A Report Prepared for

East Bay Municipal Utility District
Special District No. 1
P.O. Box 24055
Oakland, California 94623

EBMUD

REPORT OF SYSTEM MONITORING: MARCH 12 - 15, 1988
DEWATERING EFFLUENT TREATMENT SYSTEM
CHINATOWN REDEVELOPMENT PROJECT AREA
OAKLAND, CALIFORNIA

3/18/88

HLA Job No. 9382,018.02

Submitted on behalf of:

City of Oakland Redevelopment Agency
One City Hall Plaza
Oakland, California 94612

by

David F. Leland
Senior Hydrologist

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415/892-0821

March 18, 1988

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I INTRODUCTION

This report describes the startup of the dewatering effluent treatment system installed at 10th and Webster streets, Oakland, California, and presents the results of initial monitoring of the system. The system is treating water produced during ground-water dewatering of the block bounded by 10th, 11th, and Webster, and Franklin streets in conjunction with excavation and construction in progress at the site. The system is designed to remove petroleum hydrocarbons from dewatering effluent prior to its discharge to the sanitary sewer. Investigations associated with underground tank removal at the site identified petroleum hydrocarbons in the ground water.

This report has been prepared by Harding Lawson Associates (HLA) and is submitted in compliance with the Temporary Wastewater Discharge Permit issued by the East Bay Municipal Utility District (EBMUD) to the City of Oakland Redevelopment Agency (Agency) in response to the Agency's Wastewater Discharge Permit Application dated February 1, 1988.

Also included in this report are the results of analyses of samples collected in and around two vaults discovered at the site during excavation, and a brief discussion of the disposal of materials related to these vaults.

II TREATMENT SYSTEM STARTUP AND OPERATIONS

The dewatering effluent treatment system was installed at the site on March 8, 1988, and has been in continuous operation since March 14, 1988. The following is a chronology of major events that occurred during the startup period, March 8 to March 13.

March 8: The effluent treatment system was installed at the site. System startup included backwashing the carbon filters to remove fines and leak testing. Backwashing was not completed due to minor leaks from pipe fittings and carbon filter seals. The backwashing effluent city water was discharged to the Baker tanks located adjacent to the treatment tanks. Four Baker tanks with a total capacity of 84,000 gallons are currently in place at the site.

March 9-10: All leaks were repaired and backwashing was completed. Butyl rubber seals were installed to stop leaks from carbon filters. A diesel generator supplied power. City water was discharged into the storage tank on the treatment system trailer to start pump testing and calibration of control instruments. All system control instruments were calibrated. A few leaks from pipe fittings and carbon filters appeared when the flow exceeded 50 gpm.

March 11: All leaks from pipe fittings were repaired. Pump testing was completed and no additional leaks were found. The complete system was put into continuous operation using city water. The effluent (city water) was discharged into the sanitary sewer. Dewatering well water was used to test the system control logic. Treated dewatering well effluent was first discharged to the sanitary sewer at 5:25 p.m. The system was shut down in the evening.

March 12: A vacuum breaker was installed on every carbon filter outlet pipe. The complete system was tested successfully and put into continuous operation to start treating well water. However, the power generator failed. A replacement generator was installed at 8:00 p.m., and the system operated overnight. The first set of samples was collected to evaluate system performance and discharge water quality.

March 13: The treatment system operated continuously until the second generator failed. A third power generator was called into service. Daily monitoring samples were collected. EBMUD personnel collected a duplicate sample of treatment system effluent for parallel analysis.

March 14: The treatment system was treating dewatering well water at a rate of approximately 55 gpm. PG&E power was connected to the treatment system. Daily monitoring samples were taken.

March 15: Daily monitoring samples were collected.

III TREATMENT SYSTEM MONITORING

A. Sample Collection and Analysis

Samples of treatment system water were collected daily from influent, intermediate, and effluent sampling ports between system startup on March 12 and March 15. Quality Assurance/Quality Control samples consisting of field blanks and duplicates of effluent samples were also collected. A duplicate sample of effluent water was collected by EBMUD personnel on Monday, March 14, 1988.

All treatment system samples collected during this period have been analyzed for total petroleum hydrocarbons (TPH) as gasoline and diesel by EPA Test Method 8015 and for volatile organic compounds by EPA Test Method 602. Effluent samples, field blanks, and the initial round of influent samples have also been analyzed for organic priority pollutants by EPA Test Methods 624 and 625. The effluent sample collected March 12 is being analyzed for priority pollutant metals, total suspended solids (TSS), and chemical oxygen demand (COD).

Results of analyses completed to date are summarized in Tables 1 through 3. These results are based on verbal reports from WESCO Laboratories, Novato, California, and are subject to revision pending receipt of written reports, which will be included in an appendix to a subsequent treatment system monitoring report.

B. Discharge Limit Exceedences

There were no exceedences of permitted effluent discharge limits during this reporting period.

IV ACTIVITIES PLANNED: MARCH 16 THROUGH 31, 1988

The following improvements to the operation and monitoring of the treatment system are planned for the period March 16 through 31, 1988.

- Reconfiguration of the effluent flow meter. The current configuration does not permit reliable measurement of total flow because the meter sensors are not completely immersed in the effluent stream.

- Modification to sampling port spigots in order to reduce the potential for aeration of samples during collection. It is planned to modify the port spigots with a nipple and extension tubing.

V HAZARDOUS WASTE SHIPMENTS

During the early stages of site excavation, two vaults of unknown origin were unearthed. Samples of the oily material in these vaults and soils associated with the vaults were collected and submitted to WESCO Laboratories for analysis. Because high TPH and lead concentrations were detected in the samples, these materials were considered hazardous; the chemical data sheets for analyzed samples are included in Appendix A. The materials were placed in bins. Several bins were removed from the site March 16 and 17, 1988, and transported to the Chemical Waste Management facility in Kettleman City, California, a Class I disposal facility. The total volume of hazardous materials removed from the site to date is approximately 20 yd^3.

No other hazardous wastes have been removed from the site.

TABLES

Table 1. Treatment System Water Analysis: Influent Samples

Harding Lawson Associates

Date	12-Mar-88	13-Mar-88	14-Mar-88	15-Mar-88
HLA Sample ID#	88101101	88111301	88111401	88111501
Test Method Compounds				
EPA 602				
Benzene	385	136	320	340
Toluene	172	93	240	230
Ethylbenzene	53	37	46	6
Xylene	379	110	330	160
All Other 602 Compounds	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
TPH				
Gasoline	3,750	2,760	4,000	1,400
Diesel	ND(10,000)	ND(10,000)	ND(10,000)	ND(1,000)
EPA 624		NT	NT	NT
1,2-Dichloroethane	30			
Benzene	510			
Trichloroethene	33			
Toluene	320			
Chlorobenzene	14			
Ethylbenzene	21			
All Other 624 Compounds	ND			
EPA 625		NT	NT	NT
Naphthalene	11.7			
2-Methylphenol	3.2			
All Other 625 Compounds	ND			

ND - Not detected (detection limit in parenthesis).

NT - Not tested.

All analyses reported in parts per billion (ppb).

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Table 2. Treatment System Water Analysis: Intermediate Samples

Date	12-Mar-88	13-Mar-88	14-Mar-88	15-Mar-88
HLA Sample ID#	88101102	88101302	88101402	88101502
Test Method Compounds				
EPA 602				
Benzene	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Toluene	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Ethylbenzene	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Xylene	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
All Other 602 Compounds	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
TPH				
Gasoline	ND(50)	ND(50)	ND(50)	ND(50)
Diesel	ND(10,000)	ND(10,000)	ND(1,000)	ND(10,000)

ND - Not detected (detection limit in parenthesis).

All analyses reported in parts per billion (ppb).

Table 3. Treatment System Water Analysis: Effluent Samples

Date	12-Mar-88	12-Mar-88	13-Mar-88	14-Mar-88	15-Mar-88
HLA Sample ID#	88101103	88101104	88111303	88111403	88111503
Test Method Compounds					
EPA 602					
Benzene	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Toluene	2.1	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Ethylbenzene	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Xylene	2.5	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
TPH					
Gasoline	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
Diesel	ND(10,000)	ND(10,000)	ND(10,000)	ND(10,000)	ND(10,000)
EPA 624					
All Compounds	ND	ND	ND	ND	ND
EPA 625					
All Compounds	ND	ND	ND	ND	ND

ND - Not detected (detection limit in parenthesis).

All analyses reported in parts per billion (ppb).

Appendix A

LABORATORY ANALYTICAL RESULTS FOR HAZARDOUS WASTE MATERIALS

Vault 1

WESCO Laboratories

Report Date:	01-Mar-88	Client Contract/PO:	9382,019.02
Client:	Harding Lawson Associates	Date Sampled:	11-Feb-88
Attn:	Dave Leland	Site:	Oakland Chinatown
Sampled by:	W. Godwin	Date Received:	11-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge Date:	11-Feb-88
Preservatives:	none		
Analyst:	Arntzen	Analysis Completion Date:	11-Feb-88
WESCO JOB #:	HLA 0816-L		
Analytical Method:	EPA 8020	Hold Time:	0 days

LAB #: 8-1660 MATRIX: SOIL
CLIENT'S ID: 88061101

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	2800	500
Toluene	1400	500
Chlorobenzene	N.D.	500
Ethylbenzene	*	500
Xylene	2700	500
1,3-Dichlorobenzene	N.D.	500
1,4-Dichlorobenzene	N.D.	500
1,2-Dichlorobenzene	N.D.	500

QUALITY CONTROL DATA

Surrogate Spike	Percent Recovery
Fluorobenzene	63 %

LAB #: 8-1661 MATRIX: SOIL
CLIENT'S ID: 88061101

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	10000	1000
Toluene	1700	1000
Chlorobenzene	N.D.	1000
Ethylbenzene	*	1000
Xylene	85000	1000
1,3-Dichlorobenzene	N.D.	1000
1,4-Dichlorobenzene	N.D.	1000
1,2-Dichlorobenzene	N.D.	1000

QUALITY CONTROL DATA

Surrogate Spike	Percent Recovery
Fluorobenzene	78 %

* : Ethylbenzene possibly combined with xylene.
N.D.: Not Detected

Doug Drum for Attalla
Analytical Supervisor

14 Galli Drive, Suite A
Novato, California 94949 415 883-6425
A Division of Western Ecological Services Company, Inc.

BLANK, SPIKE DUPLICATE AND SPIKE REPORT FOR JOB # HLA 0816-L
METHOD: EPA 8020

COMPOUND	Blank (ug/l)	Spike Duplicate % deviation	Spike % recovery
Job #		ACB 0801-L	ACB 0801-L
Benzene	N.D.	3	94
Toluene	N.D.	1	94
p-Xylene	N.D.	21	96
QUALITY CONTROL DATA			
Surrogate Spike % Recovery			
Bromofluorobenzene	103 %	95 %	100 %

N.D.: Not Detected

Analytical Supervisor

Report Date:	01-Mar-88	Client Contract/PO:	9382,019.02
Client:	Harding Lawson Associates	Date Sampled:	11-Feb-88
Attn:	Dave Leland	Site:	Oakland Chinatown
Sampled by:	W. Godwin	Date Received:	11-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge Date:	11-Feb-88
Preservatives:	none		
Analyst:	Arntzen	Analysis Completion Date:	11-Feb-88
WESCO JOB #:	HLA 0816-L		
Analytical Method:	EPA 8010	Hold time:	0 days

LAB #: 8-1660 MATRIX: SOIL
CLIENT'S ID: 88061101

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Dichlorodifluoromethane	N.D.	5000
Chloromethane	N.D.	5000
Vinyl Chloride	N.D.	5000
Bromomethane	N.D.	5000
Chloroethane	N.D.	5000
Trichlorofluoromethane	N.D.	5000
1,1-Dichloroethene	N.D.	1250
Methylene Chloride	2500	1250
trans-1,2-Dichloroethene	N.D.	1250
1,1-Dichloroethane	N.D.	1250
Chloroform	N.D.	1250
1,1,1-Trichloroethane (TCA)	N.D.	1250
Carbon Tetrachloride	N.D.	1250
1,2-Dichloroethane (EDC)	N.D.	1250
Trichloroethene (TCE)	N.D.	1250
1,2-Dichloropropane	N.D.	1250
Bromodichloromethane	N.D.	1250
2-Chloroethylvinyl ether	N.D.	1250
trans-1,3-Dichloropropene	N.D.	1250
cis-1,3-Dichloropropene	N.D.	1250
1,1,2-Trichloroethane	N.D.	1250
Tetrachloroethene	N.D.	1250
Dibromochloromethane	N.D.	1250
Chlorobenzene	N.D.	1250
Bromoform	N.D.	1250
1,1,2,2-Tetrachloroethane	N.D.	1250
1,3-Dichlorobenzene	N.D.	1250
1,4-Dichlorobenzene	N.D.	1250
1,2-Dichlorobenzene	N.D.	1250

QUALITY CONTROL DATA

Surrogate Spike	Percent Recovery
Bromochloromethane	91 %
1,4-Dichlorobutane	104 %

N.D.: Not Detected

Doug Drang for Attalla
Analytical Supervisor

Report Date:	01-Mar-88	Client Contract/PO:	9382,019.02
Client:	Harding Lawson Associates	Date Sampled:	11-Feb-88
Attn:	Dave Leland	Site:	Oakland Chinatown
Sampled by:	W. Godwin	Date Received:	11-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge	
Preservatives:	none	Date:	11-Feb-88
Analyst:	Arntzen	Analysis Completion	
WESCO JOB #:	HLA 0816-L	Date:	11-Feb-88
Analytical Method:	EPA 8010	Hold time:	0 days

LAB #: 8-1661 MATRIX: SOIL
CLIENT'S ID: 88061102

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Dichlorodifluoromethane	N.D.	10000
Chloromethane	N.D.	10000
Vinyl Chloride	N.D.	10000
Bromomethane	N.D.	10000
Chloroethane	N.D.	10000
Trichlorofluoromethane	N.D.	10000
1,1-Dichloroethene	3200	2500
Methylene Chloride	N.D.	2500
trans-1,2-Dichloroethene	N.D.	2500
1,1-Dichloroethane	N.D.	2500
Chloroform	N.D.	2500
1,1,1-Trichloroethane (TCA)	N.D.	2500
Carbon Tetrachloride	N.D.	2500
1,2-Dichloroethane (EDC)	N.D.	2500
Trichloroethene (TCE)	N.D.	2500
1,2-Dichloropropane	N.D.	2500
Bromodichloromethane	N.D.	2500
2-Chloroethylvinyl ether	N.D.	2500
trans-1,3-Dichloropropene	N.D.	2500
cis-1,3-Dichloropropene	N.D.	2500
1,1,2-Trichloroethane	N.D.	2500
Tetrachloroethene	N.D.	2500
Dibromochloromethane	N.D.	2500
Chlorobenzene	N.D.	2500
Bromoform	N.D.	2500
1,1,2,2-Tetrachloroethane	N.D.	2500
1,3-Dichlorobenzene	N.D.	2500
1,4-Dichlorobenzene	N.D.	2500
1,2-Dichlorobenzene	N.D.	2500

QUALITY CONTROL DATA

Surrogate Spike	Percent Recovery
Bromochloromethane	83 %
1,4-Dichlorobutane	96 %

N.D.: Not Detected

Douglas Cramer for Hatton
Analytical Supervisor

BLANK, SPIKE DUPLICATE AND SPIKE REPORT JOB # HLA 0816-L
METHOD : EPA 8010

COMPOUND	Blank (ug/l)	Spike Duplicate % deviation ACB 0801-L	Spike % recovery ACB 0801-L
Job #			
Dichlorodifluoromethane	N.D.	-	N.S.
Chloromethane	N.D.	-	N.S.
Vinyl Chloride	N.D.	-	N.S.
Bromomethane	N.D.	-	N.S.
Chloroethane	N.D.	-	N.S.
Trichlorofluoromethane	N.D.	-	N.S.
1,1-Dichloroethene	N.D.	-	N.S.
Methylene Chloride	N.D.	-	N.S.
trans-1,2-Dichloroethene	N.D.	-	N.S.
1,1-Dichloroethane	N.D.	24	91
Chloroform	N.D.	-	N.S.
1,1,1-Trichloroethane (TCA)	N.D.	-	N.S.
Carbon Tetrachloride	N.D.	-	N.S.
1,2-Dichloroethane (EDC)	N.D.	-	N.S.
Trichloroethene (TCE)	N.D.	15	100
1,2-Dichloropropane	N.D.	-	N.S.
Bromodichloromethane	N.D.	-	N.S.
2-Chloroethylvinyl ether	N.D.	-	N.S.
trans-1,3-Dichloropropene	N.D.	19	106
cis-1,3-Dichloropropene	N.D.	-	N.S.
1,1,2-Trichloroethane	N.D.	-	N.S.
Tetrachloroethene	N.D.	21	100
Dibromochloromethane	N.D.	-	N.S.
Chlorobenzene	N.D.	-	N.S.
Bromoform	N.D.	-	N.S.
1,1,2,2-Tetrachloroethane	N.D.	-	N.S.
1,3-Dichlorobenzene	N.D.	-	N.S.
1,4-Dichlorobenzene	N.D.	-	N.S.
1,2-Dichlorobenzene	N.D.	-	N.S.
QUALITY CONTROL DATA			
Surrogate Spike % recovery			
Bromochloromethane	67 %	98 %	126%
1,4-Dichlorobutane	75 %	109 %	111%

N.D.: Not Detected
N.S.: Not Spiked

Analytical Supervisor

Report Date:	01-Mar-88	Client Contract/PO:	9382,019.02
Client:	Harding Lawson Associates	Date Sampled:	11-Feb-88
Attn:	Dave Leland	Site:	Oakland Chinatown
Sampled by:	W. Godwin	Date Received:	11-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge Date:	12-Feb-88
Preservatives:	none		
Analyst:	Arntzen	Analysis Completion Date:	12-Feb-88
WESCO JOB #:	HLA 0816-L		
Analytical Method:	EPA 5030/8015	Hold Time:	1 day

LAB #: 8-1660 MATRIX: SOIL
CLIENT'S ID: 88061101

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Gasoline	140000*	50000

QUALITY CONTROL DATA
Surrogate Spike % Recovery
Fluorobenzene 90 %

LAB #: 8-1661 MATRIX: SOIL
CLIENT'S ID: 88061102

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Gasoline	2800000*	125000

QUALITY CONTROL DATA
Surrogate Spike % Recovery
Fluorobenzene 92 %

* : Diesel quantified as gasoline.
N.D.: Not Detected

Doug Gram for A Hulla
Analytical Supervisor

BLANK, SPIKE DUPLICATE AND SPIKE REPORT FOR JOB # HLA 0816-L
METHOD: EPA 5030/8015

COMPOUND Sample #	Blank ug/l	Spike Duplicate % deviation 8-1551 NCP 0810-L	Spike % recovery 8-1551 NCP 0810-L
Gasoline----------	N.D.	3	91
QUALITY CONTROL DATA Surrogate Spike % Recovery Bromofluorobenzene	102 %	99 %	100 %

N.D.: Not Detected

Note: Wesco Laboratories will store samples until 30 days after date of report unless otherwise notified.

Douglas Quan for Attalla

Analytical Supervisor

Vault 2

Report Date:	02-Mar-88	Client Contract/PO	9832,020.01
Client:	Harding Lawson Associates	Date Sampled:	17-Feb-88
Attn:	Peter Mote	Site:	Oakland, Chinatown
Sampled by:	W. Godwin	Date Received:	17-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge	
Preservatives:	none	Date:	24-Feb-88
Analyst:	Libby/Staggs	Analysis Completion	
WESCO JOB #:	HLA 0819-L	Date:	24-Feb-88
Analytical Method:	METALS	Hold Time	7 days

MATRIX: SOIL

LAB #	CLIENT ID	Antimony (Sb) (mg/kg)	Arsenic (As) (mg/kg)	Barium (Ba) (mg/kg)	Beryllium (Be) (mg/kg)	Cadmium (Cd) (mg/kg)	Chromium (Cr) (mg/kg)
8-1754	88071703	0.40	2.8	2100	N.D.	3	35.6
Detection limit		0.10	0.5	2	1	2	2.0
Method number		EPA 7041	EPA 7060	EPA 6010	EPA 6010	EPA 7130	EPA 7190

LAB #	CLIENT ID	Cobalt (Co) (mg/kg)	Copper (Cu) (mg/kg)	Lead (Pb) (mg/kg)	Mercury (Hg) (mg/kg)	Molybdenum (Mo) (mg/kg)	Nickel (Ni) (mg/kg)
8-1754	88071703	7.3	45	5221	0.2	N.D.	32
Detection limit		2.0	2	2	0.0007	0.4	2
Method number		EPA 7200	EPA 7210	EPA 7420	EPA 7470	EPA 7481	EPA 7520

LAB #	CLIENT ID	Selenium (Se) (mg/kg)	Silver (Ag) (mg/kg)	Thallium (Tl) (mg/kg)	Vanadium (V) (mg/kg)	Zinc (Zn) (mg/kg)
8-1754	88071703	N.D.	2	0.13	30.2	753
Detection limit		0.5	2	0.05	0.4	2
Method number		EPA 7740	EPA 7760	EPA 7841	EPA 7911	EPA 7950

N.D.: Not Detected

Susan Libby

Analytical Supervisor

BLANK, SPIKE DUPLICATE AND SPIKE REPORT JOB # HLA 0819-L
METHOD: METALS

COMPOUND	Blank (mg/l)	Spike Duplicate % deviation	Spike % recovery
Sample #			
Antimony	N.D.	52	13*
Arsenic	N.D.	0	112
Barium	N.D.	-	-
Beryllium	N.D.	-	-
Cadmium	N.D.	3	100
Chromium	N.D.	16	109
Cobalt	N.D.	4	99
Copper	N.D.	2	105
Lead	N.D.	2	112
Mercury (Sample #8-1660)	N.D.	24	73
Molybdenum	N.D.	33	M.I.
Nickel	N.D.	6	96
Selenium	N.D.	-	80
Silver	N.D.	14	81
Thallium	N.D.	3	30**
Vanadium	N.D.	11	78
Zinc	N.D.	2	89

N.D.: Not Detected
* : Matrix interference. DI water spike yielded 96% recovery.
** : Matrix interference. DI water spike yielded 93% recovery.

Susan Tubby
Analytical Supervisor

Composite of Vaults

WESCO Laboratories

Report Date:	01-Mar-88	Client Contract/PO:	9832,020.0
Client:	Harding Lawson Associates	Date Sampled:	11-Feb-88
Attn:	David Leland	Site:	Oakland, Chinatown
Sampled by:	W. Godwin	Date Received:	18-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge Date:	18-Feb-88
Preservatives:	none	Analysis Completion Date:	18-Feb-88
Analyst:	Oram	Hold Time:	7 days
WESCO JOB #:	HLA 0820-L		
Analytical Method:	EPA 8080		

LAB #: 8-1875 MATRIX: SOIL

CLIENT'S ID: 1101/1703 (composite)

COMPOUND	Result (ug/kg)	Detection Limit (ug/kg)
Alpha-BHC	N.D.	5
Beta-BHC	N.D.	30
Lindane	N.D.	10
Delta-BHC	N.D.	10
Heptachlor	N.D.	20
Aldrin	N.D.	15
Heptachlor Epoxide	N.D.	15
Endosulfan I	N.D.	20
DDE	N.D.	25
Dieldrin	N.D.	25
Endrin	N.D.	25
Endosulfan II	N.D.	25
4,4-DDD	N.D.	25
Endrin Aldehyde	N.D.	40
4,4-DDT	N.D.	30
Endosulfan Sulfate	N.D.	60
Aroclor 1016	N.D.	400
Aroclor 1221	N.D.	400
Aroclor 1232	N.D.	400
Aroclor 1242	N.D.	400
Aroclor 1248	N.D.	400
Aroclor 1254	N.D.	800
Aroclor 1260	N.D.	800
Chlordane	N.D.	n.d.
Toxaphene	N.D.	n.d.
Methoxychlor	N.D.	n.d.

QUALITY CONTROL DATA

Surrogate Spike % Recovery

2,4,5,6-TCMX 91 %

N.D.: Not Detected
n.d.: not determined

Doug Oram for A Hall

Analytical Supervisor

14 Galli Drive, Suite A
Novato, California 94949 415/883-6425
A Division of Western Ecological Services Company, Inc

BLANK, SPIKE DUPLICATE AND SPIKE REPORT JOB # HLA 0820-L
METHOD: EPA 8080

COMPOUND	Blank (ug/l)	Spike Duplicate % deviation	Spike % recovery
Sample #			
Lindane	N.D.	10	76
Heptachlor	N.D.	6	112
Aldrin	N.D.	12	110
Endrin	N.D.	9	121
QUALITY CONTROL DATA			
Surrogate Spike % Recovery			
2,4,5,6-TCMX	99%	105 %	98 %

N.D.: Not Detected
n.d.: not determined

Note: Wesco Laboratories will store samples until 30 days after date of report unless otherwise notified.

Doug Braun for Hallq
Analytical Supervisor

Report Date:	01-Mar-88	Client Contract/PO:	9832,020.01
Client:	Harding Lawson Associates	Date Sampled:	11-Feb-88
Attn:	David Leland	Site:	Oakland, Chinatown
Sampled by:	W. Godwin	Date Received:	18-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge Date:	24-Feb-88
Preservatives:	none		
Analyst:	Costigan	Analysis Completion Date:	24-Feb-88
WESCO JOB #:	HLA 0820-L		
Analytical Method:	Wet chemistry	Hold Time:	13 days

MATRIX: SOIL

LAB #	CLIENT ID	pH	Sulfide (SO4-) (mg/kg)	Cyanide (CN-) (mg/kg)
8-1875	1101/1703 (composite)	7.2	N.D.	N.D.
Detection limit			0.1 mg/l	0.04 mg/l
Method number			Note 1	Note 2

Note 1: APHA 1985, Method 427 B, D (Iodometric method)
Note 2: APHA 1985, Method 412 A, B, D (Colorimetric method)

QUALITY CONTROL DATA

Spike % recovery	-	92.5%
Duplicate % deviation	0%	0%

N.D.: Not Detected

Doug Crum for A Halla

Analytical Supervisor

Report Date:	01-Mar-88	Client Contract/PO:	9832,020.01
Client:	Harding Lawson Associates	Date Sampled:	11-Feb-88
Attn:	David Leland	Site:	Oakland, Chinatown
Sampled by:	W. Godwin	Date Received:	18-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge Date:	24-Feb-88
Preservatives:	none	Analysis Completion Date:	24-Feb-88
Analyst:	Siegmund		
WESCO JOB #:	HLA 0820-L		
Analytical Method:	EPA 8270	Holding Time, Days:	13 days

LAB # 8-1875 MATRIX: SOIL

CLIENT'S ID 1101/1703 (composite)

BASE NEUTRALS	RESULT (ug/l)	Detection Limit (ug/l)
N-Nitrosodimethylamine	N.D.	n.d.
Aniline	N.D.	n.d.
Bis(2-chloroethyl) ether	N.D.	8800
1,3-Dichlorobenzene	N.D.	8800
1,4-Dichlorobenzene	N.D.	8800
1,2-Dichlorobenzene	N.D.	8800
Bis(2-chloroisopropyl)ether	N.D.	8800
N-Nitroso-di-N-propylamine	N.D.	8800
Hexachloroethane	N.D.	8800
Nitrobenzene	N.D.	8800
Isophorone	N.D.	8800
Bis(2-chloroethoxy)methane	N.D.	8800
1,2,4-Trichlorobenzene	N.D.	8800
Naphthalene	40100	8800
Hexachlorobutadiene	N.D.	8800
Hexachlorocyclopentadiene	N.D.	8800
2-Chloronaphthalene	N.D.	8800
Dimethylphthalate	N.D.	8800
Acenaphthylene	N.D.	8800
2,6-Dinitrotoluene	N.D.	8800
Acenaphthene	N.D.	8800
Dibenzofuran	N.D.	8800
2,4-Dinitrotoluene	N.D.	8800
Diethyl phthalate	N.D.	8800
Fluorene	N.D.	8800
4-Chlorophenylphenyl ether	N.D.	8800
N-Nitrosodiphenyl amine	N.D.	8800
1,2-Diphenylhydrazine	N.D.	n.d.
4-Bromophenylphenyl ether	N.D.	8800
Hexachlorobenzene	N.D.	8800
Phenanthrene	10600	8800
Anthracene	N.D.	8800
Di-n-butyl phthalate	N.D.	8800
Fluoranthene	N.D.	8800
Benzidine	N.D.	n.d.
Pyrene	N.D.	8800
Butylbenzyl phthalate	N.D.	8800

Report Date:	01-Mar-88	Client Contract/PO:	9832,020.01
Client:	Harding Lawson Associates	Date Sampled:	11-Feb-88
Attn:	David Leland	Site:	Oakland, Chinatown
Sampled by:	W. Godwin	Date Received:	18-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge Date:	24-Feb-88
Preservatives:	none	Analysis Completion Date:	24-Feb-88
Analyst:	Siegmund		
WESCO JOB #:	HLA 0820-L		
Analytical Method:	EPA 8270	Holding Time, Days:	13 days

LAB # 8-1875 MATRIX: SOIL

CLIENT'S ID 1101/1703 (composite)

BASE/NEUTRALS Cont'd	RESULT (ug/l)	Detection Limit (ug/l)
Benzo(a)anthracene	N.D.	8800
3,3'-Dichlorobenzidine	N.D.	17333
Chrysene	N.D.	8800
Bis(2-ethylhexyl) phthalate	N.D.	8800
Di-n-octyl phthalate	N.D.	8800
Benzo(b)fluoranthene	N.D.	8800
Benzo(k)fluoranthene	N.D.	8800
Benzo(a)pyrene	N.D.	8800
Indeno(1,2,3-cd)pyrene	N.D.	8800
Dibenzo(a,h)anthracene	N.D.	8800
Benzo(g,h,i)perylene	N.D.	8800

QUALITY CONTROL DATA

Base/Neutral Surrogate Spike Recovery	percent
Nitrobenzene-d5	N.R.
2-Fluorobiphenyl	39 %
Terphenyl-d14	28 %

Report Date:	01-Mar-88	Client Contract/PO:	9832,020.01
Client:	Harding Lawson Associates	Date Sampled:	11-Feb-88
Attn:	David Leland	Site:	Oakland, Chinatown
Sampled by:	W. Godwin	Date Received:	18-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge Date:	24-Feb-88
Preservatives:	none	Analysis Completion Date:	24-Feb-88
Analyst:	Siegmund		
WESCO JOB #:	HLA 0820-L		
Analytical Method:	EPA 8270	Holding Time, Days:	13 days

LAB # 8-1875 MATRIX: SOIL
CLIENT'S ID 1101/1703 (composite)

ACID COMPOUNDS	RESULT (ug/l)	Detection Limit (ug/l)
Phenol	N.D.	8800
2-Chlorophenol	N.D.	8800
2-Methylphenol	N.D.	8800
4-Methylphenol	N.D.	8800
2-Nitrophenol	N.D.	8800
2,4-Dimethylphenol	N.D.	8800
Benzoic Acid	N.D.	44000
2,4-Dichlorophenol	N.D.	8800
4-Chloro-3-methylphenol	N.D.	17333
2,4,6-Trichlorophenol	N.D.	8800
2,4,5-Trichlorophenol	N.D.	8800
2,4-Dinitrophenol	N.D.	44000
4-Nitrophenol	N.D.	44000
2-Methyl-4,6-dinitrophenol	N.D.	44000
Pentachlorophenol	N.D.	44000

QUALITY CONTROL DATA Acid Surrogate Spike Recovery	percent
2-Fluorophenol	33 %
Phenol-d5	34 %
2,4,6-Tribromophenol	N.R.

Report Date:	01-Mar-88	Client Contract/PO:	9832,020.01
Client:	Harding Lawson Associates	Date Sampled:	11-Feb-88
Attn:	David Leland	Site:	Oakland, Chinatown
Sampled by:	W. Godwin	Date Received:	18-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge	
Preservatives:	none	Date:	24-Feb-88
Analyst:	Siegmund	Analysis Completion	
WESCO JOB #:	HLA 0820-L	Date:	24-Feb-88
Analytical Method:	EPA 8270	Holding Time, Days:	13 days

LAB # 8-1875 MATRIX: SOIL
CLIENT'S ID 1101/1703 (composite)

PESTICIDE COMPOUNDS	RESULT (ug/l)	Detection Limit (ug/l)
alpha-BHC	N.D.	n.d.
beta-BHC	N.D.	n.d.
gamma-BHC	N.D.	n.d.
delta-BHC	N.D.	n.d.
Heptachlor	N.D.	n.d.
Aldrin	N.D.	n.d.
Heptachlor epoxide	N.D.	n.d.
Endosulfan I	N.D.	n.d.
4,4'-DDE	N.D.	n.d.
Dieldrin	N.D.	n.d.
Endrin	N.D.	n.d.
Endosulfan II	N.D.	n.d.
4,4'-DDD	N.D.	n.d.
Endrin Aldehyde	N.D.	n.d.
4,4'-DDT	N.D.	n.d.
Endosulfan Sulfate	N.D.	n.d.

QUALITY CONTROL DATA

Pesticide Surrogate Spike Recovery	percent
Nitrobenzene-d5	N.R.
2-Fluorobiphenyl	39 %
Terphenyl-d14	28 %

OTHER EXTRACTABLES	RESULT (ug/l)	Detection Limit (ug/l)
Acetophenone	N.D.	n.d.
4-Aminobiphenyl	N.D.	n.d.
Arochlors	N.D.	n.d.
Benzyl Alcohol	N.D.	n.d.
Chlordane	N.D.	n.d.
4-Chloroaniline	N.D.	n.d.
1-Chloronaphthalene	N.D.	n.d.
Dibenz(a,j)acridine	N.D.	n.d.
2,6-Dichlorophenol	N.D.	n.d.
p-Dimethylaminoazobenzene	N.D.	n.d.

Report Date:	01-Mar-88	Client Contract/PO:	9832,020.01
Client:	Harding Lawson Associates	Date Sampled:	11-Feb-88
Attn:	David Leland	Site:	Oakland, Chinatown
Sampled by:	W. Godwin	Date Received:	18-Feb-88
Submitted by:	W. Godwin	Extract/Digest/Purge Date:	24-Feb-88
Preservatives:	none	Analysis Completion Date:	24-Feb-88
Analyst:	Siegmund		
WESCO JOB #:	HLA 0820-L		
Analytical Method:	EPA 8270	Holding Time, Days:	13 days

LAB # 8-1875 MATRIX: SOIL
CLIENT'S ID 1101/1703 (composite)

OTHER EXTRACTABLES (cont)	RESULT (ug/l)	Detection Limit (ug/l)
7,12-Dimethylbenz(a)-anthracene	N.D.	n.d.
alpha,alpha-Dimethylphen-ethylamine	N.D.	n.d.
Endrin Ketone	N.D.	n.d.
Ethylmethane sulfonate	N.D.	n.d.
Methoxychlor	N.D.	n.d.
3-Methylchloranthene	N.D.	n.d.
Methylmethane sulfonate	N.D.	n.d.
2-Methylnaphthalene	139000	n.d.
1-Naphthylamine	N.D.	n.d.
2-Naphthylamine	N.D.	n.d.
2-Nitroaniline	N.D.	n.d.
3-Nitroaniline	N.D.	n.d.
4-Nitroaniline	N.D.	n.d.
N-Nitrosophenylamine	N.D.	n.d.
N-Nitrosopiperidine	N.D.	n.d.
Pentachlorobenzene	N.D.	n.d.
Pentachloronitrobenzene	N.D.	n.d.
2-Picoline	N.D.	n.d.
Pronamide	N.D.	n.d.
1,2,4,5-Tetrachlorobenzene	N.D.	n.d.
2,3,4,6-Tetrachlorobenzene	N.D.	n.d.
Toxaphene	N.D.	n.d.
Biphenyl	N.D.	n.d.
Diphenylamine	N.D.	n.d.
beta-Naphthylamine	N.D.	n.d.
Dibenzothiophene	N.D.	n.d.

N.D.: Not Detected
n.d.: not determined
N.A.: Not Applicable
N.R.: Not Recovered

Doug Cram for Attalla
Analytical Supervisor

BLANK, SPIKE DUPLICATE AND SPIKE REPORT JOB # HLA 0820-L
METHOD EPA 8270

COMPOUND	Blank (ug/l)	Spike Dupl. % Deviation 8-1875 HLA 0820-L	% Spike Recovery 8-1875 HLA 0820-L
Sample #			
BASE NEUTRAL COMPOUNDS			
N-Nitrosodimethylamine	N.D.	n.s.	n.s.
Aniline	N.D.	n.s.	n.s.
Bis(2-chloroethyl) ether	N.D.	n.s.	n.s.
1,3-Dichlorobenzene	N.D.	n.s.	n.s.
1,4-Dichlorobenzene (MS)	N.D.	9	49
1,2-Dichlorobenzene	N.D.	n.s.	n.s.
Bis(2-chloroisopropyl)ether	N.D.	n.s.	n.s.
N-Nitroso-di-N-propylamine	N.D.	n.s.	n.s.
Hexachloroethane	N.D.	n.s.	n.s.
Nitrobenzene-d5 (SS)	N.A.	42	41
Nitrobenzene	N.D.	n.s.	n.s.
Isophorone	N.D.	n.s.	n.s.
Bis(2-chloroethoxy)methane	N.D.	n.s.	n.s.
1,2,4-Trichlorobenzene	N.D.	n.s.	n.s.
Naphthalene	N.D.	n.s.	n.s.
Hexachlorobutadiene	N.D.	n.s.	n.s.
Hexachlorocyclopentadiene	N.D.	n.s.	n.s.
2-Fluorobiphenyl (SS)	N.A.	29	40
2-Chloronaphthalene	N.D.	n.s.	n.s.
Dimethylphthalate	N.D.	n.s.	n.s.
Acenaphthylene	N.D.	n.s.	n.s.
2,6-Dinitrotoluene	N.D.	n.s.	n.s.
Acenaphthene (MS)	N.D.	16	46
Dibenzofuran	N.D.	n.s.	n.s.
2,4-Dinitrotoluene (MS)	N.D.	64	39
Diethyl phthalate	N.D.	n.s.	n.s.
Fluorene	N.D.	n.s.	n.s.
4-Chlorophenylphenyl ether	N.D.	n.s.	n.s.
N-Nitrosodiphenyl amine	N.D.	n.s.	n.s.
1,2-Diphenylhydrazine	N.D.	n.s.	n.s.
4-Bromophenylphenyl ether	N.D.	n.s.	n.s.
Hexachlorobenzene	N.D.	n.s.	n.s.
Phenanthrene	N.D.	n.s.	n.s.
Anthracene	N.D.	n.s.	n.s.
Di-n-butyl phthalate	N.D.	n.s.	n.s.
Fluoranthene	N.D.	n.s.	n.s.
Benzidine	N.D.	n.s.	n.s.
Pyrene (MS)	N.D.	27	29
Terphenyl-d12 (SS)	N.A.	22	25
Butylbenzyl phthalate	N.D.	n.s.	n.s.
Benzo(a)anthracene	N.D.	n.s.	n.s.
3,3'-Dichlorobenzidine	N.D.	n.s.	n.s.
Chrysene	N.D.	n.s.	n.s.
Bis(2-ethylhexyl) phthalate	N.D.	n.s.	n.s.
Di-n-octyl phthalate	N.D.	n.s.	n.s.

BLANK, SPIKE DUPLICATE AND SPIKE REPORT JOB # HLA 0820-L
METHOD EPA 8270

COMPOUND	Blank (ug/l)	Spike Dupl. % Deviation	% Spike Recovery
Sample #		8-1875 HLA 0820-L	8-1875 HLA 0820-L
BASE NEUTRAL COMPOUNDS (cont)			
Benzo(b)fluoranthene	N.D.	n.s.	n.s.
Benzo(k)fluoranthene	N.D.	n.s.	n.s.
Benzo(a)pyrene	N.D.	n.s.	n.s.
Indeno(1,2,3-cd)pyrene	N.D.	n.s.	n.s.
Dibenzo(a,h)anthracene	N.D.	n.s.	n.s.
Benzo(g,h,i)perylene	N.D.	n.s.	n.s.
QUALITY CONTROL DATA			
Base/Neutral Blank Surrogate Spike Recovery			percent
Nitrobenzene-d5			46 %
2-Fluorobiphenyl			45 %
Terphenyl-d14			31 %
ACID COMPOUNDS			
2-Fluorophenol (SS)	N.A.	0	31
Phenol-d5 (SS)	N.A.	8	37
Phenol (MS)	N.D.	20	44
2-Chlorophenol	N.D.	n.s.	n.s.
2-Methylphenol	N.D.	n.s.	n.s.
4-Methylphenol	N.D.	n.s.	n.s.
2-Nitrophenol	N.D.	n.s.	n.s.
2,4-Dimethylphenol	N.D.	n.s.	n.s.
Benzoic Acid	N.D.	n.s.	n.s.
2,4-Dichlorophenol	N.D.	n.s.	n.s.
4-Chloro-3-methylphenol (MS)	N.D.	34	45
2,4,6-Trichlorophenol	N.D.	n.s.	n.s.
2,4,5-Trichlorophenol	N.D.	n.s.	n.s.
2,4-Dinitrophenol	N.D.	n.s.	n.s.
4-Nitrophenol (MS)	N.D.	N.R.	N.R.
2-Methyl-4,6-dinitrophenol	N.D.	n.s.	n.s.
2,4,6-Tribromophenol (SS)	N.A.	4	28
Pentachlorophenol (MS)	N.D.	12	18
QUALITY CONTROL DATA			
Acid Surrogate Blank Spike Recovery			percent
2-Fluorophenol			51 %
Phenol-d5			45 %
2,4,6-Tribromophenol			73 %

BLANK, SPIKE DUPLICATE AND SPIKE REPORT JOB # HLA 0820-L
METHOD EPA 8270

COMPOUND	Blank (ug/l)	Spike Dupl. % Deviation	% Spike Recovery
Sample #		8-1875 HLA 0820-L	8-1875 HLA 0820-L
PESTICIDES			
alpha-BHC	N.D.	n.s.	n.s.
beta-BHC	N.D.	n.s.	n.s.
gamma-BHC	N.D.	n.s.	n.s.
delta-BHC	N.D.	n.s.	n.s.
Heptachlor	N.D.	n.s.	n.s.
Aldrin	N.D.	n.s.	n.s.
Heptachlor epoxide	N.D.	n.s.	n.s.
Endosulfan I	N.D.	n.s.	n.s.
4,4'-DDE	N.D.	n.s.	n.s.
4-Terphenyl-d14 (SS)	N.A.	22	25
Dieldrin	N.D.	n.s.	n.s.
Endrin	N.D.	n.s.	n.s.
Endosulfan II	N.D.	n.s.	n.s.
4,4'-DDD	N.D.	n.s.	n.s.
Endrin Aldehyde	N.D.	n.s.	n.s.
4,4'-DDT	N.D.	n.s.	n.s.
Endosulfan Sulfate	N.D.	n.s.	n.s.

N.D.: Not Detected
n.s.: Not Spiked
N.R.: Not Recovered
(SS): Surrogate Spike
(MS): Matrix Spike
N.A.: Not Applicable

Doug Drum for Hatalla
Analytical Supervisor

Report Date: 02-Mar-88
Client: Harding Lawson Associates
Attn: Dave Leland
Sampled by: W. Godwin
Submitted by: W. Godwin
Preservatives: none
Analyst: Libby/Staggs/Ana.
WESCO JOB #: HLA 0816-L
Analytical Method: Metals

Client Contract/PO 9382,019.02
Date Sampled: 11-Feb-88
Site: Oakland Chinatown
Date Received: 11-Feb-88
Extract/Digest/Purge Date: 11-Feb-88
Analysis Completion Date: 11-Feb-88
Hold Time 0 days

MATRIX: SOIL

LAB #	CLIENT ID	Antimony (Sb) (mg/kg)	Arsenic (As) (mg/kg)	Barium (Ba) (mg/kg)	Beryllium (Be) (mg/kg)	Cadmium (Ca) (mg/kg)	Chromium (Cr) (mg/kg)
		vault surface					
8-1660	88061101	0.12	4.85	130	N.D.	17	39.0
8-1661	88061102	0.21	5.33	360	N.D.	29	50.5
		excavation 4-5'					
Detection limit		0.10	0.67	2	1	2	2.0
Method number		EPA 7041	EPA 7061	EPA 6010	EPA 6010	EPA 7130	EPA 7190

LAB #	CLIENT ID	Cobalt (Co) (mg/kg)	Copper (Cu) (mg/kg)	Lead (Pb) (mg/kg)	Mercury (Hg) (mg/kg)	Molybdenum (Mo) (mg/kg)	Nickel (Ni) (mg/kg)
8-1660	88061101	8.9	340	530	0.8	0.21	71
8-1661	88061102	9.9	382	509	1.2	0.35	2
Detection limit		2.0	2	2	0.0007	0.4	2
Method number		EPA 7200	EPA 7210	EPA 7420	EPA 7470	EPA 7481	EPA 7520

LAB #	CLIENT ID	Selenium (Se) (mg/kg)	Silver (Ag) (mg/kg)	Thallium (Tl) (mg/kg)	Vanadium (V) (mg/kg)	Zinc (Zn) (mg/kg)
8-1660	88061101	N.D.	N.D.	0.14	41.0	1374
8-1661	88061102	N.D.	N.D.	0.12	41.6	1577
Detection limit		0.03	2	0.05	0.4	2
Method number		EPA 7741	EPA 7760	EPA 7841	EPA 7911	EPA 7950

N.D.: Not Detected

Susan Libby
Analytical Supervisor

BLANK, SPIKE DUPLICATE AND SPIKE REPORT JOB # HLA 0816-L
METHOD: Metals

COMPOUND	Blank (mg/l)	Spike Duplicate % deviation	Spike % recovery
Sample #		8-1660	8-1660
Antimony	N.D.	11	10*
Arsenic	N.D.	13	79
Barium	N.D.	-	-
Beryllium	N.D.	-	-
Cadmium	N.D.	4	96
Chromium	N.D.	6	97
Cobalt	N.D.	4	96
Copper	N.D.	6	103
Lead	N.D.	1	81
Mercury	N.D.	24	73
Molybdenum	N.D.	-	M.I.
Nickel	N.D.	15	114
Selenium	N.D.	4	54
Silver	N.D.	3	102
Thallium	N.D.	14	53**
Vanadium	N.D.	9	110
Zinc	N.D.	1	103

N.D.: Not Detected
M.I.: Matrix interference
* : Matrix interference. DI water spike yielded 96% recovery.
** : Matrix interference. DI water spike yielded 93% recovery.

Susan Libby
Analytical Supervisor

DISTRIBUTION

REPORT OF SYSTEM MONITORING: MARCH 12 - 15, 1988
DEWATERING EFFLUENT TREATMENT SYSTEM
CHINATOWN REDEVELOPMENT PROJECT AREA
OAKLAND, CALIFORNIA
March 18, 1988

COPY NO. 5

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DFL/PAM/dm/C3528-R

Quality Control Reviewer

Christopher R. Smith
Associate Hydrogeologist