 10 S-1	PC 10 S-2	PC 10 S-3	PC 10 S-4	PC 10 S-5
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DATE ANALYZED	MDL	10/22/99	10/21/99	10/20/99	10/21/99	10/22/99	10/22/99
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	0.16	0.07	0.47
Toluene	0.05	nd	nd	nd	0.11	nd	nd
Ethylbenzene	0.05	nd	nd	nd	0.19	nd	nd
Total Xylenes	0.05	nd	1.30	1.20	1.20	nd	0.77
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	0.10	0.12	nd	nd
Chloroform	0.05	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	0.05	1.10	nd	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	0.44	0.83	0.49	0.27	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd
SURROGATE RECOVERY (%)		95	127	123	119	122	89

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil						Dup	
SAMPLE DESCRIPTION		Method Blank	PC11 S - 1	PC11 S - 2	PC11 S - 3	PC11 S - 3	PC12 S - 1
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	MDL						
DATE ANALYZED		10/25/99	10/25/99	10/25/99	10/25/99	10/25/99	10/25/99
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd	nd	nd
Toluene	0.05	nd	nd	nd	nd	nd	0.10
Ethylbenzene	0.05	nd	nd	nd	nd	nd	nd
Total Xylenes	0.05	nd	0.14	0.10	0.24	0.28	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	0.21	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	0.11	0.18	0.11	0.15	nd
Chloroform	0.05	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	0.15	0.34	0.21	0.22	0.32
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	1.30	1.30	1.10	1.20	1.70
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd
SURROGATE RECOVERY (%)		108	83	84	77	95	91

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORHTWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser, Inc.

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		PC12 S - 2	PC12 S - 3	PC12 S - 4	PC12 S - 5
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	MDL				
DATE ANALYZED		10/25/99	10/25/99	10/25/99	10/25/99
Vinyl chloride	0.25	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd
Toluene	0.05	nd	0.14	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd
Total Xylenes	0.05	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	0.67	0.07	0.06	0.40
Chloroform	0.05	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd
Carbontetrachloride	0.05	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	1.50	0.21	0.19	1.40
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	2.30	1.50	2.80	7.00
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd
SURROGATE RECOVERY (%)		81	67	124	81

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee

QA/QC Data - EPA 8021B Analyses

Sample Description: PC - 1 S-3							
	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	(%)
Benzene	10.00	11.55	116	10.00	10.30	103	11.44
Toluene	10.00	12.20	122	10.00	10.40	104	15.93
cis-1,2-Dichloroethene	10.00	10.60	106	10.00	10.60	106	0.00
Trichloroethene (TCE)	10.00	10.30	103	10.00	9.40	94	9.14
Surrogate Spike			112			100	11.32

	Laboratory Control Sample		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Benzene	10.00	9.80	98
Toluene	10.00	10.60	106
cis-1,2-Dichloroethene	10.00	10.60	106
Trichloroethene (TCE)	10.00	10.20	102
Surrogate Spike			86

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 80%-120%
ACCEPTABLE RPD IS 20%
ANALYSES PERFORMED BY: Michael Dee

QA/QC Data - EPA 8021B Analyses

Sample Description: PC - 6 S-3							
	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	(%)
Benzene	1.00	1.15	115	1.00	1.16	116	0.87
Toluene	1.00	1.12	112	1.00	1.40	140	22.22
cis-1,2-Dichloroethene	1.00	1.08	108	1.00	1.14	114	5.41
Trichloroethene (TCE)	1.00	1.16	116	1.00	1.11	111	4.41
Surrogate Spike			102			105	2.90

	Laboratory Control Sample		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Benzene	1.00	1.03	103
Toluene	1.00	1.05	105
cis-1,2-Dichloroethene	1.00	1.02	102
Trichloroethene (TCE)	1.00	1.08	108
Surrogate Spike			95

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 80%-120%
ACCEPTABLE RPD IS 20%
ANALYSES PERFORMED BY: Michael Dee

QA/QC Data - EPA 8021B Analyses

Sample Description: PC - 11 S-3							
	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	(%)
Benzene	1.00	1.02	102	1.00	1.04	104	1.94
Toluene	1.00	1.15	115	1.00	1.16	116	0.87
cis-1,2-Dichloroethene	1.00	1.03	103	1.00	1.04	104	0.97
Trichloroethene (TCE)	1.00	1.17	117	1.00	1.14	114	2.60
Surrogate Spike			98			117	17.67

	Laboratory Control Sample		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Benzene	1.00	0.81	81
Toluene	1.00	1.00	100
cis-1,2-Dichloroethene	1.00	0.88	88
Trichloroethene (TCE)	1.00	0.98	98
Surrogate Spike			118

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 80%-120%
ACCEPTABLE RPD IS 20%
ANALYSES PERFORMED BY: Michael Dee

QA/QC Data - EPA 8021B Analyses

Sample Description: JT - 5							
	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (ug/l)	Measured Conc. (ug/l)	Spike Recovery (%)	Spiked Conc. (ug/l)	Measured Conc. (ug/l)	Spike Recovery (%)	(%)
Benzene	10.00	9.90	99	10.00	10.40	104	4.93
Toluene	10.00	9.70	97	10.00	10.10	101	4.04
cis-1,2-Dichloroethene	10.00	9.60	96	10.00	11.40	114	17.14
Trichloroethene (TCE)	10.00	10.60	106	10.00	12.70	127	18.03
Surrogate Spike			10.1			9.5	6.12

	Laboratory Control Sample		
	Spiked Conc. (ug/l)	Measured Conc. (ug/l)	Spike Recovery (%)
Benzene	1.00	0.99	99
Toluene	1.00	0.96	96
cis-1,2-Dichloroethene	1.00	1.11	111
Trichloroethene (TCE)	1.00	0.94	94
Surrogate Spike			103

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 80%-120%
ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

JACOBSON TERMINAL PROJECT
Ballard, Washington
Hart Crowser, Inc.

Heavy Metals in Soil by EPA-7000 Series

Sample Number	Date Analyzed	Lead (Pb) EPA 7420 (mg/kg)	Cadmium (Cd) EPA 7130 (mg/kg)	Chromium (Cr) EPA 7190 (mg/kg)	Arsenic (As) EPA 7061 (mg/kg)	Copper (Cu) EPA7210 (mg/kg)	Zinc (Zn) EPA 7950 (mg/kg)	Nickel (Ni) EPA 7520 (mg/kg)
Method Blank	10/12/99	nd	nd	nd	nd	nd	nd	nd
PC-1 S1-S3 COMP	10/12/99	8	nd	24	nd	20	37	23
PC-2 S1-S5 COMP	10/12/99	35	nd	nd	nd	14	53	22
PC-3 S1-S3 COMP	10/12/99	nd	nd	26	nd	10	nd	13
PC-4 S1-S3 COMP	10/12/99	nd	nd	nd	nd	9	nd	29
PC-4 S1-S3 COMP Dup	10/12/99	nd	nd	nd	nd	9	nd	26
PNCS2 S1-S3	10/12/99	60	nd	26	nd	40	119	36
SP1 S1-S3	10/12/99	nd	nd	nd	nd	15	21	36
Method Detection Limits		5	1	20	10	5	20	5

"nd" Indicates not detected at listed detection limits.

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

JACOBSON TERMINAL PROJECT
Ballard, Washington
Hart Crowser, Inc.

QA/QC Data - Total Metals EPA-7000 Series Analyses

Sample Number: SP1 S1-S3							
	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	(%)
Lead	250	246	98	250	251	100	2.0
Cadmium	25	24	96	25	24	96	0.0
Chromium	250	239	96	250	231	92	3.4
Arsenic	250	269	108	250	295	118	9.2

	Laboratory Control Sample		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Lead	250	223	89
Cadmium	25	24	96
Chromium	250	250	100
Arsenic	250	259	104

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 65%-135%
ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser
Client Project #4063-10

Heavy Metals in Soil by EPA-7000 Series

Sample Number	Date Analyzed	Lead (Pb) EPA 7420 (mg/kg)	Cadmium (Cd) EPA 7130 (mg/kg)	Chromium (Cr) EPA 7190 (mg/kg)	Arsenic (As) EPA 7061 (mg/kg)	Zinc (Zn) EPA 7950 (mg/kg)	Nickel (Ni) EPA 7520 (mg/kg)	Copper (Cu) EPA 7210 (mg/kg)
Method Blank	10/18/99	nd	nd	nd	nd	nd	nd	nd
PC 6 S1-S5	10/18/99	nd	nd	nd	nd	nd	nd	nd
PC 6 S1-S5 Dup.	10/18/99	nd	nd	nd	nd	nd	nd	nd
PC 7 S1-S5	10/18/99	nd	nd	nd	nd	26	nd	nd
Method Detection Limits		5	1	20	20	20	20	5

"nd" Indicates not detected at listed detection limits.

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser
Client Project #4063-10

QA/QC Data - Total Metals EPA-7000 Series Analyses

Sample Number: 991018-1 E							
	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	(%)
Lead	250	258	103	250	224	90	14.11
Cadmium	25	30	120	25	29	116	3.39
Chromium	125	120	96	125	139	111	14.67
Arsenic	63	67	106	63	68	108	1.48

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser
Client Project #4063-10

	Laboratory Control Sample		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Lead	250	271	108
Cadmium	25	26	104
Chromium	125	150	120
Arsenic	63	64	102

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 65%-135%
ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser
Client Project #4063-10

Heavy Metals in Soil by EPA-7000 Series

Sample Number	Date Analyzed	Lead (Pb) EPA 7420 (mg/kg)	Cadmium (Cd) EPA 7130 (mg/kg)	Chromium (Cr) EPA 7190 (mg/kg)	Arsenic (As) EPA 7061 (mg/kg)	Zinc (Zn) EPA 7950 (mg/kg)	Nickel (Ni) EPA 7520 (mg/kg)	Copper (Cu) EPA 7210 (mg/kg)
Method Blank	10/28/99	nd	nd	nd	nd	nd	nd	nd
PC 8 Comp	10/28/99	nd	nd	26	nd	69	33	34
PC 9 Comp	10/28/99	11.0	nd	nd	nd	102	nd	16
PC 10 Comp	10/28/99	nd	nd	nd	nd	83	nd	11
PC 11 Comp	10/28/99	nd	nd	nd	nd	79	nd	28
PC 12 Comp	10/28/99	7.7	nd	22	nd	72	28	84
PC 12 Comp Dup	10/28/99	8.8	nd	28	nd	74	30	104
Method Detection Limits		5	1	20	20	20	20	5

"nd" Indicates not detected at listed detection limits.

ANALYSES PERFORMED BY: Michael Dee

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

JACOBSON TERMINAL PROJECT
Seattle, Washington
Hart Crowser
Client Project #4063-10

QA/QC Data - Total Metals EPA-7000 Series Analyses

Sample Number:							
	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	(%)
Lead	250	218	87	250	246	98	12.07
Cadmium	25	28	112	25	28	112	0.00
Chromium	25	23	92	25	29	116	23.08
Arsenic	62	55	89	62	59	95	7.02

	Laboratory Control Sample		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Lead	250	274	110
Cadmium	25	27	108
Chromium	25	25	100
Arsenic	62	62	100

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 65%-135%
ACCEPTABLE RPD IS 20%

DATA REVIEWED BY: Sherry Chilcutt

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Hart Crowser

ADDRESS:

PHONE: FAX:

CLIENT PROJECT #: PROJECT MANAGER:

DATE: 10/07/95 PAGE OF

PROJECT NAME:

LOCATION: Ballard Locks / Jacobson

COLLECTOR: DATE OF COLLECTION

Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (gasoline)	TPH (8015 (diesel)	TPH 8015 (g & d)	PAH 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TOTAL LEAD	pH	ASBESTOS	8021B	FIELD NOTES	Total Number of Containers	Laboratory Note Number
Sp1 S-1		1745	Soil	2oz Jar																X		2	
Sp1 S-2		1750	Soil	"																X		2	
Sp1 S-3		1755	Soil	"																X		2	

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
		[signature]	
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Hart Crowser

ADDRESS:

PHONE: FAX:

CLIENT PROJECT #: 4063 - 10 PROJECT MANAGER:

DATE: 10/5/95 PAGE 1 OF 1

PROJECT NAME: Jacobson - Iron Wall

LOCATION: Ballard

COLLECTOR: Dick Ormerod DATE OF COLLECTION 10/5

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NOTES	Total Number of Containers	Laboratory Note Number
1. PNCS-2 S-1		0900	Soil	40z	X															
2. PNCS-2 S-2		0905			X															
3. PNCS-2 S-3		0910			X															
4. PC-1 S-1		0945			X															
5. PC-1 S-2		0950			X															
6. PC-1 S-3		0955			X															
7. SS-1					X															
8. SS-2					X															
9. T-1			Wtr		X															
10. PH-1 S-1			Soil		X															
11. PH-1 S-2					X															
12. PH-2 S-1					X															
13. PH-3 S-1					X															
14.																				
15.																				
16.																				
17.																				
18.																				

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[signature]	10/5/95	[signature]	10/9/95
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☒ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

teg

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Jacobson / Hart Crowser

ADDRESS:

PHONE: FAX:

CLIENT PROJECT #: PROJECT MANAGER:

DATE: 10-12-99 PAGE OF

PROJECT NAME: Jacobson

LOCATION: Seattle

COLLECTOR: DATE OF COLLECTION

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH								NOTES	Total Number of Containers	Laboratory Note Number
1. PC-5 S-1					X																				1		
2. PC-5 S-2					X																				1		
3.																											
4.																											
5.																											
6.																											
7.																											
8.																											
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		M. McGR	10/12/99
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Jacobson / Hart Crowser

ADDRESS:

PHONE FAX:

CLIENT PROJECT #: ~~4063-10~~ PROJECT MANAGER:

DATE: 10-14-99 PAGE OF

PROJECT NAME: Jacobson

LOCATION: Seattle, WA

COLLECTOR: DATE OF COLLECTION

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: ~~VOA 624/8240~~ SOIL/B	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (gasoline)	TPH (8015 (diesel)	TPH 8015 (g & d)	PAH 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TOTAL LEAD	pH	ASBESTOS	As, Cd, Cr, Cu, Pb, Ni, Zn	FIELD NOTES	Total Number of Containers	Laboratory Note Number
PC-6 S-1			Soil		X																	1	
PC-6 S-2			↓		X																	1	
PC-6 S-3			↓		X																	1	
PC-6 S-1→S-3			↓																X		Composite	1	
JT-6			H_2O		X																] Analyze for	2	
JT-7			↓		X																chloro-dichloro benzenes	2	
PC-7 S-1			Soil		X																	1	
PC-7 S-2			↓																X		Composite	1	
PC-7 S-3			↓																				
PC-7 S-1→S-3			↓																				

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		M. Nelson	10/14/99
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Jacobson / Hart Crowser

ADDRESS:

PHONE: FAX:

CLIENT PROJECT #: PROJECT MANAGER:

DATE: 10-15-99 PAGE OF

PROJECT NAME: Jacobson

LOCATION: Seattle, WA

COLLECTOR: JJP DATE OF COLLECTION

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	As, Cd, Cr, Cu, Pb, Ni, Zn	NOTES	Total Number of Containers	Laboratory Note Number
1. PC-7 S-4					X															1	
2. PC-7 S-5					X															1	
3. PC-7 S-1 & S-5																	X		Composite. Don't run S-1 & S-3 Composite.	1	
4.																					
5.																					
6.																					
7.																					
8.																					
9.																					
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		MGDan	10/15/99
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Jacobson / Hart Crowser

ADDRESS:

PHONE: FAX:

CLIENT PROJECT #: PROJECT MANAGER:

DATE: 10-18-99 PAGE OF

PROJECT NAME: Jacobson

LOCATION: Seattle, WA

COLLECTOR: DATE OF COLLECTION

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NOTES	Total Number of Containers	Laboratory Note Number
1. PC-8 S-1		12:30	SOIL		X														1	
2. PC-8 S-2			↓		X														1	
3. PC-8 S-3		16:30	↓		X														1	
4. JT-6			H_2O		X													] w/chloro-dichloro-	2	
5. JT-7			↓		X													benzenes	2	
6.																				
7.																				
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		McRae	10-18-99
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

teg

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Jacobson / Hart Crowser

ADDRESS:

PHONE: FAX:

CLIENT PROJECT #: PROJECT MANAGER:

DATE: 10-19-99 PAGE OF

PROJECT NAME: Jacobson

LOCATION: Seattle, WA

COLLECTOR: JJP DATE OF COLLECTION

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	As, Cd, Cr, Cu, Pb, Ni, Zn	NOTES	Total Number of Containers	Laboratory Note Number
1. PC-8 S-4			SOIL		X															1	
2. PC-8 S-5			↓		X															1	
3. PC-8 S-1 → S-5			↓														X		composite	1	
4.																					
5.																					
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		Michael G Rz	10-19-99
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Hart Crowser

ADDRESS:

PHONE: FAX:

CLIENT PROJECT #: 4063-10 PROJECT MANAGER: Doug Hillman

DATE: 10/21/99 PAGE 1 OF

PROJECT NAME: Jackson Terminals

LOCATION: Ballard, WA

COLLECTOR: Derek Ormerod DATE OF COLLECTION 10/21

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B; VOA 8021B BTEX; VOA 8260; SEMI VOL 8270; TPH - HCID; TPH 8015 (gasoline); TPH 8015 (diesel); TPH 8015 (d & o); PAH 8100; PCBs 8082; Pesticides 8081; TOTAL LEAD; pH	NOTES	Total Number of Containers	Laboratory Note Number
1. PC-9 S-2			Soil	4oz	X			
2. PC-9 S-3			↓	↓	X			
3. PC-9 S-4					X			
4. PC-10 S-1	1450				X			
5. PC-10 S-2	1455				X			
6. PC-10 S-3	1500				X			
7. PC-10 S-4	1505				X			
8. PC-10 S-5	1510		↓	↓	X			
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
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RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
DO	10/21/99	Michelle	10/21/99
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Hart Crowser

ADDRESS:

PHONE: FAX:

CLIENT PROJECT #: 7188 PROJECT MANAGER: Doug Hillman

DATE: 10/25/95 PAGE 1 OF 1

PROJECT NAME: Jackson - Iron Wall

LOCATION: Ballard

COLLECTOR: Derek Ormond DATE OF COLLECTION 10/25

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B (circled)	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NOTES	Total Number of Containers	Laboratory Note Number
1. PC-11 S-1		0930	soil	402	X															
2. PC-11 S-2		0935			X															
3. PC-11 S-3		0940			X															
4. PC-12 S-1		1520			X															
5. PC-12 S-2		1525			X															
6. PC-12 S-3		1530			X															
7. PC-12 S-4		1535			X															
8. PC-12 S-5		1540			X															
9.																				
10.																				
11.																				
12.																				
13.																				
14.																				
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D. Ormond	10/25/95	M. McCor	10/25
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Jacobson / Hart Crowser

ADDRESS: 300 Admiral Way Suite 209 Edmonds 98020

PHONE: (425) 744-9765 FAX:

CLIENT PROJECT #: PROJECT MANAGER:

DATE: 10/11/99 PAGE OF

PROJECT NAME: Jacobson Terminal

LOCATION: Seattle, Washington

COLLECTOR: DATE OF COLLECTION 10/11

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	Ar Cd Cr Cu Ni Pb Zn	NOTES	Total Number of Containers	Laboratory Note Number
1. PC-2 S-1					X															1	
2. PC-2 S-2					X															1	
3. PC-2 S-3					X															1	
4. PC-2 S-4					X															1	
5. PC-2 S-5					X															1	
6. PC-2 S1→S5																	X		Composite	1	
7. PC-1 S1→S3																	X		Composite	1	
8. PNCS2 S1→S3																	X		Composite	1	
9. SP1 S1→S3																	X		Composite	1	
10. PC-3 S-1					X															1	
11. PC-3 S-2					X															1	
12. PC-3 S-3					X															1	
13. PC-3 S1→S3																	X		Composite	1	
14.																					
15.																					
16.																					
17.																					
18.																					

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:
8021 B Analyses done in Field

Turn Around Time:

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Jacobson / Hart Crowser

ADDRESS: 300 Admiral Way Suite 209 Edmonds 98020

PHONE: (425) 744-9765 FAX: _____

CLIENT PROJECT #: _____ PROJECT MANAGER: _____

DATE: 10/12/99 PAGE _____ OF _____

PROJECT NAME: Jacobson Terminal

LOCATION: Seattle, WA

COLLECTOR: _____ DATE OF COLLECTION _____

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	As, Cd, Cr, Cu, Ni, Pb, Zn	NOTES	Total Number of Containers	Laboratory Note Number
1. PC SP-4 S-1					X															1	
2. PC SP-4 S-2					X															1	
3. PC SP-4 S-3					X															1	
4. PC SP-4 S-1→S-3																	X		Composite	1	
5.																					
6.																					
7.																					
8.																					
9.																					
10.																					
11.																					
12.																					
13.																					
14.																					
15.																					
16.																					
17.																					
18.																					

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Jacobson / Hartcrowser

ADDRESS:

PHONE: (206) 324-9530 FAX:

CLIENT PROJECT #: 4063-10 PROJECT MANAGER: Doug Hillman

DATE: 10·14·99 PAGE OF

PROJECT NAME: Jacobson Terminal PJCT.

LOCATION: Seattle, WA

COLLECTOR: DATE OF COLLECTION 10/14

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH/HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	Zn, Pb, Cd, Cr, As *	NOTES	Total Number of Containers	Laboratory Note Number
1. PC 6 S1→S3			Soil	4oz Jar														X	Please Composite	3	
2. PC 7 S1→S5			Soil	4oz Jar														X	Please Composite	5	
3.																					
4.																					
5.																					
6.																					
7.																					
8.																					
9.																					
10.																					
11.																					
12.																					
13.																					
14.																					
15.																					
16.																					
17.																					
18.																					

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

* Same Metals as before

24 Hr TAT

Turn Around Time:

APPENDIX D
WASTE DISPOSAL DOCUMENTATION
IMPORTED FILL SCALE TICKETS

Certification No. 99-1160
Billing Acct. No. 12331
Product Code. 66

BILL OF LADING
CONTAMINATED SOIL

REGIONAL DISPOSAL COMPANY
200 - 112th Avenue NE, Suite 300
Bellevue, WA 98004
Telephone: (206) 646-2400 / Fax: (206) 646-2440

This Bill of Lading augments the Master Service Agreement ("Agreement") entered into by REM TECH ("Customer") and Regional Disposal Company ("RDC") on 10/22/99 (date). The terms herein are made a part of the Agreement. In the event of conflict between this Bill of Lading and the Agreement, the terms of the Agreement prevail.

RDC hereby authorizes the Wastes ("Waste") described in Certification No. 99-1160, signed by Customer on 10/22/99 (date), for disposal at Roosevelt Regional Landfill. Customer shall present a copy of this Bill of Lading with each shipment delivered.

Location of Waste: 5335 NW MARKET STREET, SEATTLE

Method of Shipment: SELF HAUL

Additional Fees (e.g., laboratory fees, transportation fees, special handling fees, etc. If none, so state):

NONE

PERFORMANCE DATE

FOR RDC TRANSPORTATION: Customer shall make the Waste available for shipment no later than _____ (date). RDC shall transport the Waste no later than _____ (date), unless RDC notifies the Customer in writing that Waste transport shall be suspended or canceled due to RDC's exercise of its right to inspect or analyze the Waste (as provided in the Agreement).

FOR CUSTOMER TRANSPORTATION: Customer shall begin delivery of the Waste at [*check one*]:

☐ Roosevelt Regional Landfill. ☒ Seattle Transfer Station located at Third and Lander.

Waste delivery shall begin no later than 10/22/99 (date), and shall complete delivery of the Waste no later than 10/22/00 (date), unless RDC notifies Customer in writing to suspend or cancel the waste delivery due to RDC's exercise of its right to inspect or analyze the Waste (As provided in the Agreement).

CUSTOMER	REGIONAL DISPOSAL COMPANY
X M. L. Henry Signature	Leslie Whiteman Signature
X Mark Henry - Project Manager REMTECH, inc Printed Name and Title	Leslie Whiteman - Sales Coordinator Printed Name and Title
X October 22, 1999. Date	10/22/99 Date

ALL TRUCKS MUST HAVE A COPY OF THIS BILL OF LADING WHEN DELIVERING WASTE TO THE TRANSFER STATION OR TO THE LANDFILL.

Revised: 1/26/96

****
*** TX REPORT ***
****

TRANSMISSION OK

TX/RX NO	0037
CONNECTION TEL	4256462508
SUB-ADDRESS	
CONNECTION ID	
ST. TIME	10/22 08:44
USAGE T	01'23
PGS.	5
RESULT	OK

OCT-22-1999 08:14 REMTECH, INC 253 537 5003 P.02

Sent By: [illegible];

Norman Peck - [illegible]
425-649-7047

RABANCO

200 112th Ave. N.E., Suite 380
Bellevue, Washington 98004

Leslie Whiteman

[redacted]

TO:

To: Mark Date: 10/22/99

Company: Rem Tech From: Leslie Whiteman

Telp: 253 537 4559 Telp: (425) 646-2505

Fax: 253 537 5003 Fax: (425) 646-2508

Sending: 5 Pages (including cover)

Contact Derek Ormerod
206 793-7428

___ Please complete, sign and return for my signature
___ Your final copies
X Per your request
___ Other

Message:

GENERATOR WASTE PROFILE SHEET

Requested Disposal Facility: Rabanco

an Allied Waste Company

Waste Profile #

Date: 10/22/99

I. GENERATOR INFORMATION

Generator Name: A & B Jacobson			
Generator Site Address: 5335 NW Market St.			
City: Seattle	County: King	State: WA	Zip: 98107
Generator State ID No:		SIC Code No:	
Generator Mailing Address (if different): 300 Admiral Way Suite 209			
City: Edmonds	County: Snohomish	State: WA	Zip: 98020
Generator Contact Name: Al Jacobson			
Phone Number: 425-744-9765	Fax Number: 425-744-2791		

II. TRANSPORTER INFORMATION

Transporter Name: Al Dreibaum & Son			
Transporter Address: 31108 3rd Ave Suite 422			
City: Black Diamond	County: Pierce	State: WA	Zip: 98010
Transporter Contact Name: Al Dreibaum			
Phone Number: 206-510-2839	Fax Number: 360-886-2609	State Transportation #: 14/A (G/C)	

III. WASTE STREAM INFORMATION

Name of Waste: Soil

Process Generating Waste: Excavation

Type of waste: INDUSTRIAL PROCESS WASTE or ~~POLLUTION CONTROL WASTE~~

Physical State: (SOLID) SEMI-SOLID POWDER LIQUID OTHER:

Method of Shipment: (BULK) DRUM BAGGED OTHER / EXPLAIN:

Estimated Annual Volume: CUBIC YARDS: ~200 TONS: OTHER:

Frequency: ONE TIME ONLY DAILY WEEKLY MONTHLY (OTHER / EXPLAIN: As site requires removal (2-3x)

SPECIAL HANDLING INSTRUCTIONS:

IV. REPRESENTATIVE SAMPLE CERTIFICATION

Is the representative sample collected to prepare this profile and laboratory analysis, collected in accordance with U.S. EPA § 40 CFR 261.20(c) guidelines or equivalent rules?		(YES) or NO
Sample Date: 10/20/99	Circle one: COMPOSITE SAMPLE	(GRAB SAMPLE) (5)
Sampler's Employer: Hart Crowser		
Sampler's Name (printed): Derek Comeroal	Signature:	

Waste Profile # _____

V. PHYSICAL CHARACTERISTICS OF WASTE

CHARACTERISTIC COMPONENTS	% BY WEIGHT (range)
1. Soils	80-90%
2. Moisture	10 - 20%
3.	

Color	Odor (describe):	Free Liquids: YES or NO Content_____%	% Solids:	pH:	Flash Point:	Phenol
brown & gray	none		80-90%		_____°F	_____ppm

Attach Laboratory Analytical Report (and/or Material Safety Data Sheet) Including Required Parameters Provided for this Profile.

Does this waste or generating process contain regulated concentrations of the following Pesticides and/or Herbicides: Chlordane, Endrin, Heptachlor (and its epoxides), Lindane, Methoxychlor, Toxaphene, 2, 4-D, 2, 4, 5, -TP Silvex as defined in § 40 CFR 261.33?	YES or NO
Does this waste or the generating process cause it to exceed OSHA exposure limits from high levels of Hydrogen Sulfide or Hydrogen Cyanide as defined in § 40 CFR 261.23?	YES or NO
Does this waste contain regulated concentrations of Polychlorinated Biphenyls (PCBs) as defined in § 40 CFR Part 761?	YES or NO
Does this waste contain regulated concentrations of listed hazardous wastes defined by § 40 CFR 261.31, 261.32, 261.33, including RCRA F-Listed Solvents?	YES or NO
Does this waste contain regulated concentrations of 2, 3, 7, 8-Tetrachlorodibenzodioxin (2, 3, 7, 8-TCCD), or any other dioxin as defined in § 40 CFR 261.31?	YES or NO
Is this a regulated Toxic Material as defined by Federal and/or State regulations?	YES or NO
Is this a regulated Radioactive Waste as defined by Federal and/or State regulations?	YES or NO
Is this a regulated Medical or Infectious Waste as defined by Federal and/or State regulations?	YES or NO
Is this waste generated at a Federal Superfund Clean Up Site?	YES or NO

VI. GENERATOR CERTIFICATION

I hereby certify that to the best of my knowledge and belief, the information contained herein is a true and accurate description of the waste material being offered for disposal. I further certify that by utilizing this profile, neither myself nor any other employee of the company will deliver for disposal or attempt to deliver for disposal any waste which is classified as toxic waste, hazardous waste, medical or infectious waste, or any other waste material this facility is prohibited from accepting by law. Our company hereby agrees to fully indemnify this disposal facility against any damages resulting from this certification being inaccurate or untrue.

Scott Jacobson Supervisor
AUTHORIZED REPRESENTATIVE NAME AND TITLE (Printed)

A&B Jacobson, LLC
COMPANY NAME

Scott A Jacobson
AUTHORIZED REPRESENTATIVE SIGNATURE

10-22-1999
DATE

GENERATOR WASTE PROFILE SHEET

INSTRUCTIONS FOR THE COMPLETION OF GENERATOR WASTE PROFILE SHEET

PURPOSE

The Generator Waste Profile Sheet is to be completed to properly identify and characterize the type of waste that is requested for acceptance. All information provided and certified by the generator of the waste identified by the Waste Profile Sheet is true, correct, and accurate.

This form is to be used when applying for acceptance approval of a new waste stream or the renewal of an existing waste stream.

WASTE PROFILE SHEET INFORMATION

Waste Profile Number: Leave blank. Company tracking number will be issued by the Compliance & Landfill Development Department of Allied Waste.

Disposal Facility: Enter the name of the proposed landfill facility for the ultimate disposal of the non-hazardous solid waste stream.

I. GENERATOR INFORMATION

Generator Name and Address: Enter the required information including the name, address, telephone number of the company generating the waste stream for disposal. If the address to where correspondence is to be sent is different from the site address, complete the mailing address, otherwise, type "SAME". Also enter the Generator's Contact Person's Name and telephone number.

Generator State ID Number: Applies only if State Agency issues ID Numbers (i.e., Illinois EPA has a ten digit code assigned to each generator of special waste). If the State Agency does not issue a number enter "n/a".

SIC Code Number: Each industry class is assigned a four-digit code called a Standard Industrial Classification Code. The classification is assigned to the process which generates a specific product.

II. TRANSPORTATION INFORMATION

Transporter: Enter general information of the waste hauler who is to transport the waste.

III. WASTE STREAM INFORMATION

Waste Name: Provide the common name of the major component or substance that most accurately describes the waste.

Process Description: Provide a description of the process or operation which generates the waste.

Pollution Control Waste or Industrial Process Waste: Check the one category which applies to the waste stream.

> **Pollution Control Waste** means any waste generated as a direct or indirect result of the removal of contaminants from the air, water, or land, which pose a present or potential threat to human health or to the environment or with the inherent properties which make the disposal of such waste in a landfill difficult to manage by normal means. "Pollution Control Waste" includes, but is not limited to, water and wastewater treatment plant sludge, baghouse dusts, landfill wastes, scrubber sludges, chemical spill cleaning.
>
> **Industrial Process Waste** means any waste generated as a direct or indirect result of the manufacturer of the product or the performance of a service, which would pose a present or potential threat to human health or to the environment or with inherent properties which make the disposal of such waste in a landfill difficult to manage by normal means. "Industrial Process Waste" includes, but is not limited to, spent pickling liquors, cutting oils, chemical catalyst, distillation bottoms, etching acids, equipment cleaning, paint sludge, incinerator ashes (including but not limited to ash resulting from the incineration of potentially infectious medical waste), core sands, metallic dust sweepings, asbestos dust, and off-specification, contaminated or recalled wholesale or retail products. Specifically excluded are uncontaminated packaging material, uncontaminated machinery components, general household waste, landscape waste, and construction and demolition debris.

Physical State: Circle one of the choices listed. Give the most accurate phase of the waste.

Method of Shipment: Circle one of the choices listed. Describe the planned method of transportation to the disposal site.

Estimated Annual Volume: List the estimated annual volume in cubic yards or tons. If other, explain (i.e., drums).

Frequency: Circle one of the choices listed. Approximately how often the disposal of the waste is to occur.

Special Handling Instructions: Indicate any specific instructions.

IV. REPRESENTATIVE SAMPLE CERTIFICATION

Collection of Representative Sample: Indicate "Yes" or "No" that a representative sample was collected to prepare the profile sheet and laboratory analytical report in accordance with the USEPA guideline or equivalent rule. Enter date sample taken. Indicate by circling whether this is a Composite Sample or a Grab Sample. Enter sampler's employer company name. Type or print Sampler's name and also have the sampler sign where indicated.

V. PHYSICAL CHARACTERISTICS OF WASTE:

Characteristic Components: Furnish the general constituents and the relative percentages that comprise the waste. These components can have generic or chemical names. The total percentage must equal 100% (i.e., Petroleum Contaminated Soil: soil . . . 97-100%, gasoline . . . 0-2%, moisture . . . 0-2%).

Color: Describe the color of the waste. If the color is variable, provide the most dominating color.

Odor: If an odor from the waste is detected, give the most accurate description of that odor including what kind of odor and if it is slight, mild, or strong. If no odor is detected, indicate "none".

Free Liquids: Determine if there are free liquids in the waste (Paint Filter Test). Mark "NO" if the waste passes the test (no free liquids present). Mark "YES" if the waste fails the test (detecting the presence of free liquids).

Percent Solids: Determine the amount of solids present in the waste; provide as a percentage of the waste as a whole.

pH: Indicate the pH of the waste (Corrosivity).

Flash Point: Indicate the temperature at which the waste ignites.

Phenol: The EPA limit for Phenol concentration in any non-hazardous special waste is 1,000 total ppm. List the total ppm of phenol present.

Attach Analytical Report

Eight RCRA TCLP Metals, Cyanide Total/Reactive, Sulfide Total/Reactive, Flash Point, Paint Filter, pH, Phenol, PCBs, EOX, TCLP Organics (TCLP Volatiles, TCLP Semi-Volatiles), Pesticides/Herbicides are parameters required to be tested for the majority of waste streams for approval. When performing metals and organics analysis, Total or TCLP procedure may be utilized, but any constituent whose total concentration exceeds the TCLP limit must be analyzed using the TCLP test and result reported.
Where parameters are not tested, include historical background and/or Material Safety Data Sheets.
Analytical used to complete this form MUST be less than one (1) year old.

Pesticides and/or Herbicides: Indicate "Yes" or "No".

Sulfide or Cyanide: Indicate "Yes" or "No".

PCBs: Indicate "Yes" or "No".
PCBs are generally used in electric capacitors, transformers, and vacuum pumps. PCBs are not to be present in non-hazardous solid waste. An alternate name commonly used by laboratories for PCB is "Arochlor" followed by a number defining the special PCB tested. If PCBs are tested and separated into the Arochlor compounds, the highest detection limit is the parameter to be reported.

Non-Hazardous Waste Classification Certification: Indicate "Yes" or "No".

Dioxins: Indicate "Yes" or "No".

Toxic Material: Indicate "Yes" or "No".

Radioactive Waste: Indicate "Yes" or "No".

Medical or Infectious Waste: Indicate "Yes" or "No".

Federal Superfund Site: Indicate "Yes" or "No".

VI. GENERATOR CERTIFICATION

Certification requires generator name, title, date, and signature. If a generator employee does not sign the Waste Profile Sheet, a letter from the generator authorizing the person (Contractor/Hauler) to sign the form on their behalf, must accompany the Waste Profile Sheet.

October 22, 1999

Ms. Leslie Whiteman,

This letter is to assure you that Transglobal Environmental Geosciences Northwest, Inc. is an accredited moble laboratory for the State of Washington.

The following stockpile samples were analyzed by indicated EPA methods.

Sincerely,

Michael Dee
(360) 459 - 4670

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: Hart Crowser

ADDRESS: 1910 Fairview Ave E

PHONE: 206-324-9530 FAX: 206-328 5581

CLIENT PROJECT #: 7188 PROJECT MANAGER:

DATE: 10/13/95 PAGE 1 OF 1

PROJECT NAME: Jacobsen Terminals

LOCATION: Ballard - Seattle WA

COLLECTOR: Derek Ormerod DATE OF COLLECTION 10/18

Sample Number	Depth	Time	Sample Type	Container Type	VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NOTES	Total Number of Containers	Laboratory Note Number
1. PC-8 S-1		1000	Soil	40z	X														1	
2. PC-8 S-2		1015	"	"	X														1	
3. PC-8 S-3		1030	"	"	X														1	
4. PC-8 S-4		1045	"	"	X														1	
5. PC-8 S-5		1100	"	"	X														1	
6.																				
7.																				
8.																				
9.																				
10.																				
11.																				
12.																				
13.																				
14.																				
15.																				
16.																				
17.																				
18.																				

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
[signature]	10/13/95 1115	[signature]	10/13/95
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

SUMMARY OF LOADS HAULED INVOICE #9922778-J

PAGE 1

DATE	TICKET #	GROSS	TARE	NET	NET TONS	TRUCK #	CONTAINER #
Contaminated Soils							
10/22/99	1112759	103,660	39,840	63,820	31.910	A12	
10/22/99	1112760	103,000	37,000	66,000	33.000	2303	
10/22/99	1112762	106,520	39,420	67,100	33.550	2311	
10/23/99	1112877	114,520	40,620	73,900	36.950	2307	
10/23/99	1112882	104,420	40,900	63,520	31.760	A12	
10/23/99	1112887	113,800	36,900	76,900	38.450	2303	
10/23/99	1112902	116,700	40,040	76,660	38.330	2307	
10/23/99	1112910	112,280	40,120	72,160	36.080	12	
10/23/99	1112913	112,840	36,900	75,940	37.970	2303	
10/23/99	1112924	112,040	40,220	71,820	35.910	2307	
10/23/99	1112928	109,400	40,280	69,120	34.560	12	
10/23/99	1112930	110,280	36,820	73,460	36.730	2303	
10/23/99	1112964	107,040	40,280	66,760	33.380	12	
10/23/99	1112994	106,940	39,940	67,000	33.500	12	
				Total:	492.080		

VENDOR # _____

JOB CODE # _____

GL # _____

APPROVED BY: _____

RABANCO RECYCLING CO.
A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112994

DATE: 10/23/99
TIME: 13:14

13331 - REMTECH, INC Job:99-1160
FIRST TEAM
TRUCK #: 12 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	[illegible] LBS	13:05	10/23/99	IN
TARE:	39940 LBS	13:14	10/23/99	OUT

VENDOR # _____
JOB CODE # _____
GL # _____
APPROVED BY: _____

NET LBS:		67000
NET TONS:		33.500
RATE PER TON:	$	0.00
AMOUNT:	$	0.00
REFUSE TAX 3.60%:		0.00
TOTAL AMOUNT:	$	0.00

Recycled

X _____
CUSTOMER SIGNATURE
I HAVE READ AND AGREE TO THE CONDITIONS ON THE REVERSE SIDE.

RABANCO RECYCLING CO.
A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112964

DATE: 10/23/99
TIME: 11:49

13331 - REMTECH, INC Job:99-1160
FIRST TEAM
TRUCK #: 12 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	107040 LBS	11:39	10/23/99	IN
TARE:	[illegible] LBS	11:49	10/23/99	OUT

VE _____
JC _____
G _____
AP _____

NET LBS:		[illegible]
NET TONS:		[illegible]
RATE PER TON:	$	0.00
AMOUNT:	$	0.00
REFUSE TAX 3.60%:		0.00
TOTAL AMOUNT:	$	0.00

X _____
CUSTOMER SIGNATURE
I HAVE READ AND AGREE TO THE CONDITIONS ON THE REVERSE SIDE.

RABANCO RECYCLING CO.
A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112930

DATE: 10/23/99
TIME: 10:41

13331 - REMTECH, INC Job:99-1160
NOR PAC
TRUCK #: 2303 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	110280 LBS	10:29	10/23/99	IN
TARE:	36820 LBS	10:41	10/23/99	OUT

VEN
JOB
GL
APPR

NET LBS:		73460
NET TONS:		36.730
RATE PER TON:	$	0.00
AMOUNT:	$	0.00
REFUSE TAX 3.60%:		0.00
TOTAL AMOUNT:	$	0.00

We X
CUSTOMER SIGNATURE
I HAVE READ AND AGREE TO THE CONDITIONS ON THE REVERSE SIDE.

Recycled

RABANCO RECYCLING CO.
A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112928

DATE: 10/23/99
TIME: 10:32

13331 - REMTECH, INC Job:99-1160
FIRST TEAM
TRUCK #: 12 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	109490 LBS	10:18	10/23/99	IN
TARE:	[illegible]	[illegible]	[illegible]	OUT

VEN
JOB
GL
APPR

NET LBS:		[illegible]
NET TONS:		[illegible]
RATE PER TON:	$	0.00
AMOUNT:	$	[illegible]
REFUSE TAX 3.60%:		[illegible]
TOTAL AMOUNT:	$	[illegible]

X
CUSTOMER SIGNATURE
I HAVE READ AND AGREE TO THE CONDITIONS ON THE REVERSE SIDE.

Recycled

RABANCO RECYCLING CO.

A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112924

DATE: 10/23/99
TIME: 10:02

13331 - REMTECH, INC Job:99-1160
NOR PAC
TRUCK #: 2307 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	112040 LBS	09:52	10/23/99	IN
TARE:	40220 LBS	10:01	10/23/99	OUT

NET LBS: 71820
NET TONS: 35.910
RATE PER TON: $ 0.00

AMOUNT: $ 0.00
REFUSE TAX 3.60%: 0.00

TOTAL AMOUNT: $ 0.00

VENDOR: ______
JOB CODE: ______
GL #: ______

X
CUSTOMER SIGNATURE
I HAVE READ AND AGREE TO THE CONDITIONS ON THE REVERSE SIDE.

Recycled

RABANCO RECYCLING CO.
A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112913

DATE: 10/23/99
TIME: 09:27

13331 - REMTECH, INC Job:99-1160
NOR PAK
TRUCK #: 2303 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	112840 LBS	09:15	10/23/99	IN
TARE:	36900 LBS	09:27	10/23/99	OUT

NET LBS: 75940
NET TONS: 37.970
RATE PER TON: $ 0.00

AMOUNT: $ 0.00
REFUSE TAX 3.60%: 0.00

TOTAL AMOUNT: $ 0.00

VE______
JO______
GL #______
APPR______

X
CUSTOMER SIGNATURE
I HAVE READ AND AGREE TO THE CONDITIONS ON THE REVERSE SIDE.

Recycled

RABANCO RECYCLING CO.
A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112910

DATE: 10/23/99
TIME: 09:09

1112906 wasnt on scale

13331 - REMTECH, INC Job:99-1160
FIRST CLASS
TRUCK #: 12 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	112280 LBS-MAN WT	09:08	10/23/99	IN
TARE:	40120 LBS-MAN WT			OUT

NET LBS: 72160
NET TONS: 36.080
RATE PER TON: $ 0.00

AMOUNT: $ 0.00
REFUSE TAX 3.60%: 0.00

TOTAL AMOUNT: $ 0.00

VENDOR # _____
JOB CODE _____
GL # _____
APPR. _____

X _____
CUSTOMER SIGNATURE
I HAVE READ AND AGREE TO THE CONDITIONS ON THE REVERSE SIDE.

Recycled

RABANCO RECYCLING CO.
A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1113902

DATE: 10/23/99
TIME: 09:53

13331 - REMTECH, INC Job:99-1160
NOR PAC
TRUCK #: 2307 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	[illegible]	08:44	10/23/99	IN
TARE:	40040 LBS	08:53	10/23/99	OUT

NET LBS: 72440
NET TONS: 36.220
RATE PER TON: $ 0.00

AMOUNT: $ 0.00
REFUSE TAX 3.60%: 0.00

TOTAL AMOUNT: $ 0.00

VENDOR # _____
JOB CODE _____
GL # _____
APPR. _____

X _____
CUSTOMER SIGNATURE
I HAVE READ AND AGREE TO THE CONDITIONS ON THE REVERSE SIDE.

Recycled

RABANCO RECYCLING CO.

A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112887

DATE: 10/23/99
TIME: 08:16

13331 - REMTECH, INC Job:99-1160
NOR PAC
TRUCK #: 2303 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	113800 LBS	08:05	10/23/99	IN
TARE:	36900 LBS	08:16	[illegible]	OUT

NET LBS:	76900
NET TONS:	38.450
RATE PER TON: $	0.00
AMOUNT: $	0.00
REFUSE TAX 3.60%:	0.00
TOTAL AMOUNT: $	0.00

VENDOR # ____
JOB CODE ____
GL # ____
APPR. ____

X ____
CUSTOMER SIGNATURE
I HAVE READ AND AGREE TO THE CONDITIONS ON THE REVERSE SIDE.

Recycled

RABANCO RECYCLING CO.

A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112882

DATE: 10/23/99
TIME: 07:57

13331 - REMTECH, INC Job:99-1160
REMTECH
TRUCK #: A12 END DUMP PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	104420 LBS	07:49	10/23/99	IN
[illegible]	[illegible]	07:57	10/23/99	OUT

NET LBS:	[illegible]
NET TONS:	[illegible]
RATE PER TON:	[illegible]
AMOUNT: $	[illegible]
REFUSE TAX 3.60%:	[illegible]
TOTAL AMOUNT:	[illegible]

VENDOR # ____
JOB CODE ____
GL # ____
APPR. ____

X ____
CUSTOMER SIGNATURE

Recycled

DEC-09-1999 09:22 REMTECH INC

RABANCO RECYCLING CO.

A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112877 DATE: 10/23/99
TIME: 07:43

13331 - REMTECH, INC Job:99-1160
REMTECH - NORPAC
TRUCK #: 2307 END DUMP PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	114520 LBS	07:30	10/23/99	IN
TARE:	40620 LBS	07:43	10/23/99	OUT

NET LBS:		73900
NET TONS:		36.950
RATE PER TON:	$	0.00
AMOUNT:	$	0.00
REFUSE TAX 3.60%:		0.00
TOTAL AMOUNT:	$	0.00

VENDOR #
JOB CODE
GL #
APPROVED BY X

CUSTOMER SIGNATURE
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Recycled

RABANCO RECYCLING CO.

A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112762 DATE: 10/22/99
TIME: 15:45

13331 - REMTECH, INC Job:99-1160
NOR-PAC
TRUCK #: 2311 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	106520 LBS	15:12	10/22/99	IN
TARE:	39420 LBS	15:45	10/22/99	OUT

NET LBS:		67100
NET TONS:		33.550
RATE PER TON:	$	0.00
AMOUNT:	$	0.00
REFUSE TAX 3.60%:		0.00
TOTAL AMOUNT:	$	0.00

VENDOR #
JOB CODE
GL #
APPROVED BY X

CUSTOMER SIGNATURE

RABANCO RECYCLING CO.
A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112759

DATE: 10/22/99
TIME: 16:19

13331 - REMTECH, INC Job:99-1160
REM TECH
TRUCK #: A12 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	103680 LBS	16:07	10/22/99	IN
TARE:	39840 LBS	16:19	10/22/99	OUT

NET LBS:		63820
NET TONS:		31.910
RATE PER TON:	$	0.00
AMOUNT:	$	0.00
REFUSE TAX 3.60%:		0.00
TOTAL AMOUNT:	$	0.00

VENDOR: _____
JOB CODE: _____
GL #: _____
APPROVED BY: _____

X _____
CUSTOMER SIGNATURE
I HAVE READ AND AGREE TO THE CONDITIONS ON THE REVERSE SIDE.

Recycled

RABANCO RECYCLING CO.
A DIVISION OF RABANCO COMPANIES
2733 3rd Avenue South
Seattle, Washington 98134
(206) 623-4080

TICKET NUMBER 1112760

DATE: 10/22/99
TIME: 16:20

13331 - REMTECH, INC Job:99-1160
NOR-PAC
TRUCK #: 8300 DUMP TRUCK PLACE: A SEATTLE
PRODUCT: CONTAMINATED SOILS

	WEIGHT	TIME	DATE	SCALE
GROSS:	103000 LBS	16:00	10/22/99	IN
TARE:	37820 LBS	16:20	10/22/99	OUT

NET LBS:		65180
NET TONS:		32.590
RATE PER TON:	$	0.00
AMOUNT:	$	0.00
REFUSE TAX 3.60%:		0.00
TOTAL AMOUNT:	$	0.00

VENDOR: _____
JOB CODE: _____
GL #: _____
APPROVED BY: _____

X _____

LAKESIDE INDUSTRIES

SEATTLE DIVISION

P.O. BOX 7 BELLEVUE, WA 98009

(206) 632-2709

DATE	LOAD TIME	TICKET NO.
10/27/99	06:57	48929

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
1325		CK 2577

SOLD TO

CASH SALES
SEATTLE

DELIVERED TO

JOB ID:

99-0035

ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8"- 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
1	

REMARKS

Subtotal
Freight
Tax

PLANT: PLNT# 31 ST SEAL# 89

WEIGHMASTER: D. Billerbeck Total

M.P. OR STATION		WEIGHTS		
			GROSS	27.05 TON
STREET INSP.	TIME RECEIVED		TARE	12.15 TON
			NET	14.90 TON
			NET TONS	13.52 Metric Tons

RECEIVED BY	LOADS TODAY	TONS TODAY
J. Kuhl		

AN EQUAL OPPORTUNITY EMPLOYER

WA. ST. CONT. REG. NO. 223-01 LA-KE-SI*-274JD

LAKESIDE INDUSTRIES

SEATTLE DIVISION

P.O. BOX 7 BELLEVUE, WA 98009

(206) 632-2709

DATE	LOAD TIME	TICKET NO.
10/27/99	07:47	48941

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
1325		CK 2577

SOLD TO	DELIVERED TO
CASH SALES SEATTLE	JOB ID: 99-0035 ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8"- 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
1	

REMARKS

Subtotal
Freight
Tax

PLANT: PLNT# 31 ST SEAL# 89
WEIGHMASTER: D. Billerbeck

Total

M.P. OR STATION		WEIGHTS		
			GROSS	27.10 TON
			TARE	12.15 TON
STREET INSP.	TIME RECEIVED		NET	14.95 TON
			NET TONS	13.56 Metric Ton

RECEIVED BY	LOADS TODAY	TONS TODAY

AN EQUAL OPPORTUNITY EMPLOYER

WA. ST. CONT. REG. NO. 223-01 LAKE-SI*274 ID

LAKESIDE INDUSTRIES

SEATTLE DIVISION

P.O. BOX 7 BELLEVUE, WA 98009

(206) 632-2709

DATE	LOAD TIME	TICKET NO.
10/27/99	09:22	48962

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
1325		CK 2577

SOLD TO	DELIVERED TO
CASH SALES SEATTLE	JOB ID: 97 0035 ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8"- 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
1	

REMARKS

Subtotal
Freight
Tax

PLANT: PLNT# 31 ST SEAL# 89
WEIGHMASTER: D. Billerbeck Total

M.P. OR STATION		WEIGHTS		
			GROSS	28.23 TON
			TARE	12.15 TON
STREET INSP.	TIME RECEIVED		NET	16.08 TON
			NET TONS	14.59 Metric Ton

RECEIVED BY	LOADS TODAY	TONS TODAY

AN EQUAL OPPORTUNITY EMPLOYER

WA. ST. CONT. REG. NO. 223-01 LA-KE-SI*-274JD

LAKESIDE INDUSTRIES

SEATTLE DIVISION

P.O. BOX 7

BELLEVUE, WA 98009

(206) 632-2709

DATE	LOAD TIME	TICKET NO.
10/27/99	10:27	48979

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
1325		CK 2577

SOLD TO

CASH SALES
SEATTLE

DELIVERED TO

JOB ID:

92 0035

ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8"- 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
1	

REMARKS

Subtotal
Freight
Tax

PLANT: PLNT# 31 ST SEAL# 89
WEIGHMASTER: D. Billerbeck

Total

M.P. OR STATION		WEIGHTS		
			GROSS	27.62 TON
			TARE	12.15 TON
STREET INSP.	TIME RECEIVED		NET	15.47 TON
			NET TONS	14.03 Metric Ton

RECEIVED BY	LOADS TODAY	TONS TODAY

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WA. ST. CONT. REG. NO. 223-01 LA-KE-SI*-274JD

LAKESIDE INDUSTRIES

SEATTLE DIVISION

P.O. BOX 7 BELLEVUE, WA 98009

(206) 832-2709

DATE	LOAD TIME	TICKET NO.
10/27/99	10:59	48983

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
1325		CK 2577

SOLD TO

CASH SALES
SEATTLE

DELIVERED TO

JOB ID:

99-0035

ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8" - 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
1	

REMARKS

Subtotal
Freight
Tax

PLANT: PLNT# 31 ST SEAL# 89
WEIGHMASTER: D. Billerbeck

Total

M.P. OR STATION		WEIGHTS		
			GROSS	27.05 TON
			TARE	12.15 TON
STREET INSP.	TIME RECEIVED		NET	14.90 TON
			NET TONS	13.52 Metric Ton

RECEIVED BY	LOADS TODAY	TONS TODAY

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WA. ST. CONT. REG. NO. 223-01 LA-KE-SI-274JD

LAKESIDE INDUSTRIES

SEATTLE DIVISION
P.O. Box 7016 • Issaquah, WA 98027
Phone: (206) 632-2709

DATE	LOAD TIME	TICKET NO.
10/27/99	12:04	48994

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
1325		CR 2577

JOB ID.

SOLD TO	DELIVERED TO
CASH SALES SEATTLE	91-0035 ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8" - 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
1	

REMARKS

Subtotal
Freight
Tax

PLANT: PLNT# 31 ST SEAL# 89
WEIGHMASTER: D. Billerbeck

Total

27.13 TON

M.P. OR STATION		WEIGHTS	
			GROSS 12.15 TON
			TARE 15.03 TON
STREET INSP.	TIME RECEIVED		NET 13.64 Metric To
			NET TONS

RECEIVED BY	LOADS TODAY	TONS TODAY
Ty Kull		

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LAKESIDE INDUSTRIES

SEATTLE DIVISION

P.O. BOX 7 BELLEVUE, WA 98009

(206) 632-2709

DATE	LOAD TIME	TICKET NO.
10/27/99	12:32	48998

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
1325		CK 2577

SOLD TO

CASH SALES
SEATTLE

DELIVERED TO

JOB ID:

990035

ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8"- 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
1	

REMARKS

Subtotal
Freight
Tax

PLANT: PLNT# 31 ST SEAL# 89
WEIGHMASTER: D. Billerbeck

Total

M.P. OR STATION		WEIGHTS		
			GROSS	27.10 TON
			TARE	12.15 TON
STREET INSP.	TIME RECEIVED		NET	14.95 TON
			NET TONS	13.56 Metric To

RECEIVED BY	LOADS TODAY	TONS TODAY

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WA. ST. CONT. REG. NO. 223-01 LA-KE-SI*-274JD

LAKESIDE INDUSTRIES

SEATTLE DIVISION

P.O. BOX 7 BELLEVUE, WA 98009

(206) 632-2709

DATE	LOAD TIME	TICKET NO.
10/27/99	12:59	49002

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
1325		CK 2577

SOLD TO

CASH SALES
SEATTLE

DELIVERED TO

JOB ID:

99-0035

ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8"- 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
1	

REMARKS

Subtotal
Freight
Tax

PLANT: PLNT# 31 ST SEAL# 89
WEIGHMASTER: D. Billerbeck

Total

M.P. OR STATION		WEIGHTS		
			GROSS	28.51 TON
			TARE	12.15 TON
STREET INSP.	TIME RECEIVED		NET	16.36 TON
			NET TONS	14.84 Metric T

RECEIVED BY	LOADS TODAY	TONS TODAY

AN EQUAL OPPORTUNITY EMPLOYER

WA. ST. CONT. REG. NO. 223-01 LA-KE-SI*-274JD

LAKESIDE INDUSTRIES

SEATTLE DIVISION

P.O. BOX 7 BELLEVUE, WA 98009

(206) 632-2709

DATE	LOAD TIME	TICKET NO.
	11/02/99 07:24	45121

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
8296		

SOLD TO	DELIVERED TO
REMTECH INC.	JOB ID:
	ZONE:

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8"- 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
REM1	

REMARKS

PLANT: PLNT# 31 ST SEAL# 89

WEIGHMASTER: D. Billerbeck

M.P. OR STATION		WEIGHTS	GROSS	25.34 TON
			TARE	10.19 TON
STREET INSP.	TIME RECEIVED		NET	15.15 TON
			NET TONS	13.65 Metric Tons

RECEIVED BY	LOADS TODAY	TONS TODAY
	: Metric Tons	15.15 : 13.65

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WA. ST. CONT. REG. NO. 223-01 LA-KE-SI*274JD

LAKESIDE INDUSTRIES

SEATTLE DIVISION

P.O. BOX 7 BELLEVUE, WA 98009

(206) 632-2709

DATE	LOAD TIME	TICKET NO.
11/02/99	07:56	49124

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
8296		

SOLD TO	DELIVERED TO
REMTECH INC.	JOB ID: ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
814	5/8"- 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
REM1	

REMARKS

PLANT: PLNT# 01 ST SEAL# 84
WEIGHMASTER: D. Billenbeck

M.P. OR STATION		WEIGHTS		
			GROSS	29.03 TON
STREET INSP.	TIME RECEIVED		TARE	13.14 TON
			NET	15.89 TON
			NET TONS	14.42 Metric Tons
RECEIVED BY		LOADS TODAY		TONS TODAY
		2		28.84

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WA. ST. CONT. REG. NO. 223-01 LA-KE-SI*-274JD

LAKESIDE INDUSTRIES

SEATTLE DIVISION

P.O. BOX 7 BELLEVUE, WA 98009

(206) 632-2709

DATE	LOAD TIME	TICKET NO.
11/02/99	08:36	49128

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
8296		

SOLD TO	DELIVERED TO
REMTECH INC.	JOB ID: ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8"- 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
REM1	

REMARKS

PLANT: PLNT# 31 ST SEAL# 99
WEIGHMASTER: D. Billerbeck

M.P. OR STATION		WEIGHTS		
			GROSS	28.09 TON
STREET INSP.	TIME RECEIVED		TARE	13.13 TON
			NET	15.36 TON
			NET TONS	14.39 Metric Tons

RECEIVED BY	LOADS TODAY	TONS TODAY
	3	47.90
	Metric Tons:	43.46

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WA. ST. CONT. REG. NO. 223-01 LA-KE-SI*-274JD

NORTHWEST BUSINESS FORMS INC. - SEATTLE, WA

31992 RQ

LAKESIDE INDUSTRIES

SEATTLE DIVISION

P.O. BOX 7 BELLEVUE, WA 98009

(206) 632-2709

DATE	LOAD TIME	TICKET NO.
11/02/99	09:06	49134

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
8896		

SOLD TO	DELIVERED TO
REMTECH INC.	JOB ID: ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8"- 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
REM1	

REMARKS

PLANT: PLNT# 31 ST SEAL# 89
WEIGHMASTER: D. Billerbeck

M.P. OR STATION		WEIGHTS		
			GROSS	27.71 TON
			TARE	13.19 TON
STREET INSP.	TIME RECEIVED		NET	14.52 TON
			NET TONS	14.00 Metric Tons

RECEIVED BY	LOADS TODAY	TONS TODAY
	4	57.44
	Metric Tons:	57.04

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WA. ST. CONT. REG. NO. 223-01 LA-KE-SI*-274JD

LAKESIDE INDUSTRIES

SEATTLE DIVISION
P.O. BOX 7 BELLEVUE, WA 98009
(206) 632-2709

DATE	LOAD TIME	TICKET NO.
11/02/99	09:4:	49143

CUSTOMER ID NO.	ITEM NO.	P.O. NO.
8296		

SOLD TO	DELIVERED TO
REMTECH INC.	JOB ID: ZONE: : :

PRODUCT NO.	PRODUCT DESCRIPTION
214	5/8"- 0" CRUSHED ROCK

TRUCK NO.	TRUCK DESCRIPTION
REM1	

REMARKS

PLANT: PLNT# 31 ST SEAL# 89
WEIGHMASTER: D. Billerback

M.P. OR STATION		WEIGHTS		
			GROSS	29.84 TON
			TARE	13.79 TON
STREET INSP.	TIME RECEIVED		NET	16.05 TON
			NET TONS	14.56 Metric Tons

RECEIVED BY	LOADS TODAY	TONS TODAY
	5 Metric Tons:	79.47 72.10

AN EQUAL OPPORTUNITY EMPLOYER
WA. ST. CONT. REG. NO. 223-01 LA-KE-SI*-274JD

www.hartcrowser.com

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Tel 907.276.7475

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Beverly, Massachusetts 01915-6123
Fax 978.921.8164
Tel 978.921.8163

Chicago
626 North Western Avenue
Lake Forest, Illinois 60045-1921
Fax 847.295.3033
Tel 847.295.0077

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Lakewood, Colorado 80228-1835
Fax 303.987.8907
Tel 303.986.6950

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Fortuna, California 95540
Fax 707.726.9146
Tel 707.726.9145

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1896 Marika Street, Unit 1
Fairbanks, Alaska 99709-5545
Fax 907.451.6056
Tel 907.451.4496

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Jersey City, New Jersey 07302-3726
Fax 201.985.8182
Tel 201.985.8100

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319 Seward Street, Suite 1
Juneau, Alaska 99801-1173
Fax 907.586.1071
Tel 907.586.6534

Long Beach
One World Trade Center, Suite 2460
Long Beach, California 90831-2460
Fax 562.495.6361
Tel 562.495.6360

Portland
Five Centerpointe Drive, Suite 240
Lake Oswego, Oregon 97035-8652
Fax 503.620.6918
Tel 503.620.7284

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1910 Fairview Avenue East
Seattle, Washington 98102-3699
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