DEPARTMENT OF ECOLOGY
NWRO/TCP TANKS UNIT

INTERIM CLEANUP REPORT ☐
SITE CHARACTERIZATON ☐
FINAL CLEANUP REPORT ☐
OTHER Soil treatment/disposal ☑
AFFECTED MEDIA: SOIL ☑
OTHER _____ GW ☐
INSPECTOR (INIT.) _____ DATE 10-11-94

SR 10/21/94

40004402
003589

LUST INC.# 3566
BLOCH STEEL INDUSTRIE
King Co / Seattle

RECEIVED
SEP 28 1994
DEPT. OF ECOLOGY

"Disposition of Excavated Soils" - August 19, 1994

Addenda to UST Closure Report dated June 30, 1992

RECEIVED
SEP 22 1994
ECOLOGY

Site: **Bloch Steel Industries**
Seattle, Washington

Guidance: Independent Remedial Action Report
UNDER THE MODEL TOXICS CONTROL ACT
CHAPTER 70.105D RCW

Submitted By: Fred S. Benz, P.E.
WA State #28739

FRED S. BENZ
STATE OF WASHINGTON
28739
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES: 3/6/95

Independent Action Report Update

Site Name: Bloch Steel Industries

Inc. #: 3566 Date of Report: 8-19-94

County: King Date Report Rec'd: 9-28-94

Reviewed by: J. Hickey

Comments (please include: free prod., tank info., media, contaminant migration, GW conc. trends, PCS treated/fate?):

This report deals with the "disposition" of soils excavated and treated (partially) as a result of a previous tank removal. The site is not cleaned up. There are still levels of contamination remaining in un-excavated soil similar to the levels obtained in the excavated soil, per Fred Benz (up to 25,000 ppm TPH). The contamination may not be all from the tank. Groundwater was not present at the time of soil excavation, but may be present at other times & there may be tidal influence, per Fred Benz.

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SECTION ONE

1.0 PROJECT BACKGROUND/SITE DESCRIPTION

Bloch Steel has implemented several facility upgrades in order to increase efficiency and protect the environment. The original Underground Storage Tank (UST) was removed in early 1992 and replaced with a monitored aboveground, double wall, secondary containment tank located at another protected area within the facility. All machinery installations on site have had secondary containment improvements and the personnel are updated regularly regarding environmental, health and safety concerns.

During the removal of the UST it was incorrectly estimated that "over 250 cubic yards" of petroleum contaminated soil was removed from the area surrounding the tank installation. Recently, as the soil was disposed, weight tickets were kept and totaled 233.90 tons. The original estimate was based on visual estimates in stockpile, the final weight total was accurately scaled. Due to the type and level of soil contaminant, on site land farming of the soil was implemented in an attempt to reduce or eliminate the petroleum contaminant. Due to the nature of the heavier petroleum contaminant, it was expected that at least contaminant levels would be reduced.

1.0.1 LOCATION

Property Owner: Bloch Steel Industries
4580 Colorado So.
Seattle, Washington
#(206)763-0200

Contact: Dennis Bloch

Past site activity:

"UST Closure Report - June 30, 1992"
Underground Storage Tank Closure
1-4000 UST (Diesel Oil)

Background Information

The site has been used as a scrap iron recycling facility since 1938. The UST was used to store Diesel Fuel for operation support. For over

thirty (30) years the area above and immediately surrounding the UST was used for diesel fueling and for storage and dispensing of motor fuel, motor oil, and hydraulic oils. Small surface spills over the years into the soil contributed to the contaminated soils found. This area is no longer used as a fueling or storage facility of petroleum products. Interviews with the owner and other area owners indicated that this site and the general area had operated as a landfill for sometime prior to use as a scrap iron facility.

1.0.2 TOPOGRAPHY AND GEOLOGY

Geologic Materials - Variable Sandy Fill

Within the depths of our explorations, the geologic materials beneath the site consist of a silty sand fill from ground surface to a depth of 6 to 7 feet. Although the composition of the fill varies across the site, the fill is predominantly a medium-fine sand. In other local area sites, materials beneath the sand fill consist of a flurial/tidal deposited silty sand. In this case it is not known the depth or the nature of the original sandy material, but conditions are similar to other sites in the area.

Unified Soil Classification System (ASTM Designation D-2487)
"**SM**" - "Silty sands, sand-silt mixture"
"**SC**" - "Clayey sands, sand-clay mixtures"

1.1 RELEASE INFORMATION/SITE CHARACTERIZATION

See "UST Closure Report/Site Characterization" dated June 12, 1992[1]

1.2 PREVIOUS INVESTIGATIONS

"UST Closure Report/Site Characterization" - June 12, 1992

1.3 SELECTION OF CLEANUP STANDARDS

Method A Cleanup Standards-Industrial Soil[2]

Hazardous Substance	CAS Number	Cleanup Levels
Arsenic	7440-38-2	200.0 ppm
Benzene	71-43-2	0.5 ppm

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[1] "UST Closure Report, Site Characterization, Bloch Steel Industries", 6/30/92, Fred Benz

[2] The Model Toxic Control Act, Cleanup Regulation, Chapter 173-340 WAC, 12/93,#94-06

Cadmium	7440-43-9	10.0 ppm
Chromium(total)	7440-47-3	500.0 ppm
Ethylbenzene	100-41-4	20.0 ppm
Mercury(Inorganic)	7439-97-6	1.0 ppm
Lead	7439-92-1	1000.0 ppm
Toluene	108-88-3	40.0 ppm
Xylenes	1330-20-7	20.0 ppm
TPH (gasoline)		100.0 ppm
TPH (diesel)		200.0 ppm
TPH (other)		200.0 ppm
PCB (mixtures)		10.0 ppm

B. This cleanup criteria follows guidance offered currently by the Dept. of Ecology including but not limited to the following:

-Guidance for Remediation of Releases from UST's #91-30
-Guidance for Site Checks and Site Assessments for UST's #90-52
-Model Toxics Control Act #173-340 WAC

1.4 EXPLANATION OF REMEDIAL ACTIONS TAKEN AND RATIONALE FOR SELECTING THE REMEDIAL ACTION

Proposed Selected Treatment Options

A contaminated soil remediation program had been instituted at the site and all excavated contaminated soil was treated on site. The following is a brief description of the preferred method.

Land Farming

"Land-farming" or "composting" is an aboveground soil management technique combining both aeration and bioremediation. Aeration enhances microbial degradation by providing oxygen to the soil/waste mixture. Bioremediation involves addition of oxygen and nutrients in a controlled setting. This is done by excavating soil and placing it in mounds or small lifts to be tilled or turned increasing the rate of oxygenation and evaporation. Tilling, while providing an oxygen source, will volatilize substantial portions of gasoline or more volatile components.

Appropriate nutrient application rates must be determined based on waste type, waste concentration and soil characteristics. Nitrogen and phosphorous are two nutrients commonly required in the bioremediation process. The process produces a stabilized, enriched, humus-like material which can be returned to the land. Sludges or contaminated soils are mixed with a bulking agent, such as bark, and wood chips to increase the

air-filled pore space within the pile. Most sites can be remediated within 6 months to up to 4 years or longer. Heavier oils or diesel products experience somewhat longer treatment times and are potentially less effective with the heavier contaminant.

1.5 INSTITUTIONAL CONTROLS

Contamination was removed from UST excavation areas and treated in an on-site land farm operation to recycle the soil for other uses, and destroy contaminants by Biological treatment. Treatment involved measuring and managing nutrients, Ph, oxygen, water content, and other factors to enhance biological activity. The site was lined with an impervious liner and earthen berms were constructed around the perimeter. The site was covered when not in use to control rainwater infiltration or absorbtion. The site is fenced, locked, and entry access was strictly controlled.

1.6 SAMPLING AND ANALYSIS

1.6.1 Site Sampling - Analytical for disposal to landfill

Sampling was done according to requirements for landfill at Regional Disposal's facility and are outlined below. Copies of the chain of custody and analytical results are attached as part of this report. The sample taken by West Pac Environmental, Inc. was a representative composite and taken at various locations throughout the stockpiled soil.

1.6.2 Sample Container and preservative requirements(TYP):

Analysis	Containers	Preservation	Type/Hold
Total Petroleum Hydrocarbons	4oz. wide mouth glass jar with Teflon lid liner	Cool to 4°C and maintain	Mthd WTPH 418.1 28 days max

1.6.3 Laboratory analyses to be performed:

Closure Requirements

Soil - Method WTPD-HCID	Petroleum Qualitative Screening
Method WTPH 418.1	TPH Petroleum Compounds
Method WTPH-D	Diesel Compounds

Roosevelt Regional Landfill Requirements.:

Soil - Method WTPD-HCID	Petroleum Qualitative Screening

Method WTPD-418.1	TPH Petroleum Compounds
Method WTPH-D	Diesel Compounds
Method 8240/8270	

IFF: (Please advise prior)

TPH > 5000 PPM	TCLP Metals, Volatiles, & Semi-Volatiles
TPH > 5000 PPM	PAH (WAC 173-303-102)
TPH > 30000 PPM	Toxicity Fish WAC 173-303-101(5)

1.6.4 Name of Laboratory used for chemical analyses:

American Analytical Services, Inc.
8220 7th Ave. So.
Seattle, WA 98108

Mr. Jerry Lofgren
#(206)762-7599
#(206)762-7665 Fax

Alternate:
Spectra Laboratories, Inc.
2221 Ross Way
Tacoma, WA 98421

#(206)272-4850
#(206)572-9838 Fax

1.6.5 A description of QA/QC procedures to be used:

Each batch of samples includes; Surrogate, Matrix Spike, Duplicate, Method Blank, Blank Spike results and are included as part of lab report. (QA/QC on file)
(D.O.E. approved laboratory facilities)

Conclusions

233.90 tons of contaminated soil was excavated and placed in a controlled cell for land farming and bioremediation of petroleum contaminants. The bio/farming treatment significantly reduced contaminant levels from the 10,000 to 20,000 ppm range to below 5,000 ppm. The treatment did not eliminate the contaminants completely in the time frame, yet the soil began to heartily support plant life. It was decided to finalize the on-site treatment program and remove the soils to Roosevelt Regional Landfill for use as landfill cover where longer placement times are available.

Respectfully submitted,

Fred S. Benz, P.E.
Registered Site Assessor, D.O.E.

A P P E N D I X[3]

At the request of Bloch Steel Industries, the following potential remediation techniques have been outlined. Costs are estimates only, further detail is beyond the scope of this report.

The Toxics Cleanup Program and the Solid and Hazardous Waste Program of Ecology encourage on-site treatment where the actions themselves will not cause a threat to human health or the environment. The Model Toxics Control Act (MTCA) requires that Ecology give preference to permanent solutions for the site cleanup.

Preferred Category:

1) Reuse or recycling;
2) Destruction or detoxification;
3) Separation or volume reduction, followed by reuse, recycling, destruction, or detoxification;
4) Immobilization;
5) On-site or off-site disposal at an engineered facility;
6) Isolation or containment; and
7) Institutional controls and monitoring

Soil Bioremediation

Bioremediation involves addition of oxygen and nutrients in a controlled setting. This is typically done by excavating soil and placing it in mounds or small lifts. Airflow (oxygen supply) through the soil is accomplished with perforated pipes (more appropriate for gasoline) or tilling (appropriate for diesel or heavier petroleum contamination). "Land-farming" or "composting" is a combination of both aeration and bioremediation.

Appropriate nutrient application rates must be determined based on waste type, waste concentration and soil characteristics. Nitrogen and phosphorous are two nutrients commonly limiting in the bioremediation process. A source of oxygen must also be provided through tilling or an air blower with perforated piping. Tilling, while providing an oxygen source, will volatilize substantial portions of gasoline. Most sites can be remediated within 6-9 months.

Permits: Air permits (P.S.A.P.C.A.), local fill and grading permits and water discharge permits.

Estimated Cost of remediation: $75 to $95 per cubic yard

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[3] "Guidance for Remediation of Releases from Underground Storage Tanks", WSDOE, #91-30

Aeration

This solution for treatment of PCS evaporates volatile components of petroleum from the soil into the air. Soil is spread in thin lifts and tilled or turned to increase the rate of evaporation. This treatment method should not be used in urban areas or other locations where organic vapors could cause health, fire, or nuisance hazards.

Permits: Probable air permit required Olympic A.P.C.A.

Estimated Cost of remediation: $70 to $85 per cubic yard

Soil Venting

This technology involves installing vertical or horizontal piping in the area of soil contamination. An air "blower" is then used to draw vapors out of the ground. The technology is appropriate for volatile contaminants only (e.g. much of gasoline contamination can be treated using this technology, but it is not effective for diesel). Soil may be excavated and placed in mounds or back in the pit. In situ soil venting involves only the installation of pipes in the contaminated area. No excavation is done.

Extraction wells should be placed as close as possible to the most heavily contaminated areas. Spacing must be close enough to minimize the distance which contaminants must travel and allow for adequate vacuum through the volume to be treated.

Estimated Cost of remediation: $40 to $50 per cubic yard

Permits: Probable air permit required Olympic A.P.C.A.

Thermal Desorption

This technology heats soil to 300-700°F which results in evaporation of some hydrocarbons. Other hydrocarbons will remain in the soil depending on: 1) soil temperature; 2) soil moisture content; 3) soil texture; 4) residence time in the treatment unit; 5) contaminant type; and 6) contaminant concentration. Subsequent incineration of off-gases (approximately 1500°F) can provide destruction of organics in these off-gases. Off-gases should be monitored to allow determination of the amount of hydrocarbons going out the stack versus the amount actually being destroyed.

Estimated Cost of remediation: $60 to $80 per cubic yard

Permits: Probable air permit required Olympic A.P.C.A., local fill and grading permits, and, water discharge permits.

Landfilling

This solution for wastes is the least preferred according to the regulations for the Model Toxics Control Act and the Solid Waste Management Law. It should be used only when other solutions are not available.

Estimated Cost of remediation: $80 to $100 per cubic yard

Note: The conclusions and recommendations contained in this review are based upon professional opinions with regard to the subject matter. These opinions have been arrived at in accordance with currently accepted environmental consulting and engineering standards and practices applicable to this location. All proposals or methods described herein are offered without warranties or representations, either express or implied, as to the effectiveness or performance of design(s).

AMERICAN ANALYTICAL SERVICES, INC.
8220 7TH AVENUE SOUTH
SEATTLE, WA 98108
(206) 762-7599 / FAX (206) 762-7665

CHAIN OF CUSTODY/REQUEST FOR LABORATORY ANALYSIS

AASI Batch #: 06-007

CLIENT: West Pac
PROJECT NAME: Back Slot
PROJECT #: Soil Disposal
CONTACT: Mike Anthney
PHONE #:

LAB #	SAMPLE I.D.	DATE	TIME	MATRIX	# of Containers/Size	WTPH-418.1	WTPH-HCID	WTPH-D	WTPH-G/BTEX	Total Metals (8 or 11)	TCLP Metals (8 or 11)	GC/MS Volatiles (8240)	GC/MS Semi-Volatiles (8270)	PCB's	TOX	8240	8270
-1	Stock Pile	6-1	11:45	Soil	1	X	X	X			X			X		X	X

ADD 6-2-94 Per Mike Anthney

ADD 6-2-94 per Mike Anthney

	Printed Name	Signature	Company	Date/Time	Special Instructions/Comments
Relinquished by:	Ken Ewing	Ken Ewing	Weststar	6-1-94 12:30	
Received by:	Terri Magill	Terri Magill	AASI	6-1 / 12:30	
Relinquished by:					
Received by:					
Relinquished by:					
Received by:					

By signing this form you are agreeing to the terms and conditions listed on the back.

Job No. 94-1703
Acct. No. 10498

BILL OF LADING
PETROLIUM CONTAMINATED SOIL

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

This Bill of Lading augments the Master Service Agreement entered into by West Pac ("Customer") and Regional Disposal Company("RDC") on _____ ("Agreement"). 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 described in Certification No. 94-1703 signed by Customer on _____ ("Waste"), for disposal at Roosevelt Regional Landfill. Customer shall present a copy of this Bill Of Lading with each shipment delivered.

Location of Waste: 4580 Colorado S. Seattle

Method of Shipment: West Pac Truck

Additional Fees (e.g., laboratory, transport or special handling fee; if none, so state): None

PERFORMANCE DATE

For RDC Transportation: Customer shall make the Waste available for shipment no later than 8-30-94. RDC shall transport the Waste no later than 8-30-94 unless RDC notifies 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 (Roosevelt Regional Landfill ☐) or (Seattle Transfer Station located at Third & Lander ☒) no later than 8-30-94, and shall complete delivery of the Waste no later than 8-30-94 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). Return of containers after delivery completion date stated above shall be charged rent at $ N/A per week.
(Fill in per Model Served Agreement)

Shannon A. Henry — Signature of Authorized Agent — 7-28-94 Date

For: R.D.C. — Regional Disposal Company

[signature] — Signature of Authorized Agent — 7/26/94 Date

For: West Pac Environmental — Customer

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

Revised 1/94

No._____

CERTIFICATION

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

GENERAL INFORMATION FOR PETROLIUM CONTAMINATED SOIL

1. Customer's name and address: West PAC Environmental
   Phone: 762-1190 Fax: 762-9362
2. Owner's name and address *(owner of property where soil originated, if different from #1)* Block Steel
   Phone: 763-0200 Fax: 762-1011
3. Hauler's name and address: West Pac
   Phone: 762-1190 Fax: 762-9362
4. Consultant's name and address: FSB Enterprises, Inc.
   Phone: 781-2113 Fax: _____
5. Amount of Waste: 200 yds
6. Waste's current location *(include nearest road and railhead access, if known)*: 4580 Colorado S. Seatt
7. Original location of contaminated soil: 4580 Colorado S. Seattle
8. Activity which generated Waste: LUST
9. Does waste have potential for creating fugitive dust? YES ☐ NO ☒
   If yes, what is your plan of action to mitigate dust? _____
10. Please check appropriate boxes describing activities which occurred on or near the soil's current and original locations:

	Current location	Original location		Current location	Original location
a. Tank Storage: petroleum products	☐	☒	g. Wrecking/materials recovery	☒	☒
b. Tank storage: waste oil or other	☐	☐	h. Manufacturing	☐	☐
c. Fuel handling or transfer	☐	☐	i. painting/sealing	☐	☐
d. Handling or transfer of other liquids	☐	☐	j. Waste disposal	☐	☐
e. Wood preservative handling	☐	☐	k. Other (please describe)	☐	☐
f. Use of solvents	☐	☐			

PETROLIUM CONTAMINATED SOIL WASTE ANALYSIS

Customer shall indicate completion of the following by initial:

__1. Waste samples were collected in accordance with WAC 173-303-110 (2).
__2. Lab analytical procedures complied with WAC 173-303-110 (3).
__3. Waste has been analyzed in accordance with RDC's latest waste acceptance protocols.
__4. Chain of custody and lab analytical data for required waste analyses is attached.

Customer certifies that:

1. The Waste sampled and intended for disposal under this Certification is neither Dangerous nor Extremely Hazardous Waste as determined by Ch. 173-303-WAC.
2. The Waste has no free liquids per WAC 173-303-110 (3)(c)(i).
3. Customer further certifies that to the best of its knowledge, there have been no alterations to the Waste that would affect the accuracy of the analyses performed above; that there have been no material changes in the character of the Waste after the analyses were performed which would render those analyses inaccurate; and that the samples analyzed are representative of the Waste to be tendered to Regional Disposal Company.

This document (including its attachments) is hereby incorporated into the MASTER SERVICE AGREEMENT for PETROLIUM CONTAMINATED SOIL executed by _____ and Regional Disposal Company on _____, 19___ ("Agreement"). If there are conflicts between this Certification and the Agreement, the Agreement's terms shall prevail.

Signature of Authorized Agent

7/25/94
Date

Printed Name and Title Michael Antney C.P.S.

For: West PAC Environmental
Customer

Revised 1/94

SUMMARY OF LOADS HAULED — INVOICE #947705-08

DATE	TICKET #	GROSS	TARE	NET	NET TONS	CONTAINER #	SEAL #
PCS-City of Seattle @ Transfer Station							
08/01/94	297876	47,220	23,960	23,260	11.630		
08/01/94	297919	51,400	23,980	27,420	13.710		
08/01/94	297942	45,640	23,420	22,220	11.110		
08/01/94	297968	51,960	23,960	28,000	14.000		
08/01/94	297975	51,740	23,440	28,300	14.150		
08/01/94	297998	51,400	23,940	27,460	13.730		
08/01/94	298004	55,120	23,400	31,720	15.860		
08/01/94	298017	53,460	23,840	29,620	14.810		
08/01/94	298034	55,140	23,380	31,760	15.880		
08/01/94	298041	54,380	23,900	30,480	15.240		
08/01/94	298057	50,700	22,640	28,060	14.030		
08/01/94	298070	55,260	23,360	31,900	15.950		
08/01/94	298074	53,960	23,900	30,060	15.030		
08/01/94	298103	54,760	23,440	31,320	15.660		
08/01/94	298108	44,820	22,700	22,120	11.060		
08/01/94	298123	46,840	23,880	22,960	11.480		
08/01/94	298139	40,180	23,380	16,800	8.400		
08/01/94	298173	28,200	23,860	4,340	2.170		
Total for PCS-City of Seattle @ Transfer Station					233.900		

Date of Report: 7/1/94
Samples Submitted: 6/1/94
File ID: 06-007
Analysis: WTPH-HCID
Unit: mg/kg (ppm)

Client: West Pac
Project: Block Steel
Project #: Soil Disposal
Matrix: Soil

Results

Lab ID	Client ID	GC Characterization	Surrogate Recovery
06-007-1	Stock Pile	The chromatogram indicates the presence of hydrocarbons in the Diesel (C12-C24) and Heavy Oil (>C24) range.	112%
Quality Assurance			
Method Blank		<20 ppm Gasoline <50 ppm Diesel <100 ppm Oil	79%

ppm - parts per million

Date of Report: 7/1/94
Samples Submitted: 6/1/94
File ID: 06-007
Analysis: WTPH-D
Units: mg/kg (ppm)

Client: West Pac
Project: Block Steel
Project #: Soil Disposal
Matrix: Soil

Results

Lab ID	Client ID	Result	Surrogate Recovery
06-007-1	Stock Pile	4,200	Y
Quality Assurance			
06-007-1 Duplicate		3,900	Y
Method Blank		<50	99%

ppm - parts per million
Y - Interferences were present which prevented quantitation of the surrogate recovery.

Date of Report: 7/1/94
Samples Submitted: 6/1/94
File ID: 06-007
Analysis: WTPH-418.1
Units: mg/kg (ppm)

Client: West Pac
Project: Block Steel
Project #: Soil Disposal
Matrix: Soil

Lab ID	Customer ID	Result
06-007-1	Stock Pile	6,900
Quality Assurance		
06-007-1 Duplicate		7,200
Method Blank		<20

ppm - parts per million

Date of Report: 7/1/94
Samples Submitted: 6/1/94
File ID: 06-007
Analysis: PCB's
Units: mg/kg (ppm)

Client: West Pac
Project: Block Steel
Project #: Soil Disposal
Matrix: Soil

Lab ID	Client ID	Result	Surrogate Recovery
06-007-1	Stock Pile	0.4*	90%
Quality Assurance			
06-007-1 Duplicate		0.4*	88%
Method Blank		<0.1	115%
06-007-1 Matrix Spike		116%	96%
Blank Spike		109%	106%

ppm - parts per million
* - Aroclor identified as a mixture of Aroclor 1254 and Aroclor 1260.

Date of Report: 7/1/94
Samples Submitted: 6/1/94
File ID: 06-007
Analysis: TCLP Metals (8)
Unit: mg/L (ppm)

Client: West Pac
Project: Block Steel
Project #: Soil Disposal
Matrix: Soil

Results

Sample Number / Client Number	06-007-1 Stock Pile	06-007-1 Duplicate	Method Blank	Matrix Spike
Silver	<0.1	<0.1	<0.1	86%
Arsenic	<0.1	<0.1	<0.1	96%
Barium	0.59	0.56	<0.1	98%
Cadmium	<0.1	<0.1	<0.1	102%
Chromium	<0.1	<0.1	<0.1	100%
Mercury	<0.003	<0.003	<0.003	114%
Lead	2.5	0.5	<0.1	102%
Selenium	<0.5	<0.5	<0.5	93%

ppm - parts per million

Sample #: West Pac - #Stock Pile

Method:	EPA 8240	**AASI#:**	06-007-01	
Analyst:	Mark Z Perin	**Data File:**	C:\HPCHEM\1\DATA\06-30-94\	2601010.D
Matrix:	Soil	**Instrument:**	GCMS1	
Sample (g):	1	**Extraction:**	07/01/94	
Extract (ml):	5	**Analysis:**	07/01/94	
Sparge (ml):	5			

Surrogates	Recovery	Limits
1,2-Dichloroethane-d4	110%	70-121
Toluene-d8	116%	84-138
Bromofluorobenzene	101%	59-113

Target Analytes	Concentration (ppb)
Chloromethane	ND<25
Vinyl Chloride	ND<25
Bromomethane	ND<25
Chloroethane	ND<25
1,1-Dichloroethene	ND<25
Carbon Disulfide	ND<25
Acetone	26
Methylene Chloride	150
1,2-Dichloroethene (total)	ND<25
1,1-Dichloroethane	ND<25
Chloroform	31
1,2-Dichloroethane	ND<25
2-Butanone	ND<25
1,1,1-Trichloroethane	ND<25
Carbon Tetrachloride	ND<25
Benzene	ND<25
Trichloroethene	ND<25
1,2-Dichloropropane	ND<25
Bromodichloromethane	ND<25
cis-1,3-Dichloropropene	ND<25
trans-1,3-Dichloropropene	ND<25
1,1,2-Trichloroethane	ND<25
Dibromochloromethane	ND<25
Bromoform	ND<25
4-Methyl-2-Pentanone	ND<25
Toluene	ND<25
Tetrachloroethene	ND<25
2-Hexanone	ND<25
Chlorobenzene	ND<25
Ethylbenzene	ND<25
Xylene (total)	ND<25
Styrene	ND<25
1,1,2,2-Tetrachloroethane	ND<25

QC = Quality control limits exceeded

Sample #: West Pac - #Stock Pile Duplicate

Method:	EPA 8240	**AASI#:**	06-007-01 dup	
Analyst:	Mark Z Perin	**Data File:**	C:\HPCHEM\1\DATA\06-30-94\	2701011.D
Matrix:	Soil	**Instrument:**	GCMS1	
Sample (g):	1	**Extraction:**	07/01/94	
Extract (ml):	5	**Analysis:**	07/01/94	
Sparge (ml):	5			

Surrogates	Recovery	Limits
1,2-Dichloroethane-d4	106%	70-121
Toluene-d8	125%	84-138
Bromofluorobenzene	105%	59-113

Target Analytes	Concentration (ppb)
Chloromethane	ND<25
Vinyl Chloride	ND<25
Bromomethane	ND<25
Chloroethane	ND<25
1,1-Dichloroethene	ND<25
Carbon Disulfide	ND<25
Acetone	ND<25
Methylene Chloride	149
1,2-Dichloroethene (total)	ND<25
1,1-Dichloroethane	ND<25
Chloroform	36
1,2-Dichloroethane	ND<25
2-Butanone	ND<25
1,1,1-Trichloroethane	ND<25
Carbon Tetrachloride	ND<25
Benzene	ND<25
Trichloroethene	ND<25
1,2-Dichloropropane	ND<25
Bromodichloromethane	ND<25
cis-1,3-Dichloropropene	ND<25
trans-1,3-Dichloropropene	ND<25
1,1,2-Trichloroethane	ND<25
Dibromochloromethane	ND<25
Bromoform	ND<25
4-Methyl-2-Pentanone	ND<25
Toluene	ND<25
Tetrachloroethene	ND<25
2-Hexanone	ND<25
Chlorobenzene	ND<25
Ethylbenzene	ND<25
Xylene (total)	ND<25
Styrene	ND<25
1,1,2,2-Tetrachloroethane	ND<25

QC = Quality control limits exceded

Sample #: Method Blank

Method:	EPA 8240	**AASI#:**	Method Blank	
Analyst:	Mark Z Perin	**Data File:**	C:\HPCHEM\1\DATA\06-30-94\	1901003.D
Matrix:	Blank	**Instrument:**	GCMS1	
Sample (g):	1	**Extraction:**	06/30/94	
Extract (ml):	5	**Analysis:**	06/30/94	
Sparge (ml):	5			

Surrogates	Recovery	Limits
1,2-Dichloroethane-d4	107%	70-121
Toluene-d8	98%	84-138
Bromofluorobenzene	101%	59-113

Target Analytes	Concentration (ppb)
Chloromethane	ND<25
Vinyl Chloride	ND<25
Bromomethane	ND<25
Chloroethane	ND<25
1,1-Dichloroethene	ND<25
Carbon Disulfide	ND<25
Acetone	30
Methylene Chloride	ND<25
1,2-Dichloroethene (total)	ND<25
1,1-Dichloroethane	ND<25
Chloroform	ND<25
1,2-Dichloroethane	ND<25
2-Butanone	ND<25
1,1,1-Trichloroethane	ND<25
Carbon Tetrachloride	ND<25
Benzene	ND<25
Trichloroethene	ND<25
1,2-Dichloropropane	ND<25
Bromodichloromethane	ND<25
cis-1,3-Dichloropropene	ND<25
trans-1,3-Dichloropropene	ND<25
1,1,2-Trichloroethane	ND<25
Dibromochloromethane	ND<25
Bromoform	ND<25
4-Methyl-2-Pentanone	ND<25
Toluene	ND<25
Tetrachloroethene	ND<25
2-Hexanone	ND<25
Chlorobenzene	ND<25
Ethylbenzene	ND<25
Xylene (total)	ND<25
Styrene	ND<25
1,1,2,2-Tetrachloroethane	ND<25

QC = Quality control limits exceeded

Sample #: **West Pac - Stockpile**

Method:	EPA 8270	**AASI#:**	06-007-01	
Analyst:	Mark Z Perin	**Data File:**	C:\HPCHEM\1\DATA\06-30-94\	0501006.D
Matrix:	Soil	**Instrument:**	GCMS2	
Sample (g):	5	**Extraction:**	06/30/94	
Extract (ml):	1	**Analysis:**	06/30/94	

Surrogates	Recovery	Limits
2-Fluorophenol	73%	25-125
Phenol-d5	47%	24-113
Nitrobenzene-d5	55%	23-120
2-Fluorobiphenyl	64%	30-115
2,4,6-Tribromophenol	68%	19-122
Terphenyl-d14	90%	18-137

Target Analytes	Concentration (ppm)
bis(2-Chloroethyl)ether	ND<0.100
Phenol	ND<0.100
2-Chlorophenol	ND<0.100
1,3-Dichlorobenzene	ND<0.100
1,4-Dichlorobenzene	ND<0.100
1,2-Dichlorobenzene	ND<0.100
Benzyl alcohol	ND<0.100
bis(2-chloroisopropyl)ether	ND<0.100
2-Methylphenol	ND<0.100
Hexachloroethane	ND<0.100
N-Nitroso-di-n-propylamine	ND<0.100
4-Methylphenol	ND<0.100
Nitrobenzene	ND<0.100
Isophorone	ND<0.100
2-Nitrophenol	ND<0.100
2,4-Dimethylphenol	ND<0.100
bis(2-Chloroethoxy)methane	ND<0.100
2,4-Dichlorophenol	ND<0.100
1,2,4-Trichlorobenzene	ND<0.100
Naphthalene	0.166
4-Chloroaniline	ND<0.100
Hexachlorobutadiene	ND<0.100
4-Chloro-3-methylphenol	ND<0.100
2-Methylnaphthalene	0.192
Hexachlorocyclopentadiene	ND<0.100
2,4,6-Trichlorophenol	ND<0.100
2,4,5-Trichlorophenol	ND<0.100

(continued)

Sample #: West Pac - Stockpile (page 2)

2-Chloronaphthalene	ND<0.100
2-Nitroaniline	ND<0.100
Acenaphthylene	ND<0.100
Dimethylphthalate	ND<0.100
2,6-Dinitrotoluene	ND<0.100
Acenaphthene	ND<0.100
3-Nitroaniline	ND<0.100
2,4-Dinitrophenol	ND<0.100
Dibenzofuran	ND<0.100
2,4-Dinitrotoluene	ND<0.100
4-Nitrophenol	ND<0.100
Fluorene	ND<0.100
4-Chlorophenyl-phenylether	ND<0.100
Diethylphthalate	ND<0.100
4-Nitroaniline	ND<0.100
4,6-Dinitro-2-methylphenol	ND<0.100
n-Nitrosodiphenylamine	ND<0.100
4-Bromophenyl-phenylether	ND<0.100
Hexachlorobenzene	ND<0.100
Pentachlorophenol	ND<0.100
Phenanthrene	ND<0.100
Anthracene	ND<0.100
Di-n-butylphthalate	ND<0.100
Fluoranthene	ND<0.100
Pyrene	ND<0.100
Butylbenzylphthalate	ND<0.100
3,3'-Dichlorobenzidine	ND<0.100
Benzo[a]anthracene	ND<0.100
Chrysene	ND<0.100
bis(2-Ethylhexyl)phthalate	0.353
Di-n-octylphthalate	ND<0.100
Benzo[b]fluoranthene	ND<0.100
Benzo[k]fluoranthene	ND<0.100
Benzo[a]pyrene	ND<0.100
Indeno[1,2,3-cd]pyrene	ND<0.100
Dibenz[a,h]anthracene	ND<0.100
Benzo[g,h,i]perylene	ND<0.100

Sample #: West Pac - Stockpile Duplicate

Method:	EPA 8270	**AASI#:**	06-007-01 dup	
Analyst:	Mark Z Perin	**Data File:**	C:\HPCHEM\1\DATA\06-30-94\	0601007.D
Matrix:	Soil	**Instrument:**	GCMS2	
Sample (g):	5	**Extraction:**	06/30/94	
Extract (ml):	1	**Analysis:**	06/30/94	

Surrogates	Recovery	Limits
2-Fluorophenol	67%	25-125
Phenol-d5	46%	24-113
Nitrobenzene-d5	53%	23-120
2-Fluorobiphenyl	58%	30-115
2,4,6-Tribromophenol	66%	19-122
Terphenyl-d14	90%	18-137

Target Analytes	Concentration (ppm)
bis(2-Chloroethyl)ether	ND<0.100
Phenol	ND<0.100
2-Chlorophenol	ND<0.100
1,3-Dichlorobenzene	ND<0.100
1,4-Dichlorobenzene	ND<0.100
1,2-Dichlorobenzene	ND<0.100
Benzyl alcohol	ND<0.100
bis(2-chloroisopropyl)ether	ND<0.100
2-Methylphenol	ND<0.100
Hexachloroethane	ND<0.100
N-Nitroso-di-n-propylamine	ND<0.100
4-Methylphenol	ND<0.100
Nitrobenzene	ND<0.100
Isophorone	ND<0.100
2-Nitrophenol	ND<0.100
2,4-Dimethylphenol	ND<0.100
bis(2-Chloroethoxy)methane	ND<0.100
2,4-Dichlorophenol	ND<0.100
1,2,4-Trichlorobenzene	ND<0.100
Naphthalene	0.142
4-Chloroaniline	ND<0.100
Hexachlorobutadiene	ND<0.100
4-Chloro-3-methylphenol	ND<0.100
2-Methylnaphthalene	0.192
Hexachlorocyclopentadiene	ND<0.100
2,4,6-Trichlorophenol	ND<0.100
2,4,5-Trichlorophenol	ND<0.100

(continued)

Sample #: West Pac - Stockpile Dupli (page 2)

2-Chloronaphthalene	ND<0.100
2-Nitroaniline	ND<0.100
Acenaphthylene	ND<0.100
Dimethylphthalate	ND<0.100
2,6-Dinitrotoluene	ND<0.100
Acenaphthene	ND<0.100
3-Nitroaniline	ND<0.100
2,4-Dinitrophenol	ND<0.100
Dibenzofuran	ND<0.100
2,4-Dinitrotoluene	ND<0.100
4-Nitrophenol	ND<0.100
Fluorene	ND<0.100
4-Chlorophenyl-phenylether	ND<0.100
Diethylphthalate	ND<0.100
4-Nitroaniline	ND<0.100
4,6-Dinitro-2-methylphenol	ND<0.100
n-Nitrosodiphenylamine	ND<0.100
4-Bromophenyl-phenylether	ND<0.100
Hexachlorobenzene	ND<0.100
Pentachlorophenol	ND<0.100
Phenanthrene	ND<0.100
Anthracene	ND<0.100
Di-n-butylphthalate	ND<0.100
Fluoranthene	ND<0.100
Pyrene	ND<0.100
Butylbenzylphthalate	ND<0.100
3,3'-Dichlorobenzidine	ND<0.100
Benzo[a]anthracene	ND<0.100
Chrysene	ND<0.100
bis(2-Ethylhexyl)phthalate	0.377
Di-n-octylphthalate	ND<0.100
Benzo[b]fluoranthene	ND<0.100
Benzo[k]fluoranthene	ND<0.100
Benzo[a]pyrene	ND<0.100
Indeno[1,2,3-cd]pyrene	ND<0.100
Dibenz[a,h]anthracene	ND<0.100
Benzo[g,h,i]perylene	ND<0.100

Sample #: **Method Blank**

Method:	EPA 8270	**AASI#:**	Method Blank
Analyst:	Mark Z Perin	**Data File:**	C:\HPCHEM\1\DATA\06-30-94\ 0401005.D
Matrix:	Blank	**Instrument:**	GCMS2
Sample (g):	5	**Extraction:**	06/30/94
Extract (ml):	1	**Analysis:**	06/30/94

Surrogates	Recovery	Limits
2-Fluorophenol	108%	25-125
Phenol-d5	70%	24-113
Nitrobenzene-d5	120%	23-120
2-Fluorobiphenyl	92%	30-115
2,4,6-Tribromophenol	30%	19-122
Terphenyl-d14	117%	18-137

Target Analytes	Concentration (ppm)
bis(2-Chloroethyl)ether	ND<0.100
Phenol	ND<0.100
2-Chlorophenol	ND<0.100
1,3-Dichlorobenzene	ND<0.100
1,4-Dichlorobenzene	ND<0.100
1,2-Dichlorobenzene	ND<0.100
Benzyl alcohol	ND<0.100
bis(2-chloroisopropyl)ether	ND<0.100
2-Methylphenol	ND<0.100
Hexachloroethane	ND<0.100
N-Nitroso-di-n-propylamine	ND<0.100
4-Methylphenol	ND<0.100
Nitrobenzene	ND<0.100
Isophorone	ND<0.100
2-Nitrophenol	ND<0.100
2,4-Dimethylphenol	ND<0.100
bis(2-Chloroethoxy)methane	ND<0.100
2,4-Dichlorophenol	ND<0.100
1,2,4-Trichlorobenzene	ND<0.100
Naphthalene	ND<0.100
4-Chloroaniline	ND<0.100
Hexachlorobutadiene	ND<0.100
4-Chloro-3-methylphenol	ND<0.100
2-Methylnaphthalene	ND<0.100
Hexachlorocyclopentadiene	ND<0.100
2,4,6-Trichlorophenol	ND<0.100
2,4,5-Trichlorophenol	ND<0.100

(continued)

Sample #: Method Blank (page 2)

2-Chloronaphthalene	ND<0.100
2-Nitroaniline	ND<0.100
Acenaphthylene	ND<0.100
Dimethylphthalate	ND<0.100
2,6-Dinitrotoluene	ND<0.100
Acenaphthene	ND<0.100
3-Nitroaniline	ND<0.100
2,4-Dinitrophenol	ND<0.100
Dibenzofuran	ND<0.100
2,4-Dinitrotoluene	ND<0.100
4-Nitrophenol	ND<0.100
Fluorene	ND<0.100
4-Chlorophenyl-phenylether	ND<0.100
Diethylphthalate	ND<0.100
4-Nitroaniline	ND<0.100
4,6-Dinitro-2-methylphenol	ND<0.100
n-Nitrosodiphenylamine	ND<0.100
4-Bromophenyl-phenylether	ND<0.100
Hexachlorobenzene	ND<0.100
Pentachlorophenol	ND<0.100
Phenanthrene	ND<0.100
Anthracene	ND<0.100
Di-n-butylphthalate	ND<0.100
Fluoranthene	ND<0.100
Pyrene	ND<0.100
Butylbenzylphthalate	ND<0.100
3,3'-Dichlorobenzidine	ND<0.100
Benzo[a]anthracene	ND<0.100
Chrysene	ND<0.100
bis(2-Ethylhexyl)phthalate	ND<0.100
Di-n-octylphthalate	ND<0.100
Benzo[b]fluoranthene	ND<0.100
Benzo[k]fluoranthene	ND<0.100
Benzo[a]pyrene	ND<0.100
Indeno[1,2,3-cd]pyrene	ND<0.100
Dibenz[a,h]anthracene	ND<0.100
Benzo[g,h,i]perylene	ND<0.100