BLYMYER ENGINEERS, INC.
1829 Clement Avenue
Alameda, California 94501-1396
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ENVIRONMENTAL PROTECTION
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LETTER OF TRANSMITTAL

DATE February 9, 2000	BEI Job No. 94015
ATTENTION:	John Kawahara
SUBJECT:	Kawahara Nursery
	16550 Ashland Avenue
	San Lorenzo, California
	Site # 4403

Kawahara Nursery
698 Burnett Avenue
Morgan Hill, CA 95037

Resp. not to 2/16/2000

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- ☐ Copy of letter
- ☐ Report
- ☐ Prints
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- ☐ Work Order
- ☐ Change Order
- ☐ Specifications
- ☐ ________________

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1	1/24/00		Blymyer Engineers; Report; *Quarterly Groundwater Monitoring Report Fourth*
			Quarter 1999

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Mr. Amir Gholami, Alameda County Health Care Services Agency

SIGNED: Mark Detterman

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Quarterly Groundwater Monitoring Report
Fourth Quarter 1999

Kawahara Nursery
16550 Ashland Avenue
San Lorenzo, California
Site # 4403

January 24, 2000 BEI Job No. 94015

Prepared by:

Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501

Client:

Kawahara Nursery, Inc.
16550 Ashland Avenue
San Lorenzo, CA 94508

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Limitations

Services performed by Blymyer Engineers, Inc. have been provided in accordance with generally accepted professional practices for the nature and conditions of similar work completed in the same or similar localities, at the time the work was performed. The scope of work for the project was conducted within the limitations prescribed by the client. This report is not meant to represent a legal opinion. No other warranty, expressed or implied, is made. This report was prepared for the sole use of Kawahara Nursery, Inc.

Blymyer Engineers, Inc.

By: ______________________

Mark E. Detterman C.E.G.
Senior Geologist

REGISTERED GEOLOGIST
MARK E. DETTERMAN
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CERTIFIED ENGINEERING GEOLOGIST
7/01
STATE OF CALIFORNIA

And: ______________________

Michael S. Lewis
Vice President, Technical Services

Table of Contents

Tables

Figures

Appendices

1.0 Introduction

1.1 Previous Work

1.1.1 Underground Storage Tank Removal

On December 1, 1992, one steel 5,000-gallon underground storage tank (UST) was removed from the property owned by Kawahara Nursery, located at 16550 Ashland Avenue, San Lorenzo, California, (Figure 1). The UST, used to store diesel, was reported to be in good condition at the time of removal with no visible evidence of holes. However, soil samples collected from the UST excavation contained Total Petroleum Hydrocarbons (TPH) as diesel, suggesting that a release had occurred. The results of the UST closure were described in the *Underground Storage Tank Closure Report*, prepared by Tank Protect Engineering.

According to information obtained from Kawahara Nursery, a 1,000-gallon gasoline UST was previously located in the vicinity of the lath house on the north side of the property (Figure 2). The UST was reportedly removed from the site shortly after Kawahara Nursery occupied the property in 1954.

1.1.2 Phase I Site Investigation

In a letter dated January 27, 1993, the Alameda County Health Care Services Agency (ACHCSA) requested that a preliminary subsurface investigation be completed to ascertain the extent of soil and groundwater contamination at the site. On June 10, 1993, Blymyer Engineers supervised the installation of three groundwater monitoring wells (MW-1, MW-2, and MW-3) and one soil bore (SB-1). Minor concentrations of petroleum hydrocarbons were detected in the soil samples collected from soil bores MW-1 and MW-2, and higher concentrations were detected in the samples collected near the water-bearing zone in soil bore MW-3. The groundwater sample collected from monitoring well MW-3, located adjacent to an on-site irrigation well, contained TPH as gasoline and benzene, toluene, ethylbenzene, and xylenes (BTEX).

1.1.3 Phase II Site Investigation

In response to Blymyer Engineers' *Preliminary Site Assessment, Phase I Subsurface Investigation* report and *Subsurface Investigation Status Report*, the ACHCSA requested full delineation of the extent of petroleum hydrocarbons in groundwater at the site and in the soil adjacent to the diesel UST excavation. In 1994, Blymyer Engineers conducted a second phase of investigation at the site consisting of:

- A review of records at the ACHCSA and the Regional Water Quality Control Board to determine if any toxic chemical or fuel leaks reported within a ¼-mile radius may have impacted the site
- A review of historical aerial photographs
- Field tests to assess whether pumping of the on-site irrigation well would influence the shallow water-bearing zone
- A 16-point soil gas survey
- Installation of two additional groundwater monitoring wells (MW-4 and MW-5)
- Collection of groundwater samples from all five monitoring wells during the first three quarters of 1995

Results of the second phase of investigation were presented in Blymyer Engineers' *Subsurface Investigation Letter Report*, dated December 16, 1994 and in quarterly groundwater monitoring reports submitted in 1995.

No potential upgradient sources of contamination were identified during the review of the local regulatory agency records and aerial photographs. On the basis of the limited field tests, pumping of the irrigation well did not have a significant influence on shallow groundwater beneath the site. Furthermore, petroleum hydrocarbons were not detected in the groundwater samples collected from the irrigation well, which is apparently screened from 45 to 60 feet below ground surface (bgs).

Slightly elevated concentrations of petroleum hydrocarbons were detected in the soil gas samples collected from the northeastern corner of the barn and near the northernmost lath house. Groundwater samples from MW-3, located between the lath house and the barn, contained up to 120,000 micrograms per liter (μg/L) TPH as gasoline, 4,800 μg/L of benzene, 8,400 μg/L of toluene, 3,000 μg/L of ethylbenzene, and 27,000 μg/L of total xylenes. The presence of TPH as gasoline in groundwater samples from MW-3 suggested that there was another source of petroleum hydrocarbons at the site, in addition to the diesel UST that was removed in 1992.

TPH as diesel was detected in the MW-5 groundwater sample only during the March 1995 sampling event. TPH as gasoline, TPH as diesel, and BTEX were not detected in groundwater samples collected from monitoring wells MW-1, MW-2, or MW-4. The direction of groundwater flow in September 1995 was estimated to be northwest with an average gradient of 0.004 feet/foot.

On the basis of the *Subsurface Investigation Letter Report* and quarterly groundwater monitoring reports, the ACHCSA requested (in a letter dated May 31, 1995) that Kawahara Nursery conduct additional work at the site. Specifically, they requested submittal of a workplan to identify the source and extent of contamination in soil and groundwater in the vicinity of monitoring well MW-3.

On June 3, 1997, Blymyer Engineers submitted the *Workplan for Additional Site Characterization and Site Risk Classification* (Workplan) to the ACHCSA. In a letter dated June 6, 1997, the ACHCSA requested that several additional tasks be included in the Workplan. On June 12, 1997, Blymyer Engineers submitted the *Revised Workplan for Additional Site Characterization* (Revised Workplan), which addressed the additional ACHCSA requirements.

The Revised Workplan included the following tasks:

- Resumption of quarterly groundwater monitoring and sampling of MW-3, MW-4, and MW-5

- Generation of a geophysical survey in an attempt to locate the gasoline UST or its former basin in the vicinity of the lath house on the north side of the site

- Perform an additional investigation in the vicinity of the former gasoline UST by advancing approximately 6 direct-push soil bores

- Decommission monitoring wells MW-1 and MW-2, as approved by the ACHCSA

- Analyze soil and groundwater samples to evaluate the potential for natural attenuation (aerobic and anaerobic biodegradation)

- Determine if the site can be classified in the "low risk groundwater" category as defined by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB)

- If appropriate, evaluate the risk to human health and the environment

On March 4, 1999, Blymyer Engineers resumed quarterly groundwater monitoring and sampling of MW-3, MW-4, and MW-5, and submitted the *Quarterly Groundwater Monitoring Report, First Quarter 1999 (January through March)*, dated April 13, 1999.

In June 1999, prior to implementation of the Revised Workplan, Mr. Amir Gholami of the ACHCSA requested (June 2, 1999) the addition of the following tasks to the above scope of work (see Blymyer Engineers' *Proposed Soil Bore Locations*, dated June 21, 1999):

- Drill two additional soil bores on the west side and east side of monitoring well MW-3

- Drill additional soil bores around the perimeter of the former diesel UST and in the vicinity of geophysical anomalies

- Collect soil samples at five-foot intervals and collect one grab groundwater sample from each soil bore

1.1.4 Additional Subsurface Investigation

On September 2, 1999, Blymyer Engineers submitted the *Results of Additional Subsurface Investigation and Quarterly Groundwater Monitoring, Second Quarter 1999.* This report presented the results the geophysical survey, additional soil bore sampling, well decommissioning, and groundwater monitoring for the second quarter, 1999. In addition to decommissioning monitoring wells MW-1 and MW-2, as approved by the ACHCSA, the following conclusions were made:

- The direction of groundwater flow is toward the northwest

- On the basis of the geophysical survey, buried metal objects appear to be present in two locations near the west end of the lath house

- Soil and grab groundwater samples collected from SB-4 and SB-5, located downgradient of one magnetic anomaly, contained very high concentrations of petroleum hydrocarbons

- A petroleum sheen was observed on SB-4 and SB-5 water samples, and free product was observed in the soil samples

- Groundwater samples from MW-3, located between the barn and the northernmost lath house, contained significant concentrations of TPH as gasoline and benzene

- The soil samples and grab groundwater sample collected downgradient of the former diesel UST (removed in 1992) indicated that this area is not a significant source of groundwater contamination

On the basis of the investigation, it appears that there may be free product present in soil and groundwater in the vicinity of the lath house (downgradient of one magnetic anomaly). The site could not, therefore, be classified as "low risk groundwater".

Furthermore, the concentrations of benzene were compared to the Tier 1 table of Risk-Based Screening Levels (RBSLs) as described in the ASTM E 1739-95 *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (RBCA). A California-modified toxicity and exposure table was used. Benzene concentrations in groundwater samples from SB-4, SB-5, and MW-3 exceed the target levels for an exposure pathway of groundwater volatilization to indoor residential air. Because there is a residence immediately downgradient of the apparent gasoline source, closure of this site could not be recommended on the basis of a low risk to human health.

Blymyer Engineers recommended that a Tier 2 RBCA evaluation be generated to evaluate site-specific target levels (SSTLs) for both soil and groundwater. When the SSTLs are generated, it was recommended that the remaining petroleum hydrocarbon sources be removed from the site, using the SSTLs as cleanup goals.

Blymyer Engineers has been retained to conduct a Tier 2 RBCA evaluation of the site.

2.0 Data Collection

On November 11, 1999, Blaine Tech Services, Inc. (Blaine) conducted groundwater gauging and sampling at the Kawahara Nursery under contract to Blymyer Engineers. The Blaine *Standard Operating Procedures* for groundwater gauging and sampling are included in Appendix A.

2.1 Groundwater Gauging

Blaine personnel measured the depth to groundwater in wells MW-3, MW-4, and MW-5 (Figure 3). The groundwater was gauged with an accuracy of 0.01 feet from the top of casing using an oil-water interface probe. Groundwater measurements are presented in Table I and Figure 3, and are included on the Well Gauging and Well Monitoring Data Sheets presented in Appendix B.

2.2 Groundwater Sampling and Analysis

Blaine collected groundwater samples from wells MW-3, MW-4, and MW-5. Prior to purging the wells, the dissolved oxygen content was measured using a field instrument. Each well was then purged by removing a minimum of three well casing volumes of groundwater. The temperature, pH, turbidity, and conductivity of the purge water were measured after each well volume had been removed. The amount of groundwater purged from each well was considered sufficient when the parameters appeared to be stable.

Groundwater samples were collected from each monitoring well, then decanted into the appropriate containers. The samples were labeled and placed in a cooler with ice for transport to Entech Analytical Labs, Inc. (Entech) of Sunnyvale, California, under chain-of-custody documentation. All purged groundwater was placed in labeled, 55-gallon capacity, Department of Transportation-approved steel drums. The samples were to be analyzed for the following compounds:

- TPH as gasoline (EPA Method 8015M)
- TPH as diesel (EPA Method 8015M)
- BTEX (EPA Method 8020).
- Methyl tert-butyl ether (MTBE; EPA Method 8020)
- Carbon dioxide (EPA Method 310.1)
- Dissolved ferrous iron (SM 3500)
- Nitrate-Nitrogen (EPA Method 353.3)
- Alkalinity (EPA Method 310.1)
- Sulfate (EPA Method 375.4)

3.0 Results

3.1 Groundwater Elevations and Gradient

Table I and Figure 3 present groundwater gauging data collected on November 11, 1999. The depth to groundwater ranged from 9.18 feet below the top of casing (BTOC) in monitoring well MW-5 to 11.00 feet BTOC in MW-4. The average groundwater gradient was 0.003 feet/foot. The direction of groundwater flow could not be conclusively be determined based on the linear configuration of the wells. However, the gradient is likely to be directed toward the northwest based on the historic flow direction documented at the site.

3.2 Groundwater Sample Analytical Results

Results of groundwater analyses are presented in Appendix C, and are summarized in Table II and Table III. Groundwater samples from monitoring wells MW-4 and MW-5 did not contain TPH as gasoline, TPH as diesel, BTEX, or MTBE concentrations above the detection reporting limits (DRLs).

The sample from MW-3 contained 4,200 μg/L TPH as gasoline, 2,000 μg/L TPH as diesel, 63μg/L benzene, 25 μg/L toluene, 65 μg/L ethylbenzene, 590 μg/L xylenes, and 33 μg/L MTBE. In comparison to the June 1999 groundwater sampling event, the concentrations of petroleum hydrocarbons were lower except for TPH as diesel and ethylbenzene during the November 1999 sampling event. Although TPH as diesel was reported as present, the laboratory noted that the chromatographic pattern was not typical for fuel. As a consequence, Blymyer Engineers requested the laboratory to review the TPH as diesel chromatogram. Entech verbally confirmed that the TPH as diesel detected was overlap from the TPH as gasoline chromatogram, that the chromatogram suggested that a single hydrocarbon pattern was present, and that this set of data likely indicated aged gasoline was present, and that a second source of diesel was not present. Because TPH as diesel is not present as a separate release in the northern portion of the site, Blymyer Engineers recommends that TPH as diesel be dropped from the analytical suite for future monitoring events.

The presence of MTBE has not been confirmed by gas chromatograph/mass spectrometer (GC/MS) analysis at this site yet. EPA Method 8020 can give false positives for MTBE, as MTBE will coelute with 3-methyl-pentane, another gasoline compound. The reported age of the UST that stored gasoline at the site indicates that the gasoline stored at the site likely predates the introduction of MTBE into gasoline; however, the apparently rising concentrations of MTBE present in groundwater at the site indicate that the presence of MTBE should be confirmed by a one-time analysis by a GC/MS method such as EPA Method 8260.

Table III presents the analytical results of natural attenuation indicators. Microbial use of petroleum hydrocarbons as a food source is affected by the concentration of a number of chemical compounds dissolved in groundwater at a site. In the order of preference, the following electron acceptors are used by microbes to degrade petroleum hydrocarbons: oxygen, nitrate, ferric iron (Fe^{3+}) to ferrous iron (Fe^{2+}), sulfate, and methane (*Supporting a Ground Water and Soil Natural Remediation Proposal*, Sharon McLelland, in *Site Remediation News*, a publication of the New Jersey Department of Environmental Protection Site Remediation Program, March 1996). Analysis of each of these electron acceptors, except methane, was conducted at the site as part of the preliminary evaluation of natural attenuation chemical parameters.

Microbial use of petroleum hydrocarbons as a food source is principally affected by the concentration of dissolved oxygen (DO) in the groundwater present at a site; it is the preferable electron acceptor for the biodegradation of hydrocarbons. DO was present in pre-purge groundwater in concentrations ranging from 0.5 milligrams per liter (mg/L) in monitoring well MW-3 to 1.4 mg/L in the groundwater sample from MW-4. DO at the site is highest upgradient of the presumed metallic objects, decreases in the vicinity of well MW-3, and is intermediate at well MW-5. The depleted oxygen concentrations in groundwater from MW-3 indicate that natural attenuation is likely proceeding under slightly anaerobic conditions. The apparent rise of DO concentrations in well MW-5 downgradient from well MW-3 may indicate that aerobic conditions are being reestablished downgradient of well MW-3.

Because oxygen appeared to be in insufficient supply in groundwater in well MW-3, (denitrifying conditions), nitrate concentrations were evaluated at the site. In denitrifying conditions, nitrate concentrations decrease in the contaminant plume over background nitrate concentrations. This trend is present in site wells. As with the concentrations for DO, nitrate concentrations begin to rise in well MW-5, likely again indicating incipient reestablishment of aerobic conditions downgradient of well MW-3.

Because nitrate was utilized in well MW-3 at the site, as discussed above, ferrous iron concentrations were also evaluated at the site. Detectable concentrations of ferrous iron were not present in groundwater samples from any wells since monitoring for this parameter was begun in March 1999. These results are likely indicative of an adequately aerobic environment, where DO or nitrate is in sufficient supply such that ferric iron (Fe^{+3}) has not been reduced to ferrous iron (Fe^{+2}) as an alternative electron acceptor for the oxidation of the petroleum hydrocarbons.

Sulfate concentrations were also evaluated at the site as part of the preliminary evaluation of natural attenuation chemical parameters. If utilized by the microbes, sulfate concentrations, like nitrate concentrations, decrease in the contaminant plume over background sulfate concentrations. This trend has not previously been observed at the site, although during the present groundwater sampling event, sulfate reduction was marginally observed. This may indicate periodic marginally sulfate reducing conditions may be present at the site. The data suggest that this occurs late in the year prior to significant rainfall recharge of groundwater and the resulting DO concentration rise in groundwater. As with the concentrations for DO and nitrate, the sulfate concentrations begin to rise in well MW-5, likely indicating incipient reestablishment of aerobic conditions downgradient of well MW-3.

At the site, higher concentrations of CO_2 relative to DO indicate that microbial respiration is occurring as DO is being depleted. On average, the concentration of CO_2 is lowest relative to DO in well MW-3, highest in upgradient well MW-4, and intermediate in downgradient well MW-5. This is the same trend as seen previously for other chemical parameters at the site. It suggests significant microbial activity in the vicinity of well MW-3 and decreased activity in groundwater obtained from well MW-5 due to the significantly lower hydrocarbon concentrations, thus allowing a recovery to background CO_2 concentrations in the aquifer.

Trends over time, and between wells, for alkalinity (higher levels with aerobic biodegradation) suggest similar trends for alkalinity as for the other monitored parameters at the site.

Natural attenuation indicators will continue to be monitored to assess the average concentrations of the indicators.

4.0 Conclusions and Recommendations

The following conclusions can be made from the on-going groundwater monitoring events:

- Of the three monitoring wells sampled, only the sample from MW-3 contained detectable concentrations of petroleum hydrocarbons; the contaminant appears to be predominantly gasoline rather than diesel.

- Except for concentrations of TPH as diesel and ethylbenzene, the contaminant concentrations detected in MW-3 were lower than those detected during the June 1999 sampling event.

- Because TPH as diesel is not present as a separate release in the northern portion of the site, TPH as diesel should be dropped from the analytical suite for future monitoring events.

- The direction of groundwater flow is likely to to the northwest based on previously generated data.

- An evaluation of natural attenuation chemical parameters present at the site appears to indicate that anaerobic conditions are present in the heart of the contaminant plume. Aerobic degradation of the hydrocarbons appears to be undergoing reestablishment prior to flow of the groundwater beneath the onsite residential dwelling or offsite.

- The reported age of the UST that stored gasoline at the site indicates that the gasoline stored at the site likely predates the introduction of MTBE into gasoline; however, the apparently rising concentrations of MTBE present in groundwater at the site indicate that the presence of MTBE should be confirmed by a one-time analysis by a GC/MS method such as EPA Method 8260.

A copy of this report has been forwarded to:

Mr. Amir Gholami
Alameda County Health Care Services Agency
Environmental Protection Division
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Table I, Summary of Groundwater Elevation Measurements
BEI Job No. 94015, Kawahara Nursery, Inc.
16550 Ashland Avenue, San Lorenzo, California

Well ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
MW-1	6/16/93	100	10.7	89.3
	3/24/94		11.11	88.89
	3/28/94		11.26	88.74
	11/22/94		12.04	87.96
	3/29/95		7.26	92.74
	6/7/95		8.67	91.33
	9/7/95		10.56	89.44
	3/4/99		Not Measured	Not Measured
	6/29/99		8.81	91.19
	11/15/99		Destroyed	Destroyed
MW-2	6/16/93	99.27	10.24	89.03
	3/24/94		10.65	88.62
	3/28/94		10.79	88.48
	11/22/94		11.58	87.69
	3/29/95		6.93	92.34
	6/7/95		8.36	90.91
	9/7/95		10.18	89.09
	3/4/99		6.95	92.32
	6/29/99		8.52	90.75
	11/15/99		Destroyed	Destroyed
MW-3	6/16/93	99.52	10.46	89.06
	3/24/94		10.81	88.71
	3/28/94		10.96	88.56
	11/22/94		11.68	87.84
	3/29/95		6.95	92.57
	6/7/95		8.48	91.04
	9/7/95		10.30	89.22
	3/4/99		7.98	91.54
	6/29/99		8.49	91.03
	11/15/99		10.35	89.17

Table I, Summary of Groundwater Elevation Measurements BEI Job No. 94015, Kawahara Nursery, Inc. 16550 Ashland Avenue, San Lorenzo, California				
Well ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
MW-4	11/22/94	100.46	12.34	88.12
	3/29/95		7.49	92.97
	6/7/95		8.95	91.51
	9/7/95		10.88	89.58
	3/4/99		8.03	92.43
	6/29/99		9.04	91.42
	11/15/99		11.00	89.46
MW-5	11/22/94	98.14	10.42	87.72
	3/29/95		5.76	92.38
	6/7/95		7.33	90.81
	9/7/95		9.11	89.03
	3/4/99		6.63	91.51
	6/29/99		7.41	90.73
	11/15/99		9.18	88.96

Notes: TOC = Top of casing
Elevations in feet above mean sea level

Table II, Summary of Groundwater Sample Hydrocarbon Analytical Results
BEI Job No. 94015, Kawahara Nursery
16550 Ashland Avenue, San Lorenzo, California

Sample ID	Date	Modified EPA Method 8015 (μg/L)		EPA Method 8020 (μg/L)				
		TPH as Gasoline	TPH as Diesel	B	T	E	X	MTBE
MW-1	6/16/93	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/28/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	11/8/94	NS	NS	NS	NS	NS	NS	NS
	3/29/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	6/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/4/99	NS	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS	NS
	11/15/99	NS	NS	NS	NS	NS	NS	NS
MW-2	6/16/93	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/28/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	11/8/94	NS	NS	NS	NS	NS	NS	NS
	3/29/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	5/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/4/99	NS	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS	NS
	11/15/99	NS	NS	NS	NS	NS	NS	NS
MW-3	6/16/93	**120,000**	**170,000**	**4,600**	**8,400**	**2,100**	**27,000**	NS
	3/28/94	**23,000**	**94,000**	**4,800**	**6,500**	**3,000**	**15,000**	NS
	11/8/94	**35,000**	**27,000**	**3,600**	**4,100**	**2,700**	**18,000**	NS
	3/29/95	**18,000**	<50*	**1,600**	**1,400**	**780**	**6,200**	NS
	6/7/95	**20,000**	<50	**1,700**	**1,400**	**750**	**6,800**	NS
	9/7/95	**17,000**	<50	**1,100**	**800**	**570**	**4,800**	NS
	3/4/99	**1,300**	<50	**33**	<0.5	**1.2**	**17**	**5.3**
	6/29/99	**8,000**	<1,000	**98**	**34**	**3.7**	**1,200**	**37**
	11/15/99	**4,200**	**2,000**[a]	**63**	**25**	**65**	**590**	**33**

Table II, Summary of Groundwater Sample Hydrocarbon Analytical Results
BEI Job No. 94015, Kawahara Nursery
16550 Ashland Avenue, San Lorenzo, California

Sample ID	Date	Modified EPA Method 8015 (μg/L)		EPA Method 8020 (μg/L)				
		TPH as Gasoline	TPH as Diesel	B	T	E	X	MTBE
MW-4	6/16/93	NS	NS	NS	NS	NS	NS	NS
	3/28/94	NS	NS	NS	NS	NS	NS	NS
	11/8/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/29/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	6/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/4/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	6/29/99	**130**	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	11/15/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
MW-5	6/16/93	NS	NS	NS	NS	NS	NS	NS
	3/28/94	NS	NS	NS	NS	NS	NS	NS
	11/8/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/29/95	<50	**64**	<0.5	<0.5	<0.5	<0.5	NS
	6/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/4/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	6/29/99	**160**	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	11/15/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0

Notes:
μg/L = Micrograms per liter
TPH = Total Petroleum Hydrocarbons
B = Benzene
T = Toluene
E = Ethylbenzene
X = Total Xylenes
MTBE = Methyl tert-butyl ether
NS = Not Sampled
<x = Less than the analytical detection limit (x)
EPA = Environmental Protection Agency
* = Laboratory reported the presence of petroleum hydrocarbons with a chromatograph pattern uncharacteristic of diesel fuel
[a] = Laboratory note indicates the result is within the quantitation range, but that the chromatographic pattern is not typical of fuel

Table III, Summary of Groundwater Sample Natural Attenuation Analytical Results
BEI Job No. 94015, Kawahara Nursery
16550 Ashland Avenue, San Lorenzo, California

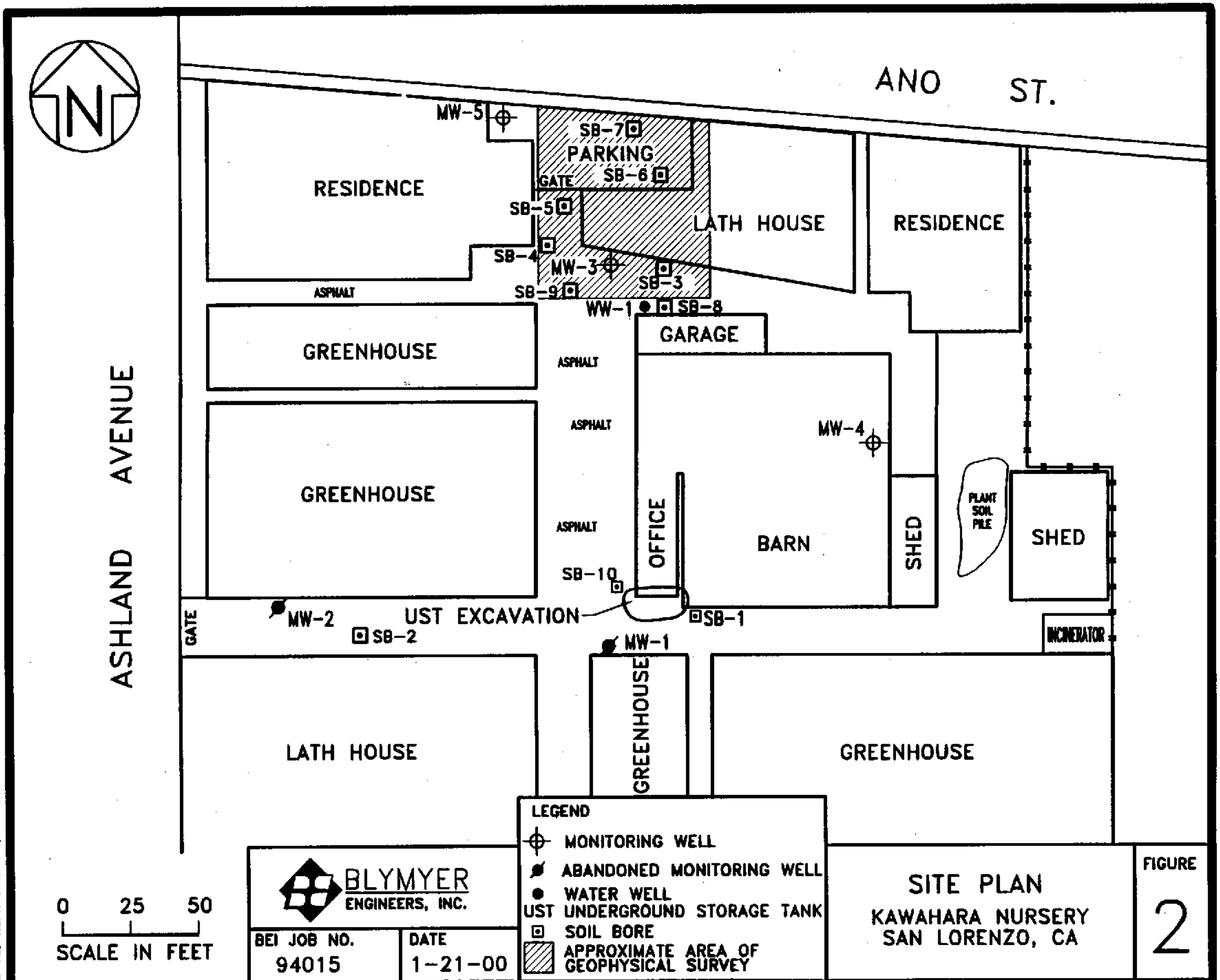
Sample ID	Date	EPA Method 310.1	Standard Method 3500	EPA Method 353.3	EPA Method 310.1	EPA Method 375.4	Field
		Carbon Dioxide (mg/L)	Ferrous Iron (mg/L)	Nitrate/ Nitrogen (mg/L)	Alkalinity (mg/L)	Sulfate (mg/L)	Dissolved Oxygen (mg/L)
MW-1	3/4/99	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS
	11/15/99	NS	NS	NS	NS	NS	NS
MW-2	3/4/99	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS
	11/15/99	NS	NS	NS	NS	NS	NS
MW-3	3/4/99 3/8/99	4.4	<0.01	26	520	1,000	1.2
	6/29/99	3.5	<0.10	10	500	73	0.4
	11/15/99	48	<0.01	5.7	530	110	0.5
MW-4	3/4/99 3/8/99	2.3	<0.01	13	320	390	2.1
	6/29/99	21	<0.10	12	360	46	1.2
	11/15/99	22	<0.01	8.9	370	140	1.4
MW-5	3/4/99 3/8/99	2.1	<0.01	140	370	500	1.8
	6/29/99	7.0	<0.10	14	360	46	0.9
	11/15/99	6.0	<0.01	11	370	150	0.9

Notes: NS = Not sampled
Field = Field instruments used for measurement of parameter
mg/L = Milligrams per liter

UNITED STATES GEOLOGICAL SURVEY 7.5' QUADS. "SAN LEANDRO, CA" AND "HAYWARD, CA" BOTH ED. 1959 , PHOTOREVISED 1980.

QUADRANGLE LOCATION

BLYMYER ENGINEERS, INC.	0 1000 2000 SCALE IN FEET	N	SITE LOCATION MAP KAWAHARA NURSERY 16550 ASHLAND AVE. SAN LORENZO, CA	FIGURE 1
BEI JOB NO. 94015 — DATE 4-9-99				



LEGEND

- MONITORING WELL
- ABANDONED MONITORING WELL
- WATER WELL
- UST UNDERGROUND STORAGE TANK
- SOIL BORE
- APPROXIMATE AREA OF GEOPHYSICAL SURVEY

BLYMYER ENGINEERS, INC.

BEI JOB NO. 94015

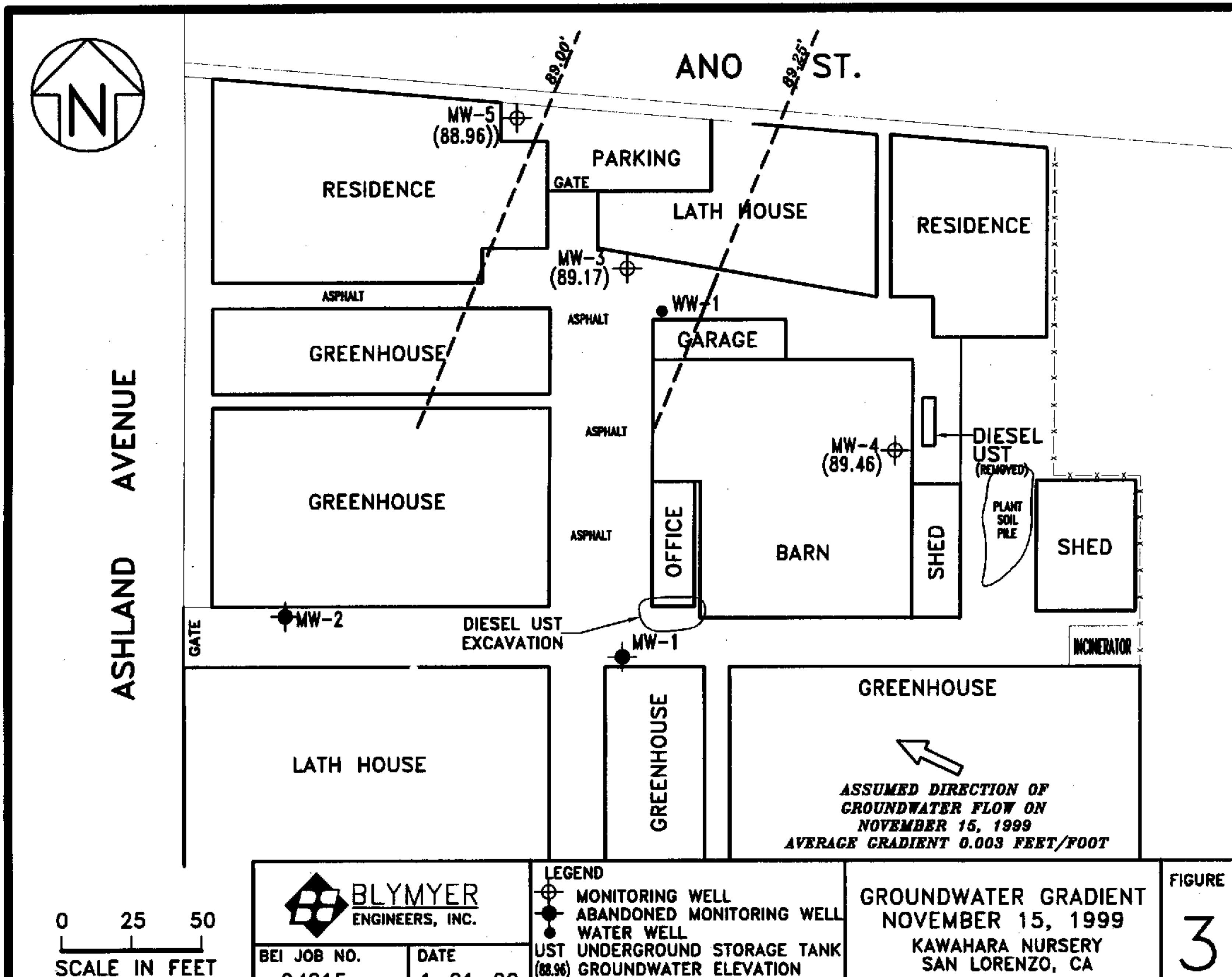
DATE 1-21-00

SITE PLAN

KAWAHARA NURSERY
SAN LORENZO, CA

FIGURE 2

ACADLW\940152E 1"=50 lw 1-21-00



BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
94015	1-21-00

LEGEND
- MONITORING WELL
- ABANDONED MONITORING WELL
- WATER WELL
- UST UNDERGROUND STORAGE TANK
- (88.96) GROUNDWATER ELEVATION
- GROUNDWATER CONTOUR

GROUNDWATER GRADIENT
NOVEMBER 15, 1999
KAWAHARA NURSERY
SAN LORENZO, CA

FIGURE 3

1-21-00 \ACADLW\940153E 1"=50' LW

Appendix A:

Standard Operating Procedures

Blaine Tech Services, Inc.

SUMMARY OVERVIEW OF

STANDARD OPERATING PROCEDURES

FOR THE ROUTINE MONITORING OF GROUNDWATER WELLS

APPLIES TO WELLS WHICH ARE SAMPLED AND ANALYZED
FOR COMPOUNDS ASSOCIATED WITH
PETROLEUM FUELS,
HEAVY METALS,
CHLORINATED SOLVENTS AND
PRIORITY POLLUTANTS
AND OTHER COMMON CONTAMINANTS
RELATED TO INDUSTRY, AGRICULTURE, COMMERCE AND LANDFILL OPERATIONS

REVISED AND REISSUED SEPTEMBER 10, 1995

1. OBJECTIVE INFORMATION

Blaine Tech Services, Inc. performs specialized environmental sampling and documentation as an independent third party. We intentionally limit the scope of our activities and are primarily engaged in the execution of technical assignments which generate objective information. To avoid conflicts of interest which might compromise our impartiality, Blaine Tech Services, Inc. makes no recommendations, does not participate in the interpretation of analytical results and performs no consulting of any kind.

2. SPECIFIC ASSIGNMENTS

All work is performed in accordance with the specific request, authorization and informed consent of the client who may be the property owner, the responsible party or the professional consultant overseeing work at the particular site. The scope of services is defined in individual one-time work orders or in contracts which reference compliance with regulatory requirements, particular client specifications and conformance with our own Standard Operating Procedures. Decisions about what work will be done, how the work will be done and the sequence of events are established in advance of sending personnel to the site. Except where particular procedures and equipment are specified in advance, the determination of how to best complete the individual tasks which comprise the assignment is left to the discretion of our field personnel.

3. INSPECTION AND GAUGING

Wells are inspected prior to evacuation and sampling. The condition of the wellhead will be checked and noted in the degree of detail requested by the client. Measurements include the depth to water and the total well depth obtained with industry standard electronic sounders which are graduated in increments of tenths of a foot and hundredths of a foot. The surface of the water in each well is further inspected for the presence of immiscibles and any separate phase hydrocarbon layer is measured in situ with an electronic interface probe and confirmed by visual inspection of the separate phase material in a clear acrylic bailer.

Notations are entered in blank areas on forms provided for the collection of instrument readings and included in the specially prepared field notebook. Data collected in the course of our work may be presented in a TABLE OF WELL MONITORING DATA prepared by our personnel or passed to the client or consultant in their original form on the field data sheets.

4. ADEQUATE PURGE STANDARD

Minimum purge volumes and purge completion standards are established by the interested regulatory agency controlling groundwater monitoring in each particular jurisdiction and by the consultant reviewing technical work performed on the project for submission to the interested regulatory agency. Depth to water measurements are collected by our personnel prior to purging and minimum purge volumes are calculated anew for each well based on the height of the water column and the diameter of the well. Expected purge volumes are never less than three case volumes and are set at no less than four case volumes in several jurisdictions.

5. STABILIZED PARAMETERS

Completion standards include minimum purge volumes, but additionally require stabilization of normal groundwater parameters. Normal groundwater parameter readings include electrical conductivity (EC), pH, and temperature which are obtained at regular intervals during the evacuation process (no less than once per case volume) and at the time of sample collection.

Temperature is considered to have stabilized when successive readings do not fluctuate more than +/- 1 degree Celsius. Electrical conductivity is considered stable when successive readings are within 10%. pH is thought to be stable when successive readings remain constant or vary no more than 0.2 of a pH unit.

Additional completion standards are used in some jurisdictions. Turbidity of <50 NTU is such a completion standard.

6. DEWATERED WELLS

Normal evacuation removes no less than three case volumes of water from the well. However, less water may be removed in cases where the well dewaters and does not recharge.

In a typical accommodation procedure worked out between the consultants and the regulatory agency, a well which does not recharge to 80% of its original volume within two hours (and any additional time our personnel have reason to remain at the site) will require our personnel to return to the site within twenty four hours to sample the well. In such cases, our personnel return to the site within the prescribed time limit and collect sample material from the water which has flowed back into the well case without regard to what percentage of the original volume this recharge represents.

There are also instances in which the client, consultant and regulators agree that it is better to collect certain types of water samples (for volatile constituents) from the available water remaining in a dewatered well rather than let the water stand for prolonged periods of times and risk the loss of volatile constituents. These arrangements are client specific and are contained in client directives to our personnel. These are carried as printed directives in reference binders in the sampling vehicle and are on file at our office for use by our project coordination personnel.

7. PURGEWATER CONTAINMENT

All purgewater evacuated from each groundwater monitoring well is captured and contained as are all fluids form the on-site decontamination of reusable apparatus (sounders, electric pumps and hoses etc.). Hazardous materials are placed in appropriately labeled DOT drums and left at the site for handling by a licensed hazardous waste hauler who will move the material to a TSDF. Non-hazardous purgewater will be drummed or discharged into an on-site treatment system. Non-hazardous effluent from petroleum industry sites is typically collected in vehicle mounted tanks and transported to the nearest refinery operated by the client.

8. EVACUATION

Wells are purged prior to sampling with a variety of evacuation devices. Small diameter wells which contain a relatively small volume of water are often hand bailed. Larger volumes of water found in deeper wells and larger diameter wells are removed with down hole electric submersible pumps or pneumatic purge pumps.

In a typical evacuation, the well is pumped with a Grundfos brand electrical pump deployed into the well on a long section of hose which is paid out form a reel assembly mounted on the sampling vehicle.

Specialized evacuation devices such as USGS Middleburg bladder pumps can be used in response to special circumstances, but unless specifically dictated by the client, consultant or regulator, the type of device used to evacuate the well will be selected based on its appropriateness and efficiency.

9. SAMPLE COLLECTION DEVICES

Irrespective of the type of device used to evacuate the well, samples are always collected with a specialized sampling bailer. Standard sampling bailers are constructed of either stainless steel or PTFE (Teflon®). Some clients request that their samples be obtained with disposable bailers which are made from a variety of materials (PTFE, polyethylene, PVC etc.) which are represented by the manufacturer to be adequate and appropriate for one time use applications after which the disposable bailer is discarded.

Regardless of the type of bailer used to collect sample material, the number of check valves the bailer contains or the presence or absence of a bottom emptying device, the water which is the sample material is promptly decanted into new sample containers in a manner which reduces the loss of volatile constituents and follows the applicable EPA standard for handling volatile organic and semi-volatile compounds.

The exceptions to this rule are samples which must be field filtered (i.e. for metals) prior to preservation or those that must be fixed or manipulated in the field (e.g. Winkler titration). Such samples are handled according to procedures described in STANDARD METHODS, the SW-846 and other texts.

10. SAMPLE CONTAINERS

Sample material is decanted directly from the sampling bailer into sample containers provided by the laboratory which will analyze the samples. The transfer of sample material from the bailer to the sample container conforms to specifications contained in the USEPA T.E.G.D. The type of sample container, material of construction, method of closure and filling requirements are specific to intended analysis. Chemicals needed to preserve the sample material are commonly already placed inside the sample containers by the laboratory or glassware vendor. The number of replicates is set by the laboratory.

11. QC BLANKS

QC blanks are collected in accordance with the regimen agreed upon by the interested parties and typically include trip blanks, duplicates and equipment blanks.

12. CHAIN OF CUSTODY RECORDS

All samples are labeled and logged on a standardized Chain of Custody form. The Blaine Tech Services, Inc., preprinted Chain of Custody form is a multi-page carbonless form, whereas client and laboratory forms are usually single pages which are replicated by making photocopies. All Chain of Custody forms follow standard EPA conventions set forth in USEPA SW-846 for recording the time, date and signature of the person collecting the samples, and go further to require paired time, date and responsible party entries each time the samples change hands.

According to this convention, each time the samples move from the custody of one person to another person, the Chain of Custody form must record the time, date and signature of the person relinquishing custody of the samples and the time data and signature of the person accepting custody of the samples.

In practice, all samples are continuously maintained in an appropriate cooled container while in our custody and until delivered to the laboratory under a standard Chain of Custody form. If the samples are taken charge of by a different party (such as another person from our office, or a courier who will transport the samples to the laboratory) prior to being delivered to the laboratory, appropriate release and acceptance entries must be made on the Chain of Custody form (time, date, and signature of the person releasing the samples followed by the time, date and signature of the person taking possession of the samples).

13. SAMPLE STORAGE

All sample containers are promptly placed in food grade ice chests for storage in the field and transport (direct or via our facility) to the analytical laboratory which will perform the intended analytical procedures. These ice chests contain quantities of ice as a refrigerant material. The samples are maintained in either an ice chest or a refrigerator until relinquished into the custody of the laboratory or laboratory courier.

14. ICE

Temperature in the ice chest is lowered and maintained with ice. Our firm produces ice in a restaurant grade commercial ice maker which is supplied with deionized water which has been filtered and polished and is the same grade of water tanked on our sampling vehicles for use in decontamination procedures.

15. DOCUMENTATION CONVENTIONS

All sample containers are identified with a site designation and a discrete sample identification number specific to that particular groundwater well. Additional standard notations (e.g. time, date, sampler) are also made on the label.

Each and every sample container has a label affixed to it. In most cases these labels are generated by our office personnel and are partially preprinted. Labels can also be hand written by our field personnel. The site is identified (usually with a code specified by the client), as is the particular groundwater well from which the sample is drawn (e.g. MW-1, MW-2, S-1, etc.). The time at which the sample was collected and the initials of the person collecting the sample are handwritten onto the label.

Our representative adds the Blaine Tech Services, Inc. Sampling Event Number. This Sampling Event Number also appears on the Chain of Custody form and all other notebook pages and papers associated with the work done at the site on the particular day by this particular technician. The Sampling Event Number also becomes the number of the Blaine Tech Services, Inc. Sampling Report.

The Sampling Event Number is derived form the date on which the work was done, the specific employee who did the work and what the relationship of this particular assignment was to any other assignments performed on that day by this specific employee.

An example Sampling Event Number is 950910-B-2.

The first six digits indicate the date (yymmdd) which is 950910 for September 10, 1995. The alpha character indicates the letter assigned to the specific employee doing the work (e.g. the letter B is assigned to Mr. Richard Blaine). The final digit indicates that this was the second sampling assignment performed by Mr. Blaine on that particular date.

16. DECONTAMINATION

All equipment is brought to the site in clean and serviceable condition and is cleaned after use is each well and before subsequent use in any other well. Equipment is decontaminated before leaving the site.

The primary decontamination device is a commercial steam cleaner. Because high temperature water retains heat better than does a jet of steam and poses fewer hazards to the operator, we have our steam cleaners detuned by the manufacturer to produce hot water several degrees below the transition to live steam.

The steam cleaner / hot pressure washer is operated with high quality deionized water which is produced at our facility and tanked on our sampling vehicle for use at remote sites.

Decontamination effluent is collected in the same onboard effluent tanks as are used to contain the effluent from purging the groundwater wells at the site. The decon effluent is handled in the same manner as groundwater from the well.

17. FREE PRODUCT SKIMMERS

A skimmer is a free product recovery device sometimes installed in wells with a free product zone on the surface of the water. The presence of the skimmer in the well often prevents normal well gauging and free product zone measurements. The Petro Trap brand 2.0" and 3.0" diameter skimmers which are used on some petroleum industry sites fall into the category of devices that obstruct the well to the extent of preventing normal gauging. Gauging at such sites is performed in accordance with specific directions from the professional consulting firm overseeing work at the site on behalf of the property owner or responsible party.

In cases where the consultant elects to have our personnel pull the skimmers out of the well and gauge the well, our personnel perform the additional task of draining the accumulated free product out of the Petro Trap before putting it back into the well. The recovered free product is measured and recorded. The notation on the amount of free product with subsequently be entered in the VOLUME OF IMMISCIBLES REMOVED column on the TABLE OF WELL GAUGING DATA in the next Blaine Tech Services, Inc. Sampling Report.

18. CERTIFIED LABORATORY

Samples are directed to analytical laboratories which have been certified by the California Department of Health Services as an authorized Hazardous Materials Testing Laboratory and that laboratory's name and DOHS HMTL number should be noted on the Chain of Custody form.

18. REPORTAGE

A typical groundwater monitoring assignment involves the work of several different firms and a series of reports are generated, beginning with a Blaine Tech Services, Inc. Sampling Report. The Sampling Report (whether in extended or abbreviated form) details the particulars of the work that was performed and either presents directly or references descriptions of the methodologies which were used.

An attachment to the Sampling Report is the Chain of Custody form which is a legal document which records that transfer of the samples from Blaine Tech Services, Inc. to the analytical laboratory which will analyze the samples. The laboratory completes its work and issues its own Certified Analytical Report presenting the results of the analyses they conducted. Both our Sampling Report and the laboratory's Analytical Report deal with the objective information. Neither the Sampling Report nor the Analytical Report interprets the data being reported.

Interpretations are provided by professional geologists and engineers who are working as environmental consultants. The consultant reviews the measurements made by our field personnel and plots an updated groundwater gradient map. The most recent analytical results are compared to earlier results to establish trends and information about the presence of various compounds in the groundwater. Anomalous data are examined with reference to our field data sheets to see if our notes indicate changed site conditions.

In general, the consultant is charged with making sense of the objective information and deciding what it may mean to the property owner and to the people to the State of California. The consultant signs off on is or her review of the objective information, makes whatever recommendations are appropriate and submits the assembled package of related documents to the regulatory agency on behalf of the property owner or responsible party.

The individual reports from Blaine Tech Services, Inc. and the analytical laboratory are distinct objective information documents, linked together by the Chain of Custody. In contrast, groundwater gradient maps require professional judgements and adjustments and are, therefore, within the domain of the professional consultant. Any professional evaluations or recommendation are always made by the consultant under separate cover.

20. FIELD PERSONNEL

All Blaine Tech Services, Inc. field personnel are required to have 40 hours of initial training in Hazardous Waste Operations and Emergency Response per 29 CFR 1910. 120 with 8-hour annual refresher courses. They are also given an 8-hour BATT course in refinery safety orientation. They receive several days of on-the-job-training and are given additional in-house training which included study of all the applicable Codes of Safe Practices form our Injury and Illness Prevention Program, review of the written Hazard Communication Program, familiarization with our written Drug Alcohol Free Work Place Policy and orientation on the Blaine Tech Services, Inc. Comprehensive Quality Assurance Program.

Field personnel also receive 29 CFR 1910 Supervisor Training to better prepare them to establish safe work sites at remote locations and supervise their own work, including compliance with site specific Site Safety Plans (SSP). Client requirement binders and Standard Operating Procedures are also provided. Blaine Tech Services, Inc. Policies and extensive in house training materials covering Basics and Diverse Sampling Assignments are included in advance employee training.

Blaine Tech Services, Inc. field personnel routinely commence work at OSHA level D and can upgrade to appropriate levels of additional protection as needed. They maintain their personal protective equipment in accordance with OSHA requirements and the specific mandates of our Respiratory Protection Program. All field personnel are trained and expected to comply with the requirements of any site specific Safety Plan which is in effect at any given site. Our personnel are prepared and able to follow the directions of any Site Safety Officer (SS0) administering the Site Safety Plan and, in the absence of an SSO, can apply the pertinent provisions of the SSP to themselves and to other Blaine Tech Services, Inc. personnel.

21. WORK ORIENTATION

Blaine Tech Services, Inc. field personnel are chosen from applicants who usually have bachelors' degrees in the sciences, environmental studies or related fields. People from the observational sciences (like botanists) often do better field sampling than young engineers who want to learn consulting (and are encouraged to find work with a good consulting firm). We notice that we employ a disproportionate number of people with degrees in fire science.

The academic concentration, however, has proven less important than the broader aptitude, durability and willingness of the applicant to deal with the range of problems which attend executing exacting procedures in a noisy workplace largely unprotected from sun, wind and rain.

Put simply, there is a lot of physical work that surrounds the science. Those who succeed at field sampling are those who can manage the physical work, handle emergencies and make field repairs without losing track of the particular requirements of the procedure they are performing.

22. PLAIN BUT IMPORTANT

Blaine Tech Services, Inc. has concentrated on providing high quality environmental sampling and documentation for well over a decade. During that time we have contributed mechanical and procedural innovations, helped establish higher quality and performance standards and have assisted in the replacement of inefficient sole-source-vendor monopolies with the new practice of separating projects into identifiable modules in which professional, technical and contractor functions are evaluated, bid and awarded individually – on the basis of price and actual performance.

Real as these advances are, sampling remains unglamorous and even misunderstood. Some engineers have expressed the view that field sampling is such a menial activity that it may as well be performed by their newest employees who are paying their dues before being allowed to do *real* work such as data interpretation, computer modeling, and the design of remediation systems.

We assert the contrary view, that sample collection is at least as important as sample analysis in the laboratory. This is based on the fact that no amount of care in the laboratory can – retroactively – put back into a sample, the integrity and quality that has been lost by indifferent sample collection. It can even be argued that objective scientific information is *more credible* when it is produced by people who are wholly impartial and really have no interest in any particular outcome.

Blaine Tech Services, Inc. exists because there is technical work which needs to be done that is neither glamorous nor highly remunerative, but is still important enough that it needs to be done correctly.

Any questions can be directed to our senior project coordinator, Mr. Kent Brown who can be reached at: **(408) 573-0555.**

Select voice mail extension number **203.**

Appendix B:

Well Monitoring Data Sheet and *Well Gauging Data*

Blaine Tech Services, Inc.

dated November 15, 1999

WELL GAUGING DATA

Project # 991115-I3 Date 11-15-99 Client Blymyer eng

Site 16550 Ashland Ave San Lorenzo, CA

Well ID	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC
MW-3	2					10.35	19.28	TOC
MW-4	2					11.00	19.70	↓
MW-5	2					9.18	20.00	↓

WELL MONITORING DATA SHEET

Project #: 991115-I3	Client: Blymeyer eng.
Sampler: R.F.	Start Date: 11-15-99
Well I.D.: mw-3	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 19.78	Depth to Water: 10.35
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method: Bailer, (Disposable Bailer), Middleburg, Electric Submersible, Extraction Pump, Other: ________

Sampling Method: Bailer, (Disposable Bailer), Extraction Port, Other: ________

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius^2 * 0.163

1.4 (Gals.) X 3 = 4.2 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1203	68.4	7.4	1140	17	1.5	odor
1205	68.2	7.4	1150	14	3.0	slight sheen
1207	67.9	7.4	1140	9	4.5	

Did well dewater? Yes (No)	Gallons actually evacuated: 4.5
Sampling Time: 1210	Sampling Date: 11-15-99
Sample I.D.: mw-3	Laboratory: entech
Analyzed for: (TPH-G) (BTEX) (MTBE) (TPH-D)	Other: Alk, Nitrate / Nitrite, sulfate, CO2, d.s. Fe
Equipment Blank I.D.: @ Time	Duplicate I.D.:
Analyzed for: TPH-G BTEX MTBE TPH-D	Other:
D.O. (if req'd): Pre-purge: mg/L	Post-purge: mg/L
ORP (if req'd): Pre-purge: mV	Post-purge: mV

WELL MONITORING DATA SHEET

Project #: 991115-I3	Client: Blymeyer eng.
Sampler: P.T.	Start Date: 11-15-99
Well I.D.: MW-4	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 19.70	Depth to Water: 11.00
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method: Bailer, (Disposable Bailer), Middleburg, Electric Submersible, Extraction Pump, Other: ____

Sampling Method: Bailer, (Disposable Bailer), Extraction Port, Other: ____

1.3 (Gals.) X 3 = 3.9 Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1230	64.4	7.6	880	31	1.5	
1232	64.2	7.5	900	20	2.75	
1234	64.1	7.5	910	8	4.0	

Did well dewater? Yes (No)	Gallons actually evacuated: 4.0
Sampling Time: 1237	Sampling Date: 11-15-99
Sample I.D.: MW 4	Laboratory: entech
Analyzed for: (TPH-G) (BTEX) (MTBE) (TPH-D)	Other: Alk. nitrate/nitrite sulfate, CO2, d.ss. Fe, Iron
Equipment Blank I.D.: @ Time	Duplicate I.D.:
Analyzed for: TPH-G BTEX MTBE TPH-D	Other:
D.O. (if req'd): Pre-purge: mg/L	Post-purge: mg/L
ORP (if req'd): Pre-purge: mV	Post-purge: mV

WELL MONITORING DATA SHEET

Project #: 991115-J3	Client: Blymeyer eng
Sampler: P.F.	Start Date: 11-15-99
Well I.D.: mw-5	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 20.00	Depth to Water: 9.18
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method: Bailer, (Disposable Bailer), Middleburg, Electric Submersible, Extraction Pump, Other: ______

Sampling Method: Bailer, (Disposable Bailer), Extraction Port, Other: ______

1.7 (Gals.) X 3 = 5.1 Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1317	67.0	7.7	870	12	1.75	
1319	67.0	7.6	910	7	3.5	
1321	67.1	7.6	940	9	5.25	

Did well dewater? Yes (No)	Gallons actually evacuated: 5.25
Sampling Time: 1325	Sampling Date: 11-15-99
Sample I.D.: mw-5	Laboratory: entech
Analyzed for: (TPH-G) (BTEX) (MTBE) (TPH-D)	Other: alk, nitrate/nitrite, sulfate, CO2, diss. Ferr. Iron
Equipment Blank I.D.: @ Time	Duplicate I.D.:
Analyzed for: TPH-G BTEX MTBE TPH-D	Other:
D.O. (if req'd): (Pre-purge:) .9 mg/L	Post-purge: mg/L
ORP (if req'd): Pre-purge: mV	Post-purge: mV

Appendix C:

Analytical Laboratory Report

Entech Analytical Labs, Inc.

dated November 22, 1999

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

November 22, 1999

Mark Detterman
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501

DEC 1999

Order:	17576	**Date Collected:**	11/15/99
Project Name:		**Date Received:**	11/15/99
Project Number:	94015	**P.O. Number:**	Invoice to Blymyer
Project Notes:			

On November 15, 1999, 3 samples were received under documentented chain of custody. Results for the following analyses are attached:

Matrix	Test	Method
Liquid	Alkalinity, Total	EPA 310.1
	Carbon Dioxide	SM 4500-CO
	Gas/BTEX/MTBE	EPA 8015 MOD.
		EPA 8020
	Iron, Ferrous-Diss.	SM 3500 - Fe
	Nitrate as N	EPA 353.3
	Nitrite as N	EPA 353.3
	Sulfate	EPA 375.4
	TPH as Diesel	EPA 8015 MOD. (Extractable)

Chemical analysis of these samples has been completed. Summaries of the data are contained on the following pages. USEPA protocols for sample storage and preservation were followed.

Entech Analytical Labs, Inc. is certified by the State of California (#I-2346). If you have any questions regarding procedures or results, please call me at 408-735-1550.

Sincerely,

Michelle L. Anderson
Lab Director

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501
Attn: Mark Detterman

Date: 11/22/99
Date Received: 11/15/99
Project Name:
Project Number: 94015
P.O. Number: Invoice to Blymyer
Sampled By: Client

Certified Analytical Report

Order ID: 17576 **Lab Sample ID:** 17576-001 **Client Sample ID:** MW-3
Sample Time: 12:10 PM **Sample Date:** 11/15/99 **Matrix:** Liquid

Parameter	Result	DF	PQL	DLR	Units	Analysis Date	QC Batch ID	Method
Alkalinity, Total	530	1	2	2	mg/L	11/17/99	WAK991117	EPA 310.1
Carbon Dioxide	48	1	2	2	mg/L	11/19/99	WCO2991119	SM 4500-CO
Iron, Ferrous	ND	1	0.01	0.01	mg/L	11/15/99	WFE991115	SM 3500 - Fe
Nitrate as N	5.7	1	0.1	0.1	mg/L	11/17/99	WNO3991117	EPA 353.3
Nitrite as N	0.26	1	0.1	0.1	mg/L	11/15/99	WNO2991115	EPA 353.3
Sulfate	110	10	0.1	1	mg/L	11/15/99	WSO4991115	EPA 375.4

Order ID: 17576 **Lab Sample ID:** 17576-002 **Client Sample ID:** MW-4
Sample Time: 12:37 PM **Sample Date:** 11/15/99 **Matrix:** Liquid

Parameter	Result	DF	PQL	DLR	Units	Analysis Date	QC Batch ID	Method
Alkalinity, Total	370	1	2	2	mg/L	11/17/99	WAK991117	EPA 310.1
Carbon Dioxide	22	1	2	2	mg/L	11/19/99	WCO2991119	SM 4500-CO
Iron, Ferrous	ND	1	0.01	0.01	mg/L	11/15/99	WFE991115	SM 3500 - Fe
Nitrate as N	8.9	1	0.1	0.1	mg/L	11/17/99	WNO3991117	EPA 353.3
Nitrite as N	ND	1	0.1	0.1	mg/L	11/15/99	WNO2991115	EPA 353.3
Sulfate	140	10	0.1	1	mg/L	11/15/99	WSO4991115	EPA 375.4

Order ID: 17576 **Lab Sample ID:** 17576-003 **Client Sample ID:** MW-5
Sample Time: 1:25 PM **Sample Date:** 11/15/99 **Matrix:** Liquid

Parameter	Result	DF	PQL	DLR	Units	Analysis Date	QC Batch ID	Method
Alkalinity, Total	370	1	2	2	mg/L	11/17/99	WAK991117	EPA 310.1
Carbon Dioxide	6.0	1	2	2	mg/L	11/19/99	WCO2991119	SM 4500-CO
Iron, Ferrous	ND	1	0.01	0.01	mg/L	11/15/99	WFE991115	SM 3500 - Fe
Nitrate as N	11	1	0.1	0.1	mg/L	11/17/99	WNO3991117	EPA 353.3
Nitrite as N	ND	1	0.1	0.1	mg/L	11/15/99	WNO2991115	EPA 353.3
Sulfate	150	10	0.1	1	mg/L	11/15/99	WSO4991115	EPA 375.4

DF = Dilution Factor ND = Not Detected DLR = Detection Limit Reported PQL = Practical Quantitation Limit

Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)

Michelle L. Anderson, Laboratory Director

Environmental Analysis Since 1983

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501
Attn: Mark Detterman

Date: 11/22/99
Date Received: 11/15/99
Project: 94015
PO #:
Sampled By: Client

Certified Analytical Report

Liquid Sample Analysis:

Sample ID	MW-3			MW-4			MW-5				
Sample Date	11/15/99			11/15/99			11/15/99				
Sample Time	12:10			12:37			13:25				
Lab #	17576-001			17576-002			17576-003				
	Result	DF	DLR	Result	DF	DLR	Result	DF	DLR	PQL	Method
Results in µg/Liter:											
Analysis Date	11/18/99			11/18/99			11/18/99				
TPH-Diesel	**2,000** x	1.0	50	**ND**	1.0	50	**ND**	1.0	50	50	8015M
Analysis Date	11/17/99			11/16/99			11/16/99				
TPH-Gas	**4,200**	5.0	250	**ND**	1.0	50	**ND**	1.0	50	50	8015M
MTBE	**33**	5.0	25	**ND**	1.0	5.0	**ND**	1.0	5.0	5.0	8020
Benzene	**63**	5.0	2.5	**ND**	1.0	0.50	**ND**	1.0	0.50	0.50	8020
Toluene	**25**	5.0	2.5	**ND**	1.0	0.50	**ND**	1.0	0.50	0.50	8020
Ethyl Benzene	**65**	5.0	2.5	**ND**	1.0	0.50	**ND**	1.0	0.50	0.50	8020
Xylenes (total)	**590**	5.0	2.5	**ND**	1.0	0.50	**ND**	1.0	0.50	0.50	8020

DF=Dilution Factor ND= None Detected above DLR PQL=Practical Quantitation Limit DLR=Detection Reporting Limit

Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)

Michelle L. Anderson, Lab Director

Entech Analytical Labs, Inc.

CA ELAP# I-2346

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STANDARD LAB QUALIFIERS
July, 1998

All Entech lab reports now reference standard lab qualifiers. These qualifiers are noted in the adjacent column to the analytical result and are adapted from the U.S. EPA CLP program. The current qualifier list is as follows:

Qualifier	Description
U	Compound was analyzed for but not detected
J	Estimated valued for tentatively identified compounds or if result is below PQL but above MDL
N	Presumptive evidence of a compound (for Tentatively Identified Compounds)
B	Analyte is found in the associated Method Blank
E	Compounds whose concentrations exceed the upper level of the calibration range
D	Multiple dilutions reported for analysis: discrepancies between analytes may be due to dilution
X	Results within quantitation range; chromatographic pattern not typical of fuel

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography
Laboratory Control Sample

QC Batch #: GBG1991116
Matrix: Liquid
Units: µg/Liter

Date Analyzed: 11/16/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/Liter	SA µg/Liter	SR µg/Liter	SP µg/Liter	**SP % R**	SPD µg/Liter	**SPD %R**	RPD	QC LIMITS RPD	QC LIMITS %R
Benzene	8020	<0.50	6.6	ND	7.2	**108**	7.2	**109**	0.4	25	77-129
Toluene	8020	<0.50	29.0	ND	27	**94**	28	**95**	1.0	25	82-122
Ethyl Benzene	8020	<0.50	5.7	ND	5.4	**95**	5.4	**95**	0.0	25	77-114
Xylenes	8020	<0.50	30.6	ND	30	**99**	30	**100**	0.7	25	85-125
Gasoline	8015	<50.0	500	ND	439	**88**	436	**87**	0.8	25	75-125
aaa-TFT(S.S.)-PID	8020			100%	103%		103%				65-135
aaa-TFT(S.S.)-FID	8015			87%	95%		95%				65-135

Definition of Terms:

na: Not Analyzed in QC batch
MB: Method Blank
SA: Spike Added
SR: Sample Result
RPD(%): Duplicate Analysis - Relative Percent Difference
SP: Spike Result
SP (%R): Spike % Recovery
SPD: Spike Duplicate Result
SPD (%R): Spike % Recovery
nc: Not Calculated

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography
Laboratory Control Sample

QC Batch #: GBG4991117
Matrix: Liquid
Units: µg/Liter

Date Analyzed: 11/17/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/Liter	SA µg/Liter	SR µg/Liter	SP µg/Liter	**SP % R**	SPD µg/Liter	**SPD %R**	% RPD	QC LIMITS RPD	QC LIMITS %R
Benzene	8020	<0.50	5.6	ND	5.2	**93**	5.1	**90**	3.1	25	70-130
Toluene	8020	<0.50	31	ND	30	**95**	30	**95**	0.3	25	70-130
Ethyl Benzene	8020	<0.50	6.1	ND	5.6	**92**	5.6	**91**	0.6	25	70-130
Xylenes	8020	<0.50	35	ND	33	**95**	33	**94**	0.8	25	70-130
Gasoline	8015	<50.0	500	ND	450	**90**	446	**89**	1.0	25	70-130
aaa-TFT(S.S.)-FID	8020			104%	100%		100%				65-135
aaa-TFT(S.S.)-PID	8015			108%	102%		102%				65-135

Definition of Terms:

na: Not Analyzed in QC batch
MB: Method Blank
SA: Spike Added
SR: Sample Result
RPD(%): Duplicate Analysis - Relative Percent Difference
SP: Spike Result
SP (%R): Spike % Recovery
SPD: Spike Duplicate Result
SPD (%R): Spike % Recovery
nc: Not Calculated

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography
Laboratory Control Spikes

QC Batch #: DW991106
Matrix: Liquid
Units: µg/L

Date analyzed: 11/17/99
Date extracted: 11/15/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/L	SA µg/L	SR µg/L	SP µg/L	**SP %R**	SPD µg/L	**SPD %R**	RPD	QC LIMITS RPD	QC LIMITS %R
Diesel	8015M	<50.0	1000	ND	831	**83**	830	**83**	0.1	25	62-119
Hexocosane(S.S.)				128%	129%		129%				65-135

Definition of Terms:
- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SP (%R) Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R) Spike Duplicate % Recovery
- NC: Not Calculated

BLAINE
TECH SERVICES INC.
1680 ROGERS AVENUE
SAN JOSE, CALIFORNIA 95112-1105
FAX (408) 573-7771
PHONE (408) 573-0555

CHAIN OF COSTODY BTS # 991115-I3

CLIENT Baymyer Eng. Inc.

SITE Kawahara Nursery
16550 Ashland Ave
San Lorenzo, CA

CONDUCT ANALYSIS TO DETECT

LAB Entech DHS #

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND

☐ EPA ☐ RWQCB REGION
☐ LIA
☐ OTHER

SPECIAL INSTRUCTIONS
Invoice & Report to Baymyer Eng.
Attn: Mark Detterman
BEI: Project N. 94015
(*) Short Hold Times

SAMPLE I.D.			MATRIX S = SOIL W = H2O	CONTAINERS TOTAL	C = COMPOSITE ALL CONTAINERS	(8015) (8020) (8020) TPH-G/BTEX/MTBE	TPH-D (8015M)	ALKALINITY (310.1)	* NITRATE/NITRITE (353.3)	SULFATE (375.4)	CARBON DIOXIDE (SM 4500)	* DISS FERROUS IRON	ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
MW-3	11-15-99	1210	W	9		X	X	X	X	X	X	X				17586-001
MW-4	↓	1237	↓	↓		X	X	X	X	X	X	X				-002
MW-5	↓	1325	↓	↓		X	X	X	X	X	X	X				-003

SAMPLING COMPLETED DATE 11-15-99 TIME 1325
SAMPLING PERFORMED BY Patrick Flaherty

RESULTS NEEDED NO LATER THAN Per Client

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Peter [illegible]			David Han	11/15/99	15:27

SHIPPED VIA	DATE SENT	TIME SENT	COOLER #