aqua resources inc.

2030 Addison Street, Suite 500 • Berkeley, California 94704 • 415 540-6954

June 1, 1989

87157.6

Alameda County Health Agency
Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621

Attn: Lowell Miller

Subject: Monitoring Well Installation and Groundwater Monitoring Program
Mill Springs Park Apartments
(Formerly Livermore Superblock)
Railroad Avenue between South P and South L Streets
Livermore, California

INTRODUCTION

As part of the groundwater investigation and monitoring program at the Mill Springs Park Apartment Site, Aqua Resources Incorporated (ARI) installed a groundwater monitoring well at the subject site. Installation of the monitoring well was required by the Alameda County Health Agency, Environmental Health Department - Hazardous Materials Division as part of the Approved Final Closure Plan dated October 23, 1988. The purpose of the monitoring well is to determine whether leakage of fuel oil from the previously removed concrete vault structure had contaminated groundwater underlying the site. Location of the monitoring well was determined based on the results of a March 14, 1989 Groundwater Study Report, and approved by the Alameda County Health Agency.

This letter report includes the following information:

- Description of the monitoring well installation procedures, sampling methodology and chemical analyses performed,
- discussion of results of chemical analyses, and
- conclusions based on field observations and interpretation of chemical analytical data.

Copies of the drafted well log, Alameda County Flood Control and Water Conservation District Well Permit Form, Chain of Custody Forms and the Certified Chemical Analysis reports are presented as attachments to this report.

As part of the required monitoring program, quarterly groundwater sampling of monitoring well will be performed by ARI for one year. Results of quarterly sampling will be presented as addenda to this report. The addenda will consist of a brief cover letter giving the date of sampling and copies of the Chain of Custody form and certified laboratory reports. A final report summarizing the quarterly data will be prepared including interpretation of the data, conclusions and recommendations.

Monitoring Well Installation Procedure

Prior to installation of the monitoring well, a site reconnaissance was performed to field locate the approved monitoring well location. At the time the site reconnaissance was performed, the tank excavation had been backfilled and site development was in progress.

On April 20, 1989, one groundwater monitoring well was installed at the site by HEW Drilling Company of Palo Alto, using a CME-75 drill rig equipped with an eight-inch diameter hollow stem auger. The monitoring well location is shown on the attached Monitoring Well Location Plan. Augers were steam cleaned prior to drilling. A standard split barrel sampler, with a 2-5/8 inch outer diameter and 2 inch inner diameter, was used for soil sampling. The sampler has the capacity for obtaining an 18-inch sample using three six-inch long brass liners. Prior to obtaining each sample, the disassembled sampler and the brass liners were washed in a solution of TSP in water. Each piece was triple rinsed, with the final rinse being distilled water.

A boring log was prepared for the well in the field. Blow counts were recorded for each six inches of penetration of the sampler, and the time at which each sample was taken was noted on the log. Soil samples were collected at five-foot intervals during the drilling of the well. The soil exposed in the ends of the tube was quickly noted, and the ends were then sealed with teflon tape and new snug-fitting plastic caps. The edges of the caps were sealed with plastic tape. The cap was labeled with the sample number, depth, date, and project name. A second sample was taken from each five-foot interval to be reserved for inspection if needed at a later date. The third sample, if recovered, was used for the sample description.

The soil samples were placed in a chilled ice chest as they were collected. Selected soil samples were submitted for chemical analyses, remaining samples were held pending results of the chemical analyses.

The monitoring well was installed at the conclusion of soil sampling. The monitoring well casing consisted of two-inch diameter Schedule 40 PVC pipe. The bottom of the well casing was closed with a screw-on cap. The well casing was slotted (slot opening 0.020 inches) between depths of 30 feet and 60 feet. The annulus space between the casing and bore wall was filled with #3 RMC Lonestar sand to a depth of 28 feet below existing grade (about two feet above the top of slotted casing). A three foot seal of 3/8-inch diameter bentonite pellets was constructed immediately above the sand pack, and the remainder of the annulus was filled with cement grout. The top of the well casing was fitted with a locking cap. Because the monitoring well is located in a landscape area, the well head was constructed within a christy box. The christy box was completed in a manner to reduce the potential for surface water runoff from ponding around the well head.

On May 1, 1989, the groundwater depth was measured to the top of the casing in the well, to the nearest hundredth of a foot, using an electronic interface probe. The well was developed by evacuating approximately 20 gallons of water from the well, using a three-foot teflon bailer. The water removed from the well was placed in sealed containers and stored onsite pending results of chemical analyses and determination of appropriate disposal.

After the well was developed and allowed to recover, a groundwater sample was collected using the bailer. Prior to developing the well, and again before collection of the groundwater sample, the bailer was cleaned in a solution of TSP in water, rinsed with tap water, and given a final rinse with distilled water. A new length of nylon rope was used for lowering and raising the bailer. The first sample from the well was retrieved from the surface of the water, and the contents of the bailer were observed to assess whether there was substantial floating product present. The sample vials and jars, provided by the laboratory, were filled from the bailer. The sample vials were placed in a chilled ice chest and transported to the laboratory under chain-of-custody control.

Site Condition Summary

The site is currently being developed for residential apartments. The immediate area that surrounds the monitoring well will consist of landscape improvements. Building Two is immediately east of the monitoring well. Except where directed to existing catch basins, surface drainage is generally to the west and southwest in the vicinity of the monitoring well.

During the boring for the monitoring well, sandy clay gravel fill was encountered from the ground surface to a depth of about five feet. The fill is underlain to the depth explored (about 62 feet) with native soils consisting of interbedded clayey sand, gravelly sand, silty sand, sandy gravel, and silty clay. A slight hydrocarbon odor was noted in the soil samples obtained between

Detected up to 220 ppm TPH-D at ~27'
No TPH-D at 50+55'. No analysis for BTEX

depths of about 50 and 55 feet. Detailed subsurface conditions encountered in the boring are presented on the attached boring log.

Free groundwater was first observed during drilling at a depth of about 43 1/2 feet. Prior to bailing (12 days after well completion) the free groundwater level was observed at a depth of 42.74 feet. The water level at the time of groundwater sample collection was 43.87 feet. Floating product was not observed in the bailer when the first water sample was retrieved.

Summary of Chemical Analyses and Discussion of Results

As discussed earlier, soil and groundwater samples selected for chemical analysis were submitted to a State certified laboratory utilizing chain of custody protocols. Chemical analyses were performed by Curtis and Tompkins, Ltd, Analytical Laboratories in Berkeley. Chemical analyses, on soils included determination of Total Petroleum Hydrocarbons (TPH); Chemical Analyses of the groundwater included TPH, , Benzene, Toluene, Xylene, Ethyl-benzene (BTX & E). Results of the chemical analyses are presented on the attached certified laboratory reports.

Conclusions and limitations

Based on the analyses of the soil and groundwater samples collected from the monitoring well, there does not appear to be significant hydrocarbon contamination associated with the concrete vault structure that was removed. Review of the chemical test results indicates that all the TPH analytes were below the method detection limits for the soil sample except for the diesel component in three samples. The reason for this is unclear since diesel was not detected in any previous soil samples analyzed at the site during final site remediation. Similarly, all analytes were also below the method detection limits for the water sample.

Our groundwater investigation, was limited to the installation and development of one groundwater monitoring well, soil and groundwater sample collection. Chemical analyses were performed by others, not under ARI direct supervision. Test results are reported as received. Final determination of additional site remediation, if required, will be determined by the Alameda County Public Health Agency. We cannot guarantee or warrant that soil or groundwater at this site are not contaminated above allowable limits for a given contaminant. This report is limited in its scope to the analyses and review of samples obtained from the one monitoring well as required by the regulatory agency. All services were performed in substantial conformance with current standards of environmental engineering practice. No other warranty express or implied is made.

It has been a pleasure to provide you with this information. If you have any questions regarding the above, please do not hesitate to contact the undersigned.

Very truly yours,
AQUA RESOURCES INC.

Mark Milani, P.E.
Project Manager

cc: Addressee (2)

Barnett-Range Corporation (2)

Mill Springs Park Apartment Field Office
Attn: Mr. Larry Malcolm

Attachments: Approved Well Permit
Log of Boring/Monitoring Well
Certified Laboratory Reports
Chain of Custody Form
Monitoring Well Location Plan

ORIGINAL

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94566 • (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

(1) LOCATION OF PROJECT 1799 Railroad Avenue
Livermore, Calif. 94550

(2) CLIENT
Name Barnett Range Corporation
Address P.O. Box 8189 Phone 209-951-5140
City Stockton, CA Zip 95208-1489

(3) APPLICANT
Name Aqua Resources
2030 Addison Street
Address Suite 500 Phone 540-6954
City Berkeley, CA Zip 94704

(4) DESCRIPTION OF PROJECT
Water Well Construction ___ Geotechnical Investigation
Cathodic Protection ___ General ___
Well Destruction ___ Contamination ✓

(5) PROPOSED WATER WELL USE
Domestic ___ Industrial ___ Irrigation ___
Municipal ___ Monitoring ✓ Other ___

(6) PROPOSED CONSTRUCTION
Drilling Method:
Mud Rotary ___ Air Rotary ___ Auger ✓
Cable ___ Other ___
DRILLER'S LICENSE NO. 384167 HEW Drilling, East Palo Alto

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 20 ft.
Surface Seal Depth 20 ft. minimum * Number 1

GEOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ in. Depth ___ ft.

(7) ESTIMATED STARTING DATE 3/30/89
ESTIMATED COMPLETION DATE 3/30/89

(8) I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] Date 3-17-89

FOR OFFICE USE

PERMIT NUMBER 89156
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic, irrigation, and monitoring wells unless a lesser depth is specially approved.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 20 Mar 89
Wyman Hong

21989

AQUA RESOURCES, INC.

OBSERVATION WELL INSTALLATION REPORT

Well # [redacted]-1

Project: Mill Springs Park Apartments (87157.6)

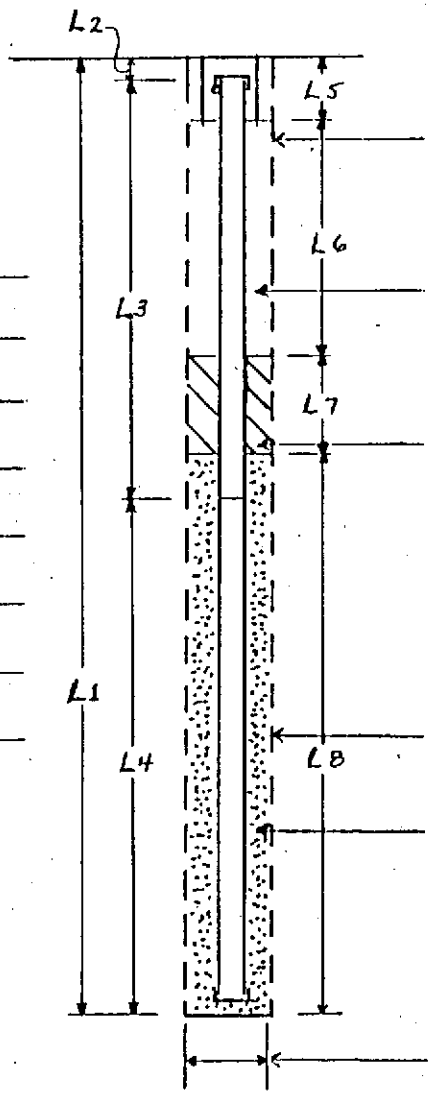
Location: Livermore, CA

Type of Rig: CME-75 Installed by: HEW Drilling Company

Date Started: April 20, 1989 Date Finished: April 20, 1989

Type of Observation Well: Monitoring Well Ground Elev.: 477.28 Casing Top, Elev.: 477.08

L1 60 feet
L2 0.20 feet
L3 29.8 feet
L4 30-60' 30 feet
L5 0.5 feet
L6 24.5 feet
L7 3 feet
L8 32 feet



Cap: 2" diameter locking cap

Type of Casing: 2" diameter, Schedule 40 PVC

Type of Backfill: Cement-Bentonite grout, 3 sack mix

Type of Seal Material: 3/8" diameter Volclay Bentonite Pellets

Size of Openings: 0.020 inches

Type of Filter Material: No. 3 RMC Lonestar Sand

Diameter of Boring: 8 3/4" diameter

Remarks: Well developed on May 1, 1989

Inspected By: M. Milani

BORING LOCATION: MW-1
DRILLING CONTRACTOR: HEW Drilling Co. | DRILLER:
DRILLING EQUIPMENT: CME-75
DIAMETER OF BORING: 8 3/4 inches
PURPOSE OF BORING: Monitoring Well Installation
SAMPLING EQUIPMENT: 2 ½-inch O.D. Split Barrel
COMMENTS: 140-lb. hammer, 30-inch fall

ELEVATION AND DATUM: 477.28 feet, Mean Sea Level
DATE STARTED: Apr 20, 1989
COMPLETION DEPTH (FT): 61½
NO. OF DIST. SAMPLES: -
WATER DEPTH (FT) FIRST: 43½
LOGGED BY: M. Milani

DATE FINISHED: Apr 20, 1989
ROCK DEPTH (FT): -
UNDIST.: 26 | CORE: -
COMPL.: - | 24 HRS.: -
CHECKED BY: P. Rodgers

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG LITHOLOGY	SAMPLES NO.	SAMPLES TYPE	SAMPLES BLOW COUNT	DRILLING RATE/ TIME	REMARKS
	Fill: CLAYEY, SANDY GRAVEL, gray-brown, moist, medium dense, fine to coarse grained sand, fine to medium size gravel (GC)						BL=Brass Liner Blow counts per 6-inch drive interval given in ()
5	CLAYEY SAND, red-brown, moist, medium dense, fine to coarse grained, trace gravel (SC)		1	BL	27		(7/12/15) 8:50 2 liners recovered no odor
10	GRAVELLY SAND, gray-brown, moist, medium dense, fine to coarse grained sand, medium size gravel, large gravel in shoe, trace clay (SW)		2	BL	35		(12/17/18) 9:00 2 liners recovered no odor
	SANDY GRAVEL, gray-brown, moist to wet, medium dense, trace clay (GW)						
15	SILTY CLAY, mottled red-brown and yellow-brown moist to wet, soft, trace fine grained sand, moderate plasticity (CL)		3	BL	9		(1/3/6) 9:10 lost lower two samples, resampled, recovered 2 additional liners no odor
	GRAVELLY SAND, red-brown, moist to wet, very dense, fine to coarse grained sand, fine to medium size gravel, iron oxide staining (SW)						
20			4	BL	65		(10/30/35) 9:22 3 liners recovered no odor
	Trace clay below 23 feet						
25	GRAVELLY SAND, blue-gray, moist-wet, dense, fine to coarse grained sand, fine to medium size gravel. (SW)		5	BL	49		(11/22/27) 9:33 2 liners recovered
30							220 ppm VOCs ND TPHG or BTEX

Project: Mill Springs Park Apartments
Project No.: 87157.6

LOG OF BORING

Fig.

AQUA RESOURCES, INC.
BERKELEY, CALIFORNIA

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG LITHOLOGY	SAMPLES NO.	SAMPLES TYPE	SAMPLES BLOW COUNT	SAMPLES DRILLING RATE/TIME	REMARKS
30	GRAVELLEY SAND, continued SILTY SAND, green-gray, wet, medium dense, fine grained (SM)	6	6	BL	47		(16/31/16) 9:45 2 liners recovered no odor
35	GRAVELLY SAND, green-gray, moist to wet, medium dense, fine grained sand, fine to medium size gravel, with stringers of silty clay (SP)	7	7	BL	31		(14/19/12) 10:05 3 liners recovered no odor
40		8	8	BL	95	10"	(30/45/50 [4"]) 10:25 2 liners recovered no odor 140ppm ND TPH-G/K
45	SANDY GRAVEL, brown, wet to saturated, dense, fine to coarse grained sand, medium to coarse size gravel (GW) Saturated below 43½ feet	9	9	BL	47		Free water encountered during drilling at 43½ feet (14/23/24) 10:45 no odor, 1 liner recovered
50	blue-gray and very dense below 50 feet	10	10	BL	83		(11/33/50) 11:05 strong odor, 2 liners recovered 1180ppm ND TPH-G/K
55	Mottled gray-brown and blue-gray, fine to coarse grained sand, fine to coarse grained gravel, thin sand interbed between 55 and 55½ feet	11	11	BL	52		(10/22/30) 11:25 slight odor, 2 liners recovered
60	CLAYEY SAND, brown, saturated, very dense, fine to medium grained sand, trace medium size gravel (SC)	12	12	BL	83		(14/43/40) 11:50 no odor, 2 liners recovered ND TPH-G/D/K
	Boring terminated at 61½ feet 2-inch diameter PVC monitoring well installed						
65							
70							

Project

Project No.

CONT. LOG OF BORING

Fig.

AQUA RESOURCES, INC.
BERKELEY, CALIFORNIA

17245

AQUA RESOURCES, INC.

SHIPMENT NO.: 1

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

DATE 4/21/89

PROJECT NAME: Mill Springs Landfill Art

PROJECT NO.: 3715.6

	Sample Number	Location	Type of Sample: Material	Type of Sample: Method	Type of Container	Type of Preservation: Temp	Type of Preservation: Chemical	Analysis Required	
1	MW1-1-1	6-6½	Soil	Drive	Brass Liner	ICE		TPH	1
2	MW1-2-1	11-11½				Chill		Hold	2
3	MW1-3-1	16-16½						TPH	3
4	MW1-4-1	21-21½						Hold	4
5	MW1-5-1	26-26½						TPH	5
6	MW1-6-1	31-31½						Hold	6
7	MW1-7-1	36-36½						Hold	7
8	MW1-8-1	41-41½						TPH	8
9	MW1-9-1	46-46½						Hold	9
10	MW1-10-1	51-51½						TPH	10
11	MW1-11-1	56-56½						Hold	11
12	MW1-12-1	61-61½						TPH	12

Total Number of Samples Shipped: 12 | Sampler's Signature: M. Malone

Relinquished By:
Signature: Mark Malone
Printed Name: Mark Malone
Company: Aqua Resources
Reason: To Lab Courier

Received By:
Signature: [illegible]
Printed Name: SCOTT R. ITEMANN
Company: CET

Date: 4/21/89
Time: 9:40

Relinquished By:
Signature:
Printed Name:
Company:
Reason:

Received By:
Signature:
Printed Name:
Company:

Date: / /
Time:

REMARKS:
- Do not run analysis until verbal authorization / confirmation given by Mark Malone or Denis Burbank.
- Analysis are to be performed on standard 2-week laboratory basis.
- Samples indicated "hold": additional analysis may be performed on these samples pending results of above analysis

Special Shipment / Handling / Storage Requirements:

AQUA RESOURCES, INC.
2030 ADDISON STREET, SUITE 500
Berkeley, CA. 94704
(415)540-6954

17307

CHAIN OF CUSTODY RECORD

Project Code	Project Name
87157.6	~~Barnett~~ Range Mill Springs Park

SAMPLERS (Signature)
J. Shakofsky

	TPH	BTX&E	REMARKS
MW-1	✓	✓	

Relinquished by: (Signature)	Date/Time	Received by (Signature)	Relinquished by (Signature)	Date/Time	Received by (Signature)
S. Shakofsky				05/02/89 8:11	J. Anderson
Relinquished by (Signature)	Date/Time	Received by (Signature)	Relinquished by (Signature)	Date/Time	Received by (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	
		J. Anderson			

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 17245A
CLIENT: Aqua Resources, Inc.
JOB #: 87157.6
LOCATION: MILL SPRINGS PARK APT.

DATE RECEIVED: 04/21/89
DATE ANALYZED: 04/25/89
DATE REPORTED: 05/31/89

Extractable Petroleum Hydrocarbons in Soils & Wastes
EPA 8015 (Modified)
Extraction Method: EPA 3550

LAB ID	CLIENT ID	GASOLINE (mg/Kg)	KEROSINE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
17245-1	MW1-1-1	ND(10)	ND(10)	ND(10)	ND(10)
17245-3	MW1-3-1	ND(10)	ND(10)	ND(10)	ND(10)
17245-5	MW1-5-1	ND(10)	ND(10)	220 *	ND(10)
17245-8	MW1-8-1	ND(10)	ND(10)	140 *	ND(10)
17245-10	MW1-10-1	ND(10)	ND(10)	11 *	ND(10)
17245-12	MW1-12-1	ND(10)	ND(10)	ND(10)	ND(10)

* Fingerprint pattern does not match Hydrocarbon Standards. Quantitation based on largest peaks within diesel range (C11-C22).

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

Duplicate: Relative % Difference	6
Spike: % Recovery	110

AQUA RESOURCES, INC.
RECEIVED
JUN - 5 1989
JOB NO. _____
FILE _____

LABORATORY DIRECTOR

Curtis & Tompkins, Ltd., Analytical Laboratories. Since 1878
2323 Fifth Street, Berkeley, CA 94710. Phone (415) 486-0900

DATE RECEIVED: 05/02/89
DATE REPORTED: 05/10/89

LAB NUMBER: 17307

CLIENT: AQUA RESOURCES, INC.

REPORT ON: 1 WATER SAMPLE

JOB #: 87157.6
LOCATION: MILL SPRINGS PARK

RESULTS: SEE ATTACHED

Laboratory Director

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 17307
CLIENT: AQUA RESOURCES, INC.
PROJECT #: 87157.6
LOCATION: MILL SPRINGS PARK

DATE RECEIVED: 05/02/89
DATE ANALYZED: 05/08/89
DATE REPORTED: 05/10/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
17307-1A	MW-1	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	5
Spike: % Recovery	89

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 17307
CLIENT: AQUA RESOURCES, INC.
JOB NUMBER: 87157.6
JOB LOCATION: MILL SPRINGS PARK

DATE RECEIVED: 05/02/8
DATE ANALYZED: 05/03/8
DATE REPORTED: 05/10/8

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/kg)	TOLUENE (ug/kg)	TOTAL XYLENES (ug/kg)	ETHYL BENZENE (ug/kg)
17307-1B	MW-1	ND(1)	ND(1)	ND(1)	ND(1)

QA/QC SUMMARY

%RPD	5
%RECOVERY	96