0050456

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

066043

FEB 10 1999

Mr. Douglas R. Sherwood
Hanford Project Manager
U.S. Environmental Protection Agency
712 Swift Boulevard, Suite 5
Richland, Washington 99352

Best Available Copy

Dear Mr. Sherwood:

BENCH SCALE TEST RESULTS FOR LEAD-CONTAMINATED SOIL FROM THE 300 AREA

50442

The Stabilization Plan for the 300 Area Lead Contaminated Soil, RFS-ERDF-007, Rev. 0 (previously transmitted to you) required a bench scale test to determine the adequacy of the proposed reagents and the proper amount of set-up time required to achieve a sufficient reduction in leachable lead in the soil. Attached is the report on the results of the bench scale test for the your review and approval. The report concludes that the addition of 30 percent cement to the soil is more than adequate to gain the necessary reduction in leachable lead at the point that the mixture can pass the paint filter test. Approval from the U.S. Environmental Protection Agency (EPA) to proceed with soil stabilization using 30 percent cement is requested by February 16, 1999. In order to expedite the process, we have provided an approval signature block below. Upon receipt of EPA approval, treatment of the lead contaminated soils will commence.

If you have any questions please contact me on (509) 373-6295. Thank you for your immediate attention to this matter.

Sincerely,

Clem Robertson

O. C. Robertson, Senior Project Manager
Remedial Actions Project

MAR 1999
RECEIVED
EDMC

Attachment

cc w/attach:
D. R. Einan, EPA
P. S. Innis, EPA

cc w/o attach:
V. R. Dronen, BHI
G. B. Mitchem, BHI

Approval: _____
David R. Einan, EPA 300 Area Project Manager

The results of the bench scale test using fly ash as the stabilization agent indicate that fly ash cannot be used for the stabilization of the 300 Area soils. Sample results show that the fly ash did not reduce the amount of leachable lead in the soil and may, in fact, have contributed to an increase of leachable lead in the sample matrix. The duplicate sample did show a reduction in leachable lead levels, but this reduction is considered insufficient for full-scale stabilization of the soil.

The laboratory's Analytical Summary Report identified cadmium within two of the bench scale test samples at levels above the LDR limit of 1.0 ppm. Cadmium was reported in the baseline soil matrix at 1.31 ppm and in one of the soil/fly ash samples at 1.2 ppm. The January 1998 sampling event identified cadmium in several data packages at levels below the regulatory limit. Stabilization reagents for cadmium include Portland cement as one of the primary reagents. The laboratory provided TCLP results for cadmium for the soil/Portland cement samples. The results indicate a reduction of 156:1 (0.0084ppm:1.31 ppm) of leachable cadmium levels within the stabilized matrix. Therefore, performing stabilization of the soil with Portland cement will also have an effect on the low levels of cadmium in the soil.

Conclusion:

The full-scale stabilization project can proceed utilizing the tested mix ratio of Portland cement, water and soil. The tested mix ratio is capable of stabilizing the leachable lead within the 300 Area contaminated soil. The bench scale test results also indicate that waste can be disposed immediately after the mixing of materials is completed.

WSCF
ANALYTICAL LABORATORY REPORT

for

PROJECT HANFORD MANAGEMENT CONTRACTORS
RICHLAND WA 99352

Attention: GAGNON,P.A.373-4379

Report#: 99000073
Report Date: 2-feb-1999
Report W004/ver. 3
PROJECT HANFORD MANAGEMENT CONTRACTORS

Revised Report- Customer added Cd Results to requested analyses.
BMC 2/1/99

WSCF
ANALYTICAL LABORATORY REPORT

Attention: GAGNON,P.A.373-4379 **Group #:** 99000073
Project Number MISC. :PROJ. HANFORD MNGMT. CONT.

Sample #	Client ID		Test Performed	Matrix	Method	RQ	Result	Units	MDL	Analyzed	Sampled	Received
W99000037	S8152 01		Lead by ICP-MS	WATER	EPA 200.8		2300.	ug/L	2.40	01/28/99	01/19/99	01/19/99
W99000037	S8152 01		TCLP Extraction	WATER	EPA 1311		1/21/99		0.00	01/21/99	01/19/99	01/19/99
W99000038	S8152 02		Cadmium by ICP-MS	WATER	EPA 200.8		9.1	ug/L	2.40	01/28/99	01/19/99	01/19/99
W99000038	S8152-02		Lead by ICP-MS	WATER	EPA 200.8		8.35	ug/L	2.40	01/28/99	01/19/99	01/19/99
W99000038	S8152 02		TCLP Extraction	WATER	EPA 1311		1/21/99		0.00	01/21/99	01/19/99	01/19/99
W99000039	S8152 03		Cadmium by ICP-MS	WATER	EPA 200.8		5.7	ug/L	2.40	01/28/99	01/19/99	01/19/99
W99000039	S8152 03		Lead by ICP-MS	WATER	EPA 200.8	U <	2.40	ug/L	2.40	01/28/99	01/19/99	01/19/99
W99000039	S8152 03		TCLP Extraction	WATER	EPA 1311		1/21/99		0.00	01/21/99	01/19/99	01/19/99
W99000040	S8152 04		Lead by ICP-MS	WATER	EPA 200.8		2800.	ug/L	2.40	01/28/99	01/19/99	01/19/99
W99000040	S8152 04		TCLP Extraction	WATER	EPA 1311		1/21/99		0.00	01/21/99	01/19/99	01/19/99
W99000041	S8152 05		Lead by ICP-MS	WATER	EPA 200.8		7090.	ug/L	2.40	01/28/99	01/19/99	01/19/99
W99000041	S8152 05		TCLP Extraction	WATER	EPA 1311		1/21/99		0.00	01/21/99	01/19/99	01/19/99
W99000042	S8152 06		Lead by ICP-MS	WATER	EPA 200.8		1740.	ug/L	2.40	01/28/99	01/19/99	01/19/99
W99000042	S8152 06		TCLP Extraction	WATER	EPA 1311		1/21/99		0.00	01/21/99	01/19/99	01/19/99
W99000043	S8152 01	SED	Lead by ICP	SOLID	EPA 6010A		646.	ug/g	3.21	01/29/99	01/19/99	01/19/99

MDL = Minimum Detection Limit
RQ = Result Qualifier

B - The analyte was detected in the associated method blank.
D - Compound concentration resulted from a dilution.
E - Compound concentration exceeded calibration range.
J - Estimated value.
Z - See Comments.
N - Identification is based on a mass spectral library search.
U - The analyte was analyzed for but not detected.

* Indicates results that have NOT been validated.

WSCF
ANALYTICAL COMMENT REPORT

Attention: GAGNON,P.A.373-4379 **Group #:** 99000073
Project Number MISC.

Sample #	Client ID	Lab Area	Test	Comment
W99000037	S8152-01	TESTDATA	Lead by ICP-MS	Sample W99-37 contains 1310 ug/L (ppb) or 1.31 ug/mL (ppm) cadmium. This exceeds the TCLP requirements (1 ppm).
W99000041	S8152-05	TESTDATA	Lead by ICP-MS	Sample W99-41 exceeds TCLP limits (5 ppm).
W99000042	S8152-06	TESTDATA	Lead by ICP-MS	Sample W99-42 contains 1200 ug/L (ppb) or 1.20 ug/mL (ppm) cadmium. This exceeds TCLP requirements (1 ppm).

Lab Areas: VALGROUP - Group Validation; LOGSAMP - Login for Sample; VALTEST - Test Validation; LOGTEST - Login for Tests; TESTDATA - Test Data Entry

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WSCF
TENTATIVELY IDENTIFIED PEAK REPORT

Attention:
Project Number :

Group #: 99000073

Sample #	Client ID	Test Name	Peak Name	CAS#	RT	RQ	Result	Units

RQ=Result Qualifier
ND=Not Detected

B - The analyte was detected in the associated method blank.
N - Identification is based on a mass spectral library search.
J - Estimated value.
U - The analyte was analyzed for but not detected.

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Waste Management Northwest	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C # 101507
		Page 1 of 2

Collector HOGAN, J.G.	Contact/Requestor GAGNON, P.A.	Tel. No. 373-4379 MSIN FAX
SAF Number S8-152	Sample Origin 300 AREA	Purchase Order/Charge Code
Project Title ERDF Lead Stabilization	Logbook # WM-SML-H17	Ice Chest # Temp.
Shipped To (Lab) WSCF	Method of Shipment GOVT. TRUCK	Bill of Lading/Air Bill No. N/A
Protocol RCRA	Data Turnaround 14 Days	Offsite Property No. N/A

Sample No.	Lab. ID	*	Date	Time	No/Type Container	Sample Analysis	Perservative
S8152-01		S	1/19/99	0835	(1) 20 P	Rad Screen (Lab specific)	None
S8152-01		S	1/19/99	0835	(1) 2000 P	TCLP (1311 & 200.8) Lead	Cool 4 deg C
S8152-01		S	1/19/99	0835	(1) 60 aG	Total Lead (6010)	HNO3
S8152-02		X	1/19/99	0845	(1) 20 P	Rad Screen (Lab specific)	None
S8152-02		X	1/19/99	0845	(1) 2000 P	TCLP (1311 & 200.8) Lead	Cool 4 deg C.
S8152-03		X	1/19/99	0909	(1) 20 P	Rad Screen (Lab specific)	None
S8152-03		X	1/19/99	0909	(1) 2000 P	TCLP (1311 & 200.8) Lead	Cool 4 deg. C.
S8152-04		X	1/19/99	0925	(1) 20 P	Rad Screen (Lab specific)	None
S8152-04		X	1/19/99	0925	(1) 2000 P	TCLP (1311 & 200.8) Lead	Cool 4 deg. C.
S8152-05		X	1/19/99	0940	(1) 20 P	Rad Screen (Lab specific)	None
S8152-05		X	1/19/99	0940	(1) 2000 P	TCLP (1311 & 200.8) Lead	Cool 4 deg C.
S8152-06		X	1/19/99	0925	(1) 20 P	Rad Screen (Lab specific)	None

POSSIBLE SAMPLE HAZARDS/REMARKS MSDS Yes No
List all known wastes.

SPECIAL INSTRUCTIONS Hold Time

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
SG Hogan		JG Hogan	1-19-99/1030	Victor	Sims	[signature]	1/19/99 1030
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION Disposal Method e.g. Return to customer, per lab procedure, used in process Disposed By Date/Time

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin

A 6001 500 (07/95)

Waste Management Northwest	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C # 101507
		Page 2 of 2

Collector HOGAN, J.G.	Contact/Requestor GAGNON, P.A.	Tel. No. 373-4379 MSIN FAX
SAF Number S8-152	Sample Origin 300 AREA	Purchase Order/Charge Code
Project Title ERDF Lead Stabilization	Logbook # WM-SML-H17	Ice Chest # Temp.
Shipped To (Lab) WSCF	Method of Shipment GOVT. TRUCK	Bill of Lading/Air Bill No. N/A
Protocol RCRA	Data Turnaround 14 Days	Offsite Property No. N/A

Sample No.	Lab. ID	*	Date	Time	No/Type Container	Sample Analysis	Perservative
S8152-06		X	1/19/99	0925	(1) 2000 P	TCLP (1311 & 200.8) Lead	Cool 4 deg. C.

POSSIBLE SAMPLE HAZARDS/REMARKS MSDS Yes ☐ No ☐
List all known wastes.

SPECIAL INSTRUCTIONS Hold Time

Relinquished By Print	Sign	Date/Time	Received By Print	Sign	Date/Time
J.G. Hogan	J.G. Hogan	1-19-99/1030	Victor Sims	[illegible]	1/19/99 10:30
Relinquished By		Date/Time	Received By		Date/Time
Relinquished By		Date/Time	Received By		Date/Time
Relinquished By		Date/Time	Received By		Date/Time

Matrix *

S = Soil		DS = Drum Solids	
SE = Sediment		DL = Drum Liquids	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wipe	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION: Disposal Method e.g. Return to customer, per lab procedure, used in process. Disposed By Date/Time

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin

A 6001 500 (07/95)

Method 1311 (pH of samples for TCLP analysis)

Stabilization Material	Mix Ratio (SM:W)	pH (5 g MR + 96.5 ml H2O)	pH (+3.5 ml 1N HCL)
SOIL	100 g + 10ml H2O	8.01	2.2
FLY ASH	40 g F.A. + 100 g Soil + 10ml H2O	11.61	8.33
CEMENT	30 g C. + 100 g Soil + 10ml H2O	12.00	10.7

Calibration Data:

HACH pH meter: 940700025050 Digital Thermometer: 295089

pH = 7.00/25. deg. C
pH = 10.00/25. deg. C

Buffer: pH 7 Lot # 981844-24 exp.date: Aug. 2000

pH 10 Lot # 981162-24 exp.date: March 2000

SAF # **S8-152** Event #: **1**

Project Name: **ERDF Lead Stabilization**

Date **1/19/99**

Sample Point: **Cement**

Lead Sampler: **HOGAN, J.G.**

Sample Matrix: **OTHER**

Field Screening Results:

Sample ID / Cust ID	Blank T/F/E	Analysis Parameters / Sub Analysis	Preservative(s)	Container	Serial # / Lot #	Date / Time	E#/R	COC#	Laboratory	IC #
S8152-02	N/A	Rad Screen (Lab specific) /	None	20 mL P		1/19/99 0845		101507	WSCF	
S8152-02	N/A	TCLP (1311 & 200.8) Lead /	Cool 4 deg. C.	2000 mL P		1/19/99 0845		101507	WSCF	

SAF # **S8-152** Event # **1**

Field Screening Results:

Project Name: **ERDF Lead Stabilization**

Date **1/19/99**

Sample Point: **Cement (> 20 min.)**

Lead Sampler **HOGAN, J.G.**

Sample Matrix: **OTHER**

Sample ID / Cust ID	Blank T/F/E	Analysis Parameters / Sub Analysis	Preservative(s)	Container	Serial # / Lot #	Date / Time	E#/R	COC#	Laboratory	IC #
S8152-03	N/A	Rad Screen (Lab specific) /	None	20 mL P		1/19/99 0909		101507	WSCF	
S8152-03	N/A	TCLP (1311 & 200 8) Lead /	Cool 4 deg. C.	2000 mL P		1/19/99 0909		101507	WSCF	

SAF #: **S8-152** Event #: **1**

Field Screening Results:

Project Name: **ERDF Lead Stabilization**

Date: **1/19/99**

Sample Point: **Fly Ash**

Lead Sampler: **HOGAN, J.G.**

Sample Matrix: **OTHER**

Sample ID / Cust ID	Blank T/F/E	Analysis Parameters / Sub Analysis	Preservative(s)	Container	Serial # / Lot #	Date / Time	E#/R	COC#	Laboratory	IC #
S8152-04	N/A	Rad Screen (Lab specific) /	None	20 mL P		1/19/99 0925		101507	WSCF	
152-04	N/A	TCLP (1311 & 200 8) Lead /	Cool 4 deg. C.	2000 mL P		1/19/99 0925		101507	WSCF	

SAF # **S8-152** Event #: **1**

Project Name: **ERDF Lead Stabilization**

Date **1/19/99**

Sample Point: **Fly Ash (>20 min.)**

Lead Sampler: **HOGAN, J.G.**

Sample Matrix: **OTHER**

Field Screening Results:

Sample ID / Cust ID	Blank T/F/E	Analysis Parameters / Sub Analysis	Preservative(s)	Container	Serial # / Lot #	Date / Time	E#/R	COC#	Laboratory	IC #
8152-05	N/A	Rad Screen (Lab specific) /	None	20 mL P		1/19/99 0940		101507	WSCF	
152-05	N/A	TCLP (1311 & 200 8) Lead /	Cool 4 deg. C.	2000 mL P		1/19/99 0940		101507	WSCF	

SAF #: **S8-152** Event #: **1**

Project Name: **ERDF Lead Stabilization**

Date **1/19/99**

Sample Point: **Fly Ash (Duplicate)**

Lead Sampler: **HOGAN, J.G.**

Sample Matrix: **OTHER**

Field Screening Results:

Sample ID / Test ID	Blank T/F/E	Analysis Parameters / Sub Analysis	Preservative(s)	Container	Serial # / Lot #	Date / Time	E#/R	COC#	Laboratory	IC #
152-06	N/A	Rad Screen (Lab specific) /	None	20 mL P		1/19/99 0925		101507	WSCF	
152-06	N/A	TCLP (1311 & 200 8) Lead /	Cool 4 deg. C.	2000 mL P		1/19/99 0925		101507	WSCF	

SAF # **S8-152** Event #: **1**

Project Name: **ERDF Lead Stabilization**

Date **1/19/99**

Sample Point: **Soil**

Lead Sampler **HOGAN, J.G.**

Sample Matrix: **SOIL**

Field Screening Results:

Sample ID / LID	Blank T/F/E	Analysis Parameters / Sub Analysis	Preservative(s)	Container	Serial # / Lot #	Date / Time	E#/R	COC#	Laboratory	IC #
52-01	N/A	Rad Screen (Lab specific) /	None	20 mL P		1/19/99 0835		101507	WSCF	
52-01	N/A	TCLP (1311 & 200.8) Lead /	Cool 4 deg. C.	2000 mL P		1/19/99 0835		101507	WSCF	
S8152-01	N/A	Total Lead (6010) /	HNO3	60 mL aG		1/19/99 0835		101507	WSCF	