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STUD 1145

DH

February 24, 1999

GROUNDWATER MONITORING WELL SAMPLING
AND CONFIRMATION SOIL COLLECTION REPORT
ASE JOB NO. 3457

at
Mash Petroleum Site
5725 Thornhill Drive
Oakland, California

Prepared by:
AQUA SCIENCE ENGINEERS, INC.
208 West El Pintado
Danville, CA 94526
(925) 820-9391

1.0 INTRODUCTION

Site Location (Site), See Figure 1

5725 Thornhill Drive
Oakland, California

Client

Mr. Mo Mashhoon
Mash Petroleum, Inc.
5725 Thornhill Drive
Oakland, CA 94611

Environmental Consulting Firm

Aqua Science Engineers, Inc. (ASE)
208 West El Pintado
Danville, CA 94526
Contact: Robert Kitay, Senior Geologist
(925) 820-9391

Agency Review

Mr. Hernan Gomez
City of Oakland Fire Department
Office of Emergency Services Division
505 14th Street, 7th Floor
Oakland, CA 94612
(510) 238-3938

Alameda County Health Care Services Agency (ACHCSA)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502
Contact: Mr. Tom Peacock
(510) 567-6700

California Regional Water Quality Control Board (RWQCB),
San Francisco Bay Region
1515 Clay Street Street, Suite 1400
Oakland, CA 94612
Contact: Mr. Chuck Headlee
(510) 622-2433

The following is a report detailing the results of the February 1999 groundwater sampling and confirmation soil sampling at the above referenced site.

2.0 SCOPE OF WORK

ASE's scope of work for this project was to:

- 1) Survey the top of casing elevation of the three site monitoring wells.
- 2) Collect groundwater samples from monitoring well MW-3 which was not sampled during the October 13, 1998 groundwater sampling performed by Penn Environmental.
- 3) Collect sidewall soil samples from the waste oil tank excavation and analyze the samples for total petroleum hydrocarbons as gasoline (TPH-G) by EPA Method 5030/8015M, total petroleum hydrocarbons as diesel (TPH-D) and motor oil (TPH-MO) by EPA Method 3510/8015M, benzene, toluene, ethylbenzene and total xylenes (collectively known as BTEX) by EPA Method 8020 and methyl tertiary butyl ether (MTBE) by EPA Method 8020.
- 4) Prepare a report presenting the methods and findings of this assessment.

3.0 MONITORING WELL ELEVATION SURVEY AND GROUNDWATER FLOW DIRECTION

On February 4, 1999, ASE surveyed the top of casing elevations of monitoring wells MW-1, MW-2 and MW-3 relative to a project datum (Figure 2). Monitoring well MW-3 was estimated to be 600-feet above mean sea level (msl) based on contour elevations on the USGS Oakland East Quadrangle (7.5 Minute Series). The top of casing elevations of monitoring wells MW-1 and MW-2 were surveyed relative to monitoring well MW-3. Each of these wells appeared to be constructed within the tank backfill and were screened from the total depth all the way to the surface.

Prior to purging water from any site well, ASE measured the static depth to groundwater in each well using an electric water level sounder. Top of casing elevations relative to a site datum, depth to groundwater data and groundwater elevation data are tabulated in Table One.

TABLE ONE
Summary of Groundwater Well Survey Data

Well I.D.	Date of Measurement	Top of Casing Elevation (project datum)	Depth to Water (feet)	Groundwater Elevation (project datum)
MW-1	02-04-99	599.03	4.76	594.27
MW-2	02-04-99	599.01	4.73	594.28
MW-3	02-04-99	600.00	5.73	594.27

The water table beneath the site appeared to be completely flat with only 0.01-foot difference between the highest and lowest groundwater elevation calculated for the site.

4.0 GROUNDWATER SAMPLE COLLECTION AND ANALYSIS

Prior to sampling, monitoring well MW-3 was purged of four well casing volumes of water using an electric PVC pump. The pH, temperature and conductivity of the purged water were monitored during the well purging, and samples were not collected until these parameters stabilized. Groundwater samples were collected from the well using dedicated polyethylene bailers. No sheen or hydrocarbon odors were present at the time of the groundwater purging and sampling.

The samples were decanted from the bailers into 40-ml volatile organic analysis (VOA) vials, preserved with hydrochloric acid, capped, labeled and placed into an ice chest containing wet ice for transport to Chromalab, Inc. of Pleasanton, California (ELAP #1094) under chain-of-custody. Well sampling field logs are presented in Appendix A.

The groundwater samples were analyzed for TPH-G by EPA Method 5030/8015M and BTEX and MTBE by EPA Method 8020. The analytical results are presented in Table Two, and the certified laboratory report and chain-of-custody form are included as Appendix B. The analytical reports from Kiff Analytical of Davis, California for the October 1998 sampling by Penn Environmental are presented in Appendix C.

TABLE TWO
Summary of Chemical Analysis of GROUNDWATER Samples
All results are in parts per billion

Well/ Sample Date	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl- Benzene	Total Xylenes	MTBE
<u>MW-1</u> 10-13-98	68	<50	<100	<0.5	<0.5	<0.5	<0.5	48
<u>MW-2</u> 10-13-98	<50	<50	<100	<0.5	<0.5	<0.5	<0.5	12
<u>MW-3</u> 02-04-99	<50	---	---	<0.5	<0.5	<0.5	<0.5	<5.0

Notes:

Detectable concentrations are in **bold**.

Non-detectable concentrations are noted by the less than sign (<) followed by the detection limit.

No lead or volatile organic compounds were detected in groundwater samples collected from monitoring wells MW-1 and MW-2.

5.0 WASTE OIL TANK OVEREXCAVATION CONFIRMATION SAMPLING

On February 4, 1998, Penn Environmental overexcavated contaminated soil surrounding the former waste oil tank. This soil was previously removed but was placed back into the excavation temporarily. This soil was once again removed from the excavation to be transported for disposal. On February 5, 1999, ASE senior geologist Robert Kitay collected confirmation soil samples from two sidewalls of the excavation. Sidewall samples were collected since the bottom of the excavation was saturated. These samples were collected from a backhoe bucket from a depth of approximately 5.5-feet below ground surface (the capillary zone) and placed in laboratory supplied glass containers. These samples were then labeled and placed into an ice chest containing wet ice for transport to Chromalab, Inc. of Pleasanton, California (ELAP #1094) under chain-of-custody. The soil samples were analyzed for TPH-G by EPA Method 5030/8015M, TPH-D and TPH-MO by EPA Method 3510/8015M and BTEX and MTBE by EPA Method 8020. These analyses were requested by Mr. Hernan Gomez of the Oakland Fire Department in a telephone conversation on February 4, 1999. The analytical results are presented in

Table Three, and the certified laboratory report and chain-of-custody form are included as Appendix B.

TABLE THREE
 Summary of Chemical Analysis of **CONFIRMATION SOIL** Samples
 All results are in **parts per million**

Sample I.D.	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE
OVEX-SW-1	<1.0	<1.0	<50	<0.005	<0.005	<0.005	<0.005	<0.005
OVEX-SW-2	<1.0	<1.0	<50	<0.005	<0.005	<0.005	<0.005	0.040

Notes:

Detectable concentrations are in **bold**.

Non-detectable concentrations are noted by the less than sign (<) followed by the detection limit.

6.0 CONCLUSIONS AND RECOMMENDATIONS

No hydrocarbons were detected in groundwater samples collected from monitoring well MW-3. In October 1998, groundwater samples collected from monitoring wells MW-1 and MW-2 contained 48 and 12 parts per billion (ppb) MTBE, respectively. The concentration of 48 ppb MTBE in the groundwater sample collected from monitoring well MW-1 was just over the California Department of Toxic Substances Control (DTSC) interim action level for drinking water of 35 ppb. No BTEX was detected in any of the groundwater samples. In addition, only a low MTBE concentration (0.040 parts per million) was detected in the confirmation soil samples that ASE collected from the waste oil tank excavation. Based on these analytical results, and the flat groundwater gradient at the site, it is ASE's opinion that there are no significant environmental conditions at the site, and the site appears suitable for closure.

Since the groundwater monitoring wells at the site are screened to the surface in areas near the USTs, ASE recommends that these wells be properly destroyed immediately since they could potentially act as a conduit for any potential future surface contamination to reach the subsurface.

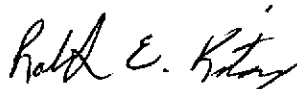
7.0 REPORT LIMITATIONS

The results of this report represent the conditions at the time of the soil and groundwater sampling, at the specific locations where the samples were collected, and for the specific parameters analyzed by the laboratory. It does not fully characterize the site for contamination resulting from sources other than the former underground storage tanks and associated plumbing at the site, or for parameters not analyzed by the laboratory. All of the laboratory work cited in this report was prepared under the direction of independent CAL-EPA certified laboratory. The independent laboratory is solely responsible for the contents and conclusions of the chemical analysis data. This report also refers to analytical results of samples collected by parties other than ASE. ASE has assumed that this data is correct for the purposes of this report and that the samples were representative of site conditions. However, ASE can accept no responsibility for the accuracy of that data and any conclusions based on that data must be the responsibility of the consultants which collected the samples and the analytical laboratory which analyzed the samples.

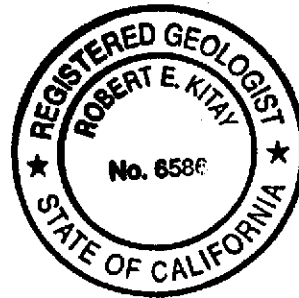
Aqua Science Engineers appreciates the opportunity to provide environmental consulting services for this project, and trust that this report meets your needs. Please feel free to call us at (925) 820-9391 if you have any questions or comments.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.



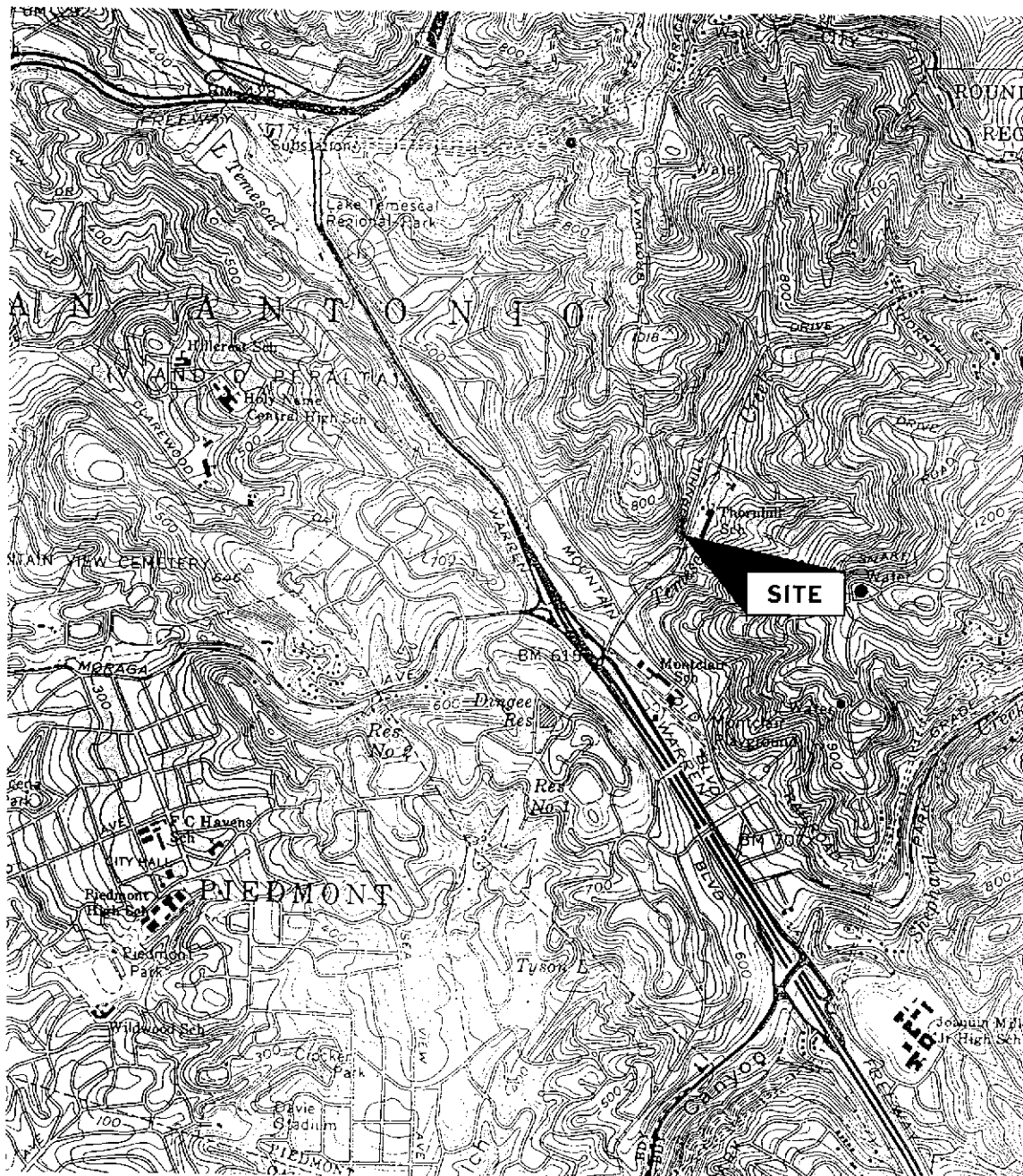
Robert E. Kitay, R.G., R.E.A.
Senior Geologist



Attachments: Figures 1 and 2
Appendices A through C



NORTH

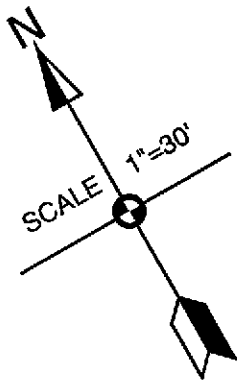


SITE LOCATION MAP

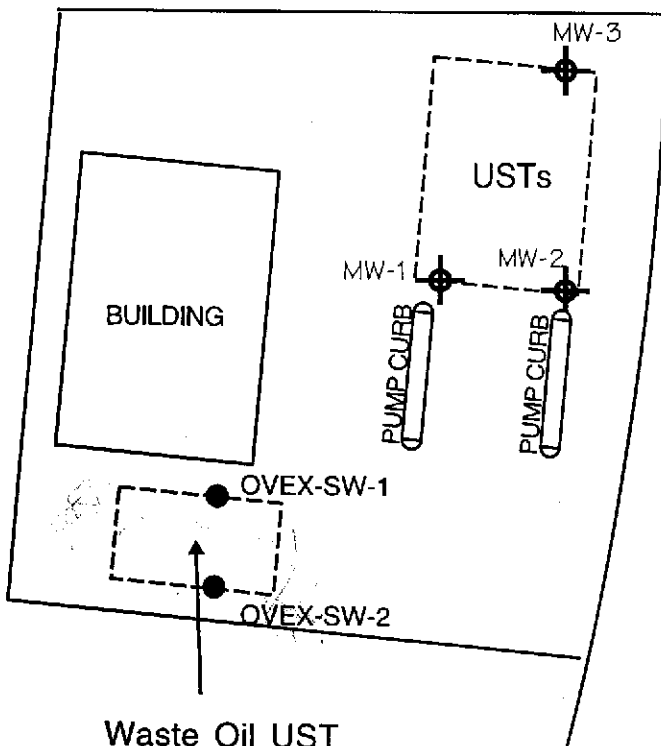
Mash Petroleum
5725 Thornhill Street
Oakland, California

AQUA SCIENCE ENGINEERS, INC.

Figure 1





7-11 STORE



THORNHILL DRIVE

Waste Oil UST
Excavation

Legend

-  Monitoring well location
-  Sidewall confirmation sample

SITE MAP

Mash Petroleum
5725 Thornhill Drive
Oakland, CA

APPENDIX A

Well Sampling Field Logs



WELL SAMPLING FIELD LOG

Project Name and Address: Mo. Mashhoon, 5725 Thornhill Dr., Oakland
 Job #: 3457 Date of sampling: 2-4-99
 Well Name: MW-3 Sampled by: PK
 Total depth of well (feet): 11.47 Well diameter (inches): 4
 Depth to water before sampling (feet): 5.73
 Thickness of floating product if any: None
 Depth of well casing in water (feet): 5.74
 Number of gallons per well casing volume (gallons): 3.8
 Number of well casing volumes to be removed: 4
 Req'd volume of groundwater to be purged before sampling (gallons): 15.2
 Equipment used to purge the well: 12 volt PVC pump
 Time Evacuation Began: 10:30 Time Evacuation Finished: 10:50
 Approximate volume of groundwater purged: 16 gal
 Did the well go dry?: No After how many gallons: —
 Time samples were collected: 11:00
 Depth to water at time of sampling: ✓
 Percent recovery at time of sampling: ✓
 Samples collected with: New polyethylene bail
 Sample color: None (clear) Odor: None
 Description of sediment in sample: None

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
<u>Initial</u>	<u>59.3</u>	<u>5.95</u>	<u>1675</u>
<u>4 gals</u>	<u>59.8</u>	<u>6.35</u>	<u>1880</u>
<u>8 gals</u>	<u>59.1</u>	<u>6.50</u>	<u>1700</u>
<u>12 gals</u>	<u>59.4</u>	<u>6.50</u>	<u>1660</u>
<u>16 gals</u>	<u>59.3</u>	<u>6.50</u>	<u>1680</u>

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
<u>MW-3</u>	<u>3</u>	<u>40-ml VOA's</u>	<u>Yes</u>	<u>Yes</u>	<u>TPH-C/BTEX/MTBE</u>

APPENDIX B

Certified Laboratory Report
and
Chain of Custody Forms

CHROMALAB, INC.

Environmental Services (SDB)

February 11, 1999

Submission #: 9902073

AQUA SCIENCE ENGINEERS, INC

Atten: Robert Kitay

Project: MO-MASHHOON-THORNHILL
Received: February 5, 1999

re: One sample for Gasoline BTEX MTBE analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: MW-3

Spl#: 227684


Matrix: WATER


Sampled: February 4, 1999

Run#:17304

Analyzed: February 8, 1999

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	50	N.D.	106	1
MTBE	N.D.	5.0	N.D.	97	1
BENZENE	N.D.	0.50	N.D.	105	1
TOLUENE	N.D.	0.50	N.D.	104	1
ETHYL BENZENE	N.D.	0.50	N.D.	102	1
XYLENES	N.D.	0.50	N.D.	98	1


Vincent Vancil
Analyst


Michael Verona
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

February 11, 1999

Submission #: 9902073

AQUA SCIENCE ENGINEERS, INC

Atten: Robert Kitay

Project: MO-MASHHOON-THORNHILL
Received: February 5, 1999

re: One sample for Gasoline BTEX MTBE analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: OVEX-SW-1

Spl#: 227685

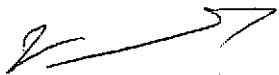
Matrix: SOIL

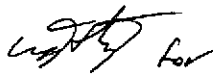
Sampled: February 5, 1999

Run#:17300

Analyzed: February 8, 1999

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	1.0	N.D.	86	1
MTBE	N.D.	0.0050	N.D.	89	1
BENZENE	N.D.	0.0050	N.D.	100	1
TOLUENE	N.D.	0.0050	N.D.	97	1
ETHYL BENZENE	N.D.	0.0050	N.D.	99	1
XYLENES	N.D.	0.0050	N.D.	100	1


Vincent Vancil
Analyst


Michael Verona
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

February 11, 1999

Submission #: 9902073

AQUA SCIENCE ENGINEERS, INC

Atten: Robert Kitay

Project: MO-MASHHOON-THORNHILL

Received: February 5, 1999

re: One sample for Gasoline BTEX MTBE analysis.

Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: OVEX-SW-2

Spl#: 227686

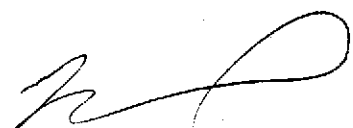
Matrix: SOIL

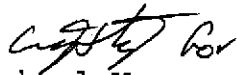
Sampled: February 5, 1999

Run#:17317

Analyzed: February 8, 1999

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	1.0	N.D.	105	1
MTBE	0.040	0.0050	N.D.	105	1
BENZENE	N.D.	0.0050	N.D.	100	1
TOLUENE	N.D.	0.0050	N.D.	98	1
ETHYL BENZENE	N.D.	0.0050	N.D.	99	1
XYLENES	N.D.	0.0050	N.D.	97	1


Vincent Vancil
Analyst


Michael Verona
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

February 12, 1999

Submission #: 9902073

AQUA SCIENCE ENGINEERS, INC

Atten: Robert Kitay

Project: MO-MASHHOON-THORNHILL
Received: February 5, 1999

re: 2 samples for TEPH analysis.
Method: EPA 8015M

Sampled: February 5, 1999 Matrix: SOIL Extracted: February 8, 1999
Run#: 17305 Analyzed: February 9, 1999

Spl#	CLIENT SPL ID	Diesel (mg/Kg)	Motor Oil (mg/Kg)
227686	OVEX-SW-2	N.D.	N.D.

Sampled: February 5, 1999 Matrix: SOIL Extracted: February 8, 1999
Run#: 17305 Analyzed: February 11, 1999

Spl#	CLIENT SPL ID	Diesel (mg/Kg)	Motor Oil (mg/Kg)
227685	OVEX-SW-1	N.D.	N.D.

Reporting Limits	1.0	50
Blank Result	N.D.	
Blank Spike Result (%)	91.1	--


Carolyn House
Analyst


Bruce Havlik
Analyst

Aqua Science Engineers, Inc.
 208 W. El Pintado Road
 Danville, CA 94526
 (925) 820-9391
 FAX (925) 837-4853

44458

Chain of Custody

PAGE 1 OF 1

SAMPLER (SIGNATURE) Robert E. Kitzky (PHONE NO.) (925) 820-9391

PROJECT NAME Mo. Mashbaan - Thornhill JOB NO. _____
 ADDRESS 5725 Thornhill Drive, Oakland, CA DATE 2-5-99

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 5030/8015-8020)	TPH-GASOLINE (EPA 5030/8015)	TPH-DIESEL + MOTOR OIL (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	PURGEABLE AROMATICS (EPA 602/8020)	VOLATILE ORGANICS (EPA 624/8240)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520)	LUFT METALS (5) (EPA 6010+7000)	CAM 17 METALS (EPA 6010+7000)	PCBs & PESTICIDES (EPA 608/8080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140)	ORGANOCHLORINE HERBICIDES (EPA 8150)	FUEL OXYGENATES (EPA 8260)					COMPOSITE		
MW-3	2/4	11:00	Water	3	X																				
CVEX-SW-1	2/5	9:30	Soil	1	X		X																		
CVEX-SW-2	2/5	9:35	Soil	1	X		X																		

SURN #: 9902073 REP: PM
 CLIENT: ASE
 DUE: 02/12/99
 REF #: 44458

RELINQUISHED BY:
Robert E. Kitzky 13:55
 (signature) (time)
Robert E. Kitzky 2-5-99
 (printed name) (date)
 Company- ASE

RECEIVED BY:
Gary Cook 13:55
 (signature) (time)
Gary Cook 2/5/99
 (printed name) (date)
 Company- Chromab

RELINQUISHED BY:
Gary Cook 14:25
 (signature) (time)
Gary Cook 2/5/99
 (printed name) (date)
 Company-

RECEIVED BY LABORATORY:
(Signature)
 (signature) (time)
Cassidy 14:30
 (printed name) (date)
 Company- 2-5-99

COMMENTS:
 5-DAY T.A.T.
 3.3°C AP
 2 jars
 3 VOAS

APPENDIX C

Analytical Results
from
Previous Sampling

FROM : MO MASHHOON
1-25-1999 3:43PM

FAX NO. : 510 3380482
FROM EMERGENCY_SERVICES 5102387761

Jan. 26 1999 05:26PM P7

P. 3

From: Joel Kiff To: Penn Environmental

Date: 1/12/99 Time: 10:07:14 AM

Page 1 of 8

DEC-18-88 WED 16:44

KIFF ANALYTICAL

FAX NO. 5302974808

P. 01/06

KIFF
ANALYTICAL LLC

Report Number: 12640

Date: 12/16/98

Eric Zemb
Penn Environmental
1261 Travis Blvd., Suite 380
Fairfield, CA 94533

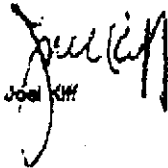
Subject : 3 Soil Samples
Project Name : Thornhill Tank Pull
Project Number : PE98-2270

Dear Mr. Zemb,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,


Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800



Report Number : 12495

Date : 10/16/98

Project Name : Thornhill

Project Number :

Sample : TH01398-01

Matrix : Water

Sample Date : 10/13/98

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8020	10/15/98
Toluene	< 0.50	0.50	ug/L	EPA 8020	10/15/98
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8020	10/15/98
Total Xylenes	< 0.50	0.50	ug/L	EPA 8020	10/15/98
Methyl-t-butyl ether	48	5.0	ug/L	EPA 8020	10/16/98
TPH as Gasoline	68	50	ug/L	M EPA 8015	10/15/98
TPH as Diesel	< 50	50	ug/L	M EPA 8015	10/15/98
TPH as Motor Oil	< 100	100	ug/L	M EPA 8015	10/15/98
Lead	< 0.0050	0.0050	mg/L	EPA 7421	10/15/98
o,o-Difluorotoluene (8020 Surrogate)	104		% Recovery	EPA 8020	10/15/98
o,o-Difluorotoluene (Gasoline Surrogate)	92.3		% Recovery	M EPA 8015	10/15/98

Sample : TH01398-02

Matrix : Water

Sample Date : 10/13/98

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8020	10/15/98
Toluene	< 0.50	0.50	ug/L	EPA 8020	10/15/98
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8020	10/15/98
Total Xylenes	< 0.50	0.50	ug/L	EPA 8020	10/15/98
Methyl-t-butyl ether	12	5.0	ug/L	EPA 8020	10/15/98
TPH as Gasoline	< 50	50	ug/L	M EPA 8015	10/15/98
TPH as Diesel	< 50	50	ug/L	M EPA 8015	10/15/98
TPH as Motor Oil	< 100	100	ug/L	M EPA 8015	10/15/98
Lead	< 0.0050	0.0050	mg/L	EPA 7421	10/15/98
o,o-Difluorotoluene (8020 Surrogate)	105		% Recovery	EPA 8020	10/15/98
o,o-Difluorotoluene (Gasoline Surrogate)	93.1		% Recovery	M EPA 8015	10/15/98

Approved By:  Joel Kiff

DEC-16-98 WED 16:46

KIFF ANALYTICAL

FAX NO. 5302874803

P. 05/06



Report Number : 12840

Date : 12/16/98

Project Name : Thornhill Tank Pull

Project Number : PESS-2276

Sample : 112898-803 A,B,C,D

Matrix : Soil

Sample Date : 11/26/98

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
1,1,2-Trichloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Tetrachloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Dibromochloromethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Chlorobenzene	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
1,1,1,2-Tetrachloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Ethylbenzene	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
P,M-Xylene	0.028	0.020	mg/Kg	EPA 8240A	12/10/98
O-Xylene	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Styrene	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Bromoforn	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
1,1,2,2-Tetrachloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
1,3-Dichlorobenzene	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
1,4-Dichlorobenzene	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
1,2-Dichlorobenzene	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Acetone	0.48	0.20	mg/Kg	EPA 8240A	12/10/98
2-Butanone	< 0.20	0.20	mg/Kg	EPA 8240A	12/10/98
4-Methyl-2-Pentanone	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
2-Hexanone	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Dibromofluoromethane (Surr)	98.5		% Recovery	EPA 8240A	12/10/98
1,2-Dichloroethane-d4 (Surr)	99.0		% Recovery	EPA 8240A	12/10/98
Toluene - d8 (Surr)	96.7		% Recovery	EPA 8240A	12/10/98
4-Bromofluorobenzene (Surr)	105		% Recovery	EPA 8240A	12/10/98

Approved By: 
Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4600

From: Joel Kiff To: Penn Environmental

Date: 1/12/99 Time: 10:07:14 AM

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DEC-16-98 WED 16:48

KIFF ANALYTICAL

FAX NO. 5302974803

P. 04/06



Report Number : 12840

Date : 12/16/98

Project Name : Thornhill Tank Full

Project Number : P258-2275

Sample : 112505-003 A,B,C,D

Matrix : Soil

Sample Date : 11/25/98

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.020	0.020	mg/Kg	EPA 8250B	12/10/98
Toluene	0.030	0.020	mg/Kg	EPA 8250B	12/10/98
Ethylbenzene	< 0.020	0.020	mg/Kg	EPA 8250B	12/10/98
Total Xylenes	0.038	0.020	mg/Kg	EPA 8250B	12/10/98
Methyl-t-butyl ether	0.080	0.020	mg/Kg	EPA 8250B	12/10/98
TPH as Gasoline	5.9	5.0	mg/Kg	EPA 8250B	12/10/98
TPH as Diesel	< 20	20	mg/Kg	M EPA 8015	12/05/98
TPH as Motor Oil	210	200	mg/Kg	M EPA 8015	12/05/98
1-Chlorooctadecane (Diesel Surrogate)	Diluted Out		% Recovery	M EPA 8015	12/05/98
Toluene - d6 (Surr)	96.7		% Recovery	EPA 8250B	12/10/98
4-Bromofluorobenzene (Surr)	105		% Recovery	EPA 8250B	12/10/98
Chloromethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Vinyl Chloride	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Bromomethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Chloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Trichlorofluoromethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
1,1-Dichloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Methylene Chloride	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
trans-1,2-Dichloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
1,1-Dichloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
cis-1,2-Dichloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Chloroform	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
1,1,1-Trichloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
1,2-Dichloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Carbon Tetrachloride	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Benzene	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Trichloroethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
1,2-Dichloropropane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Bromodichloromethane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
cis-1,2-Dichloropropane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98
Toluene	0.080	0.020	mg/Kg	EPA 8240A	12/10/98
trans-1,3-Dichloropropane	< 0.020	0.020	mg/Kg	EPA 8240A	12/10/98

Approved By:  Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

From: Joel Kiff To: Penn Environmental

Date: 1/12/99 Time: 10:07:14 AM

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DEC-16-98 WED 18:45

KIFF ANALYTICAL

FAX NO. 5302874603

P. 03/06



Report Number : 10840

Date : 12/16/98

Project Name : Thornhill Tank Pull

Project Number : PE98-2276

Sample : 112598-002

Matrix : Soil

Sample Date : 11/28/98

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.20	0.20	mg/Kg	EPA 8260B	12/10/98
Toluene	< 0.20	0.20	mg/Kg	EPA 8260B	12/10/98
Ethylbenzene	< 0.20	0.20	mg/Kg	EPA 8260B	12/10/98
Total Xylenes	< 0.20	0.20	mg/Kg	EPA 8260B	12/10/98
Methyl-t-butyl ether	< 0.20	0.20	mg/Kg	EPA 8260B	12/10/98
TPH as Gasoline	440	20	mg/Kg	EPA 8260B	12/10/98
TPH as Diesel	1200	20	mg/Kg	M EPA 8015	12/05/98
TPH as Motor Oil	820	200	mg/Kg	M EPA 8015	12/05/98
1-Chlorooctadecane (Diesel Surrogate)	Diluted Out		% Recovery	M EPA 8015	12/05/98
Toluene - d8 (Sur)	99.0		% Recovery	EPA 8260B	12/10/98
4-Bromofluorobenzene (Sur)	119		% Recovery	EPA 8260B	12/10/98

Approved By:  Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-287-4800

From: Joel Kiff To: Penn Environmental

Date: 11/25/98 Time: 10:11:14 AM

Page 2 of 6

DEC-18-98 WED 18:45

KIFF ANALYTICAL

FAX NO. 5302974803

P. 02/08



Report Number : 12040

Date : 12/16/98

Project Name : Thornhill Tank Pull

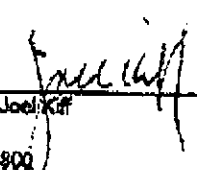
Project Number : PE98-2278

Sample : 112328-801

Matrix : Soil

Sample Date : 11/25/98

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.20	0.20	mg/Kg	EPA 8260B	12/10/98
Toluene	< 0.20	0.20	mg/Kg	EPA 8260B	12/10/98
Ethylbenzene	< 0.20	0.20	mg/Kg	EPA 8260B	12/10/98
Total Xylenes	< 0.20	0.20	mg/Kg	EPA 8260B	12/10/98
Methyl-t-butyl ether	< 0.20	0.20	mg/Kg	EPA 8260B	12/10/98
TPH as Gasoline	1100	20	mg/Kg	EPA 8260B	12/10/98
TPH as Diesel	2700	20	mg/Kg	M EPA 8016	12/08/98
TPH as Motor Oil	4200	200	mg/Kg	M EPA 8016	12/08/98
1-Chlorodecane (Diesel Surrogate)	Unltd Out		% Recovery	M EPA 8016	12/08/98
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/10/98
4-Bromofluorobenzene (Surr)	131		% Recovery	EPA 8260B	12/10/98

Approved By:  Joel Kiff

720 Olive Drive, Suite D, Davis, CA 95615 530-297-4800

12840

Page 1 of 1

KIFF ANALYTICAL
LLC

200 Glina Drive, Suite D
Daly, CA 94016

Lab: 916.297.4800
Fax: 916.297.4808

Project Manager: **MR. ERIC J. ZAMB**
Phone No: **(707) 428-1995**

Company/Reference: **PEN N ENVIRONMENTAL**
Fax No: **(707) 428-0257**

Project Number: **PE98-2276**
P.O. No: _____

Project Name: **THORNHILL TANK FILL**
Project Location: **5725 THORNHILL, OAKLAND CA**

Chain-of-Custody Record and Analysis Request

Analysis Request

Sample Designation	Sampling		Container (Type/Amount)		Method Preserved				Matrix	BTEX (MSD)	BTEX/THC (MSD)	THC as Diesel (MSD)	THC as Motor Oil (MSD)	EPA 010	EPA 008 - PCBs	EPA 009 - PCBs	EPA 010	EPA 011	WEI (X)		DATE	For Lab Use Only
	Date	Time	SOX	SLURRY	IL CLAS	SOX	HCl	HNO3											ICE	NOHF		
112598-801	11/27	MOB	1							/	/	/									11/27/98	-01
112598-802	11/27	FIX	1							/	/	/									11/27/98	-02
12598-803A,B,C,D	11/26	ASD	4							/	/	/									11/26/98	-03

Requested by: *[Signature]*

Requested by: _____

Requested by: _____

Date: 12/24/98 Time: 12:50pm

Date: _____ Time: _____

Date: 12/24/98 Time: 12:50pm

Received by: _____

Received by: _____

Received by: *Mary Cabot*

Remarks: Sample Temp. @ 11:02 upon receipt and 12/24/98

Sample # 112598-803A,B,C,D is a 4-pint sample

Email address: _____

400 516 106 other _____

OWE to: _____

Distribution: White - Lab, Yellow - Pre, Pink - Operator

CCC:ms

FROM EMERGENCY SERVICES 510228/61

1-26-1999 3:48PM FROM MO MASHOON (KIFF ANALYTICAL)

DEC-16-98 WED 10:47 KIFF ANALYTICAL

LAB: 112598 (MO MASHOON)

FAX NO. 5102974808

P. 06/06

1499 6 016