RO-193

Technology, Engineering & Construction, Inc.

35 South Linden Ave. • So. San Francisco, CA 94080-6407 • Contractor's Lic. #762034

Tel: (650) 952-5551 • Fax: (650) 952-7631 • www.tecaccutite.com

2/19/03

FEB 22 2002

February 15, 2002

Ms. Eva Chu
Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Subject: **Quarterly Monitoring Report for December 2001**
Tier 2 RBCA Report

Site: **Former Olympian Gasoline Station**
1435 Webster Street
Alameda, California

Dear Ms. Chu:

TEC Accutite is pleased to submit this quarterly monitoring report and Tier 2 Risk Assessment for the above referenced site. On December 26, 2001, TEC Accutite sampled six monitoring wells (MW-1 through MW-6). The results of this quarterly monitoring episode and the Tier 2 Risk Assessment are presented in the following report.

Thank you for your cooperation. If you have any questions, please call me at (650) 952-5551, Ext. 208.

Sincerely,
TEC Accutite

David Gregory, R.G.
Project Manager

cc: Mr. Dan Koch, Olympian, 260 Michelle Court, South San Francisco, CA 94080
Mr. David Harris, Esq., Trump, Alioto, Trump & Prescott, LLP, 2280 Union Street, San Francisco, CA 94123
Mr. Jeff Farrar, P.O. Box 1701, Chico, CA 95927
Mr. Thomas Ballard, GHH Engineering, Inc., 8084 Old Auburn Road, Citrus Height, CA 95610

FEB 22 2002

FOURTH QUARTER
GROUNDWATER MONITORING REPORT AND
TIER 2 RISK ASSESSMENT REPORT
DECEMBER 2001

FORMER OLYMPIAN SERVICE STATION
1435 WEBSTER STREET
ALAMEDA, CA

PREPARED FOR:
OLYMPIAN
260 MICHELLE COURT
SOUTH SAN FRANCISCO, CA

PREPARED BY:
TEC ACCUTITE
35 SOUTH LINDEN AVENUE
SOUTH SAN FRANCISCO, CA 94080

SAMPLING DATE
DECEMBER 26, 2001

TEC ACCUTITE

TABLE OF CONTENTS

1.0 INTRODUCTION

On behalf of Olympian, TEC Accutite was contracted to sample six monitoring wells at the former Olympian Station, located at 1435 Webster Street, Alameda, California (Figure 1). This report summarizes the fourth quarter 2001 groundwater monitoring event. In addition, the Alameda County Health Care Services Agnecy (ACHCSA) requested a Tier 2 site specific risk assessment of the potential for hydrocarbons volatilizing from impacted groundwater and impacting indoor and outdoor air. The assessment was considered for a residential and commercial scenario.

2.0 BACKGROUND

The site is located on the corner of Webster Street and Taylor Avenue in Alameda, CA. Prior to 1989, the site was occupied by an Olympian Service Station. Station facilities consisted of two 10,000-gallon gasoline and one 7,500-gallon diesel underground storage tanks (USTs), two dispenser islands and a 500-gallon waste oil UST (Figure 2).

The surrounding topography is flat and the site is approximately 20 feet above mean sea level. The site is situated in a mixed commercial and residential area and is currently leased by the City of Alameda and operated as a metered parking lot.

In October 1988, CHIPS Environmental Consultants, Inc. performed soil gas analysis at the subject site. High soil gas readings were found on the eastern side of one of the pump islands, between the pump islands, and from backfill between the gasoline storage tanks.

In September 1989, TEC Accutite removed the following USTs:

- Two 10,000-gallon gasoline USTs
- One 7,500-gallon diesel UST
- One 500-gallon waste oil UST

Analysis of soil samples collected during removal of the USTs detected hydrocarbons at a maximum concentration of 220 parts per million (ppm) Total Petroleum Hydrocarbons as gasoline (TPHg), 430 ppm Total Petroleum Hydrocarbons as diesel (TPHd), and 650 ppm Total Recoverable Petroleum Hydrocarbons as Oil and Grease (TRPH).

In January 1991, remedial excavation of the hydrocarbon impacted soil was conducted by AAA Tank Removal / Forcade Excavations Services. Approximately 950 cubic yards of soil were removed from the former location of the USTs. This soil was bioremediated onsite and returned to the former excavation.

In January 1993, Uriah Environmental Services, Inc. installed three monitoring wells onsite (MW-1 through MW-3). Soil samples collected during the well installation contained no detectable concentrations of petroleum hydrocarbons. Bi-annual groundwater monitoring was initiated. Dissolved phase hydrocarbons have been detected in all wells at varying concentrations.

In February 1999, TEC Accutite advanced four borings on and offsite (B1 through B4) to determine the extent of hydrocarbon impact to soil and groundwater. The soil analytical results detected non-significant concentrations of TPHg, benzene, toluene, ethyl-benzene, xylenes (BTEX), and methyl tert-butyl ether (MTBE). The groundwater samples detected hydrocarbon concentrations up to 6,000 parts per billion (ppb) MTBE and 38,000 ppb benzene.

In December 1999, TEC Accutite installed three additional wells MW-4 through MW-6 to define the dissolved phase hydrocarbons and assess plume stability. Analysis of soil samples detected hydrocarbon concentrations of 1,100 ppm TPHg, 200 ppm TPHd and 3.4 ppm benzene from soil collected at 9.5 feet below grade (fbg) in well MW-5. No hydrocarbons were detected in the soil samples collected during the installation of wells MW-4 and MW-6. Groundwater sampling from wells MW-6 and MW-3 defined the dissolved phase hydrocarbon plume upgradient of the former dispenser islands and cross-gradient of the former USTs.

In November 2000, TEC Accutite completed a site conceptual model. Based on historical quarterly monitoring data, it was determined that the contaminant plume is unstable and is undefined downgradient. An assessment of hydrological conditions, proximity to sensitive receptors and current groundwater usage, suggest that MTBE in groundwater is not the primary chemical of concern. Given the shallow groundwater elevation (9 fbg), estimated high permeability of soils beneath the site, the potential for benzene vapor phase migration from hydrocarbon affected groundwater to indoor and ambient air was identified as an exposure pathway requiring future evaluation.

In June 2001, TEC Accutite drilled additional four borings to assess the extent of the plume and sampled all wells. Soil samples were collected approximately 9 fbg within the capillary fringe from soil borings B1 through B4. No petroleum hydrocarbons were detected in the soil above laboratory reporting limits. The greatest concentration of dissolved phase petroleum hydrocarbons were detected in monitoring well MW-1 at 18,000 ppb TPHg, 1,200 ppb benzene, and 1,500 ppb MTBE. Dissolved phase concentrations of TPHg, benzene, and MTBE in surrounding monitoring wells were either non-detect or insignificant.

As a part of an ongoing site assessment, this report details the fourth quarter groundwater sampling episode for 2001. In addition, a Tier 2 site specific risk assessment was performed to evaluate if the migration of the vapor phase hydrocarbons from impacted groundwater beneath the site presents a inhalation risk to indoor and outdoor air.

3.0 QUARTERLY GROUNDWATER SAMPLING

On December 26, 2001, TEC Accutite sampled all six monitoring wells MW-1 through MW-6. All wells were purged prior to sampling. The groundwater samples were collected with disposable bailers and transferred into sampling vials and containers. The samples were transported in a cooler at approximately 4°C. A completed chain of custody accompanied the samples to North State Environmental Laboratory. All groundwater samples were analyzed for TPHg (USEPA Method 8015), BTEX, MTBE (USEPA Method 8020). Significant MTBE detections were confirmed by USEPA Method 8260. Well sampling logs are presented in Attachment A.

Electronic Laboratory Data Submittal

The laboratory report was converted into EDF 1.2i format and was uploaded to the web-based Geo-spatial database (GeoTracker). Prior to sending the EDF file to the website, an EDCC (Electronic Deliverable Consistency Checker) was run on the files. The EDCC ensured the format compliance and checks for format errors, logic errors and content errors. The hard copy of the laboratory report is presented in Attachment B. Attachment C contains the hard copy generated from the EDCC and the upload confirmation number.

4.0 QUARTERLY MONITORING RESULTS

Groundwater Elevation and Flow Direction

On December 26, 2001, TEC Accutite measured the groundwater elevations in all six wells prior to sampling. The reference mark considered as a base for calculating the groundwater elevations was a fire hydrant, located on the sidewalk of Webster Street.

The calculated groundwater flow direction was to the southeast at a gradient of 0.007 (Figure 2). Groundwater elevation data are summarized below.

Groundwater Elevation Data

Well Identification	Elevation of Casing in ft	Depth to Ground-Water in ft	Ground Water Elevation in ft
MW-1	19.53	8.11	11.42
MW-2	19.80	8.28	11.52
MW-3	19.79	8.01	11.78
MW-4	19.30	8.18	11.12
MW-5	18.99	7.28	11.71
MW-6	20.27	8.4	11.87

Hydrocarbons in Groundwater

Dissolved phase hydrocarbons were detected at maximum concentrations of 3240 ppb TPHg, 738 ppb benzene in well MW-5 (Figure 3). Concentrations of TPHg, benzene and MTBE significantly decreased in well MW-1 from 48,000 ppb TPHg, 5,200 ppb benzene and 4000 ppb MTBE in September 2001, to 524 ppb TPHg, 216 ppb benzene and 721 ppb MTBE in December 2001 (Table 1). Non-significant concentrations were detected in other wells.

5.0 TIER 2 RISK ASSESSMENT

A site-specific risk assessment was carried out to assess the health risk posed by high concentrations of TPHg and benzene in groundwater beneath the site. At the request of the ACHCSA the risk assessment was prepared assuming residential and commercial scenarios. The site-specific risk assessment evaluates the identified exposure pathways, considering the insitu properties at the site. The exposure pathway evaluated was the potential impact to indoor and outdoor air from volatilization of TPH & benzene from groundwater beneath the site; refer to Exposure Pathway Flowchart in Attachment D.

The risk assessment was performed according to the ASTM PS-104, using the commercial software "RBCA Tool Kit for Chemical Release, Version 1.0a, Groundwater Services, Inc. (GSI)". The RBCA Tool Kit for Chemical Releases is designed to complete all calculations required for Tiers 1 and 2 of the RBCA planning process, as defined in ASTM PS-104 Standard Provisional Guide for Risk-Based Corrective Action (1998). The detailed calculations are attached in Attachment D.

Annual Regional Mean Concentration

To determine representative concentrations of dissolved phase benzene and TPH, the annual regional mean concentrations were calculated. To calculate the annual mean concentrations of benzene and TPH the following approach was adopted:

- Monitoring wells with non-detect concentrations were not used in calculation;
- The annual regional mean was calculated using the regional mean for each quarter;
- The annual regional mean was calculated for 95% Upper Confidence Level (UCL);
- For TPHg, TPH fractional methodology developed by TPHCWG (TPH Criteria Working Group) was used. This approach splits the TPH into a small number of groups that have similar properties. The estimated risk is then evaluated for the groups and the most conservative concentration is considered as the Site Specific Target Level (SSTL) for TPH. For details refer to Attachment D.

The calculated annual regional mean concentrations for benzene and TPHg are 2,988 ppb and 23,137 ppb, respectively.

RBCA Input Parameters

The RBCA model is sensitive to site-specific parameters, constituent of concern (CoC) physiochemical parameters and physical assumptions. The detailed input and physiochemical parameter are presented in Attachment D. However, few important parameters/assumptions which could help the reader to weigh the risk assessment are pointed out below:

- ASTM standard soil physical values were used for Sand (SP). The subsurface investigation classified soil at the site as SP (Sand). No insitu soil properties are available.
- A groundwater depth of 9-fbg was used.
- Johnson & Ettinger Vapor Transport Model was used.
- For indoor air concentrations, a slab thickness of 6" and capillary zone thickness of 2" was considered.
- No pressure difference between soil and indoor air was considered.
- Building height was assumed to be 7.5 ft for residential and 10 ft for commercial.
- Air mixing zone of 2 m i.e. 6.56 ft was assumed for ambient air.
- Building air exchange rate of 2 h^{-1} for residential and 5 h^{-1} for commercial as per CRWQCB Oakland, 2000.
- Oral Unit Factor of 0.1 was used, as per Cal-EPA.
- Inhalation Unit Risk Factor of 2.86E-05 $\mu g/m^3$ was used, as per CRWQCB Oakland, 2000.
- All the TPH properties were used from TPH Criteria Working Group (TPHCWG) publications.
- Foundation crack fraction of 0.001 was used.

6.0 TIER 2 RISK ASSESSMENT RESULTS

The calculated concentrations of benzene and TPH in groundwater considered to be safe for the targeted exposure pathway, assuming a residential and commercial scenario, are presented below. Concentrations below the SSTLs are believed not to effect human health due to indoor and outdoor air inhalation. TPH concentrations in groundwater beneath the site do not exceed the residential or commercial SSTL's and therefore pose no risk to indoor or outdoor air. Benzene concentrations in groundwater exceed the SSTL for a residential scenario (110 ppb) but are less than the SSTL for a commercial scenario (6400 ppb).

Site Specific Target Levels – Residential Scenario

Name	Site Concentration	On-site Indoor Air Volatilization	On-site Out door Volatilization	Applicable SSTL	SSTL Exceeded	Rqd CRF
	(ppm)	Residential (ppm)	Residential (ppm)	(ppm)		
Benzene*	3.0E+0	1.1E-1	2.3E+0	1.1E-1	Yes	2.6E+1
TPH - Aliphatic >C05-C06	3.9E+0	>3.6E+1	>3.6E+1	>3.6E+1	No	NA
TPH - Aliphatic >C06-C08	3.9E+0	>5.4E+0	>5.4E+0	>5.4E+0	No	NA
TPH - Aliphatic >C08-C10	3.9E+0	>4.3E-1	>4.3E-1	>4.3E-1	No	NA
TPH - Aliphatic >C10-C12	3.9E+0	>3.4E-2	>3.4E-2	>3.4E-2	No	NA
TPH - Aromatic >C05-C07	2.6E+0	7.2E+0	1.5E+2	7.2E+0	No	<1
TPH - Aromatic >C07-C08	2.6E+0	4.1E+2	>5.2E+2	4.1E+1	No	<1
TPH - Aromatic >C08-C10	2.6E+0	>6.5E+1	>6.5E+1	>6.5E+1	No	NA

Site Specific Target Levels – Commercial Scenario

Name	Site Concentration	On-site Indoor Air Volatilization	On-site Out door Volatilization	Applicable SSTL	SSTL Exceeded	Rqd CRF
	(ppm)	Commercial (ppm)	Commercial (ppm)	(ppm)		
Benzene*	3.0E+0	6.4E+0	8.0E+0	6.4E+0	No	<1
TPH - Aliphatic >C05-C06	3.9E+0	>3.6E+1	>3.6E+1	>3.6E+1	No	NA
TPH - Aliphatic >C06-C08	3.9E+0	>5.4E+0	>5.4E+0	>5.4E+0	No	NA
TPH - Aliphatic >C08-C10	3.9E+0	>4.3E-1	>4.3E-1	>4.3E-1	No	NA
TPH - Aliphatic >C10-C12	3.9E+0	>3.4E-2	>3.4E-2	>3.4E-2	No	NA
TPH - Aromatic >C05-C07	2.6E+0	3.4E+1	4.4E+2	3.4E+1	No	<1
TPH - Aromatic >C07-C08	2.6E+0	>5.2E+2	>5.2E+2	>5.2E+2	No	NA
TPH - Aromatic >C08-C10	2.6E+0	>6.5E+1	>6.5E+1	6.5E+1	No	NA

">" indicates risk-based target concentration greater than constituent solubility value.
"NA" Not Applicable.
"NC" Not Calculated.
"CFR" Concentration Reduction Factor.

7.0 CONCLUSIONS

- The calculated groundwater flow direction is toward the southeast at a gradient of 0.007. This is consistent with previous sampling events.

- Hydrocarbons in groundwater remain elevated in the vicinity of wells MW-1 and MW-5. The greatest concentrations of dissolved phase hydrocarbons were detected in well MW-5 at 3,240 ppb TPHg, 738 ppb benzene, and 66 ppb MTBE. Non significant hydrocarbon concentrations were detected in the peripheral wells MW-2, MW-3, MW-4 and MW-6.

- A Tier 2 Site Specific Risk Assessment indicates that TPH concentrations in groundwater are below the calculated SSTL's for residential and commercial scenarios. Therefore, TPH concentrations remaining in groundwater beneath the site are believed to pose no risk to human health due to indoor or outdoor air inhalation.

- Benzene concentrations in groundwater beneath the site exceed the Tier 2 SSTL's for a residential scenario but fall below the SSTL's for a commercial scenario.

8.0 RECOMMENDATIONS

In November 2000, TEC Accutite prepared a Site Conceptual Model to identify potential sensitive receptors and exposure pathways for site hydrocarbons. Based on site characteristics, it was determined that there was a potential for impact to indoor and outdoor air by volatilization of hydrocarbons from groundwater beneath the site. The AMCHSA concurred with the conclusions, recommending further evaluation of the exposure pathway. TEC Accuite conducted a TIER 2 RBCA of the site and determined that hydrocarbons in groundwater pose no risk to indoor or outdoor air providing the site is restricted to commercial landuse. Therefore, at the request of the responsible parties (Olympian & Mr. Farrar), TEC Accutite wishes to proceed with case closure by applying a deed restriction on commercial landuse only.

9.0 LIMITATIONS

Our services consist of professional opinions, conclusions, and recommendations made today in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied.

Thank you for your cooperation. If you have any questions, please contact the undersigned at (650) 952-5551, Ext. 205.

Sincerely,
TEC Accutite

David Gregory, R.G
Project Manager

Reviewed by:

Sami Malaeb, P.E., R.E.A.
Environmental Director

REGISTERED PROFESSIONAL ENGINEER
SAMI M. MALAEB
No. 60888
Exp. 12/31/04
CIVIL
STATE OF CALIFORNIA

cc: Mr. Rusty Firenze, Olympian, 260 Michelle Court, South San Francisco, CA 94080
Mr. David Harris, Esq., Trump, Alioto, Trump & Prescott, LLP, 2280 Union Street, San Francisco, CA 94123
Mr. Jeff Farrar, P.O. Box 1701, Chico, CA 95927
Mr. Thomas Ballard, GHH Engineering, Inc., 8084 Old Auburn Road, Citrus Height, CA 95610

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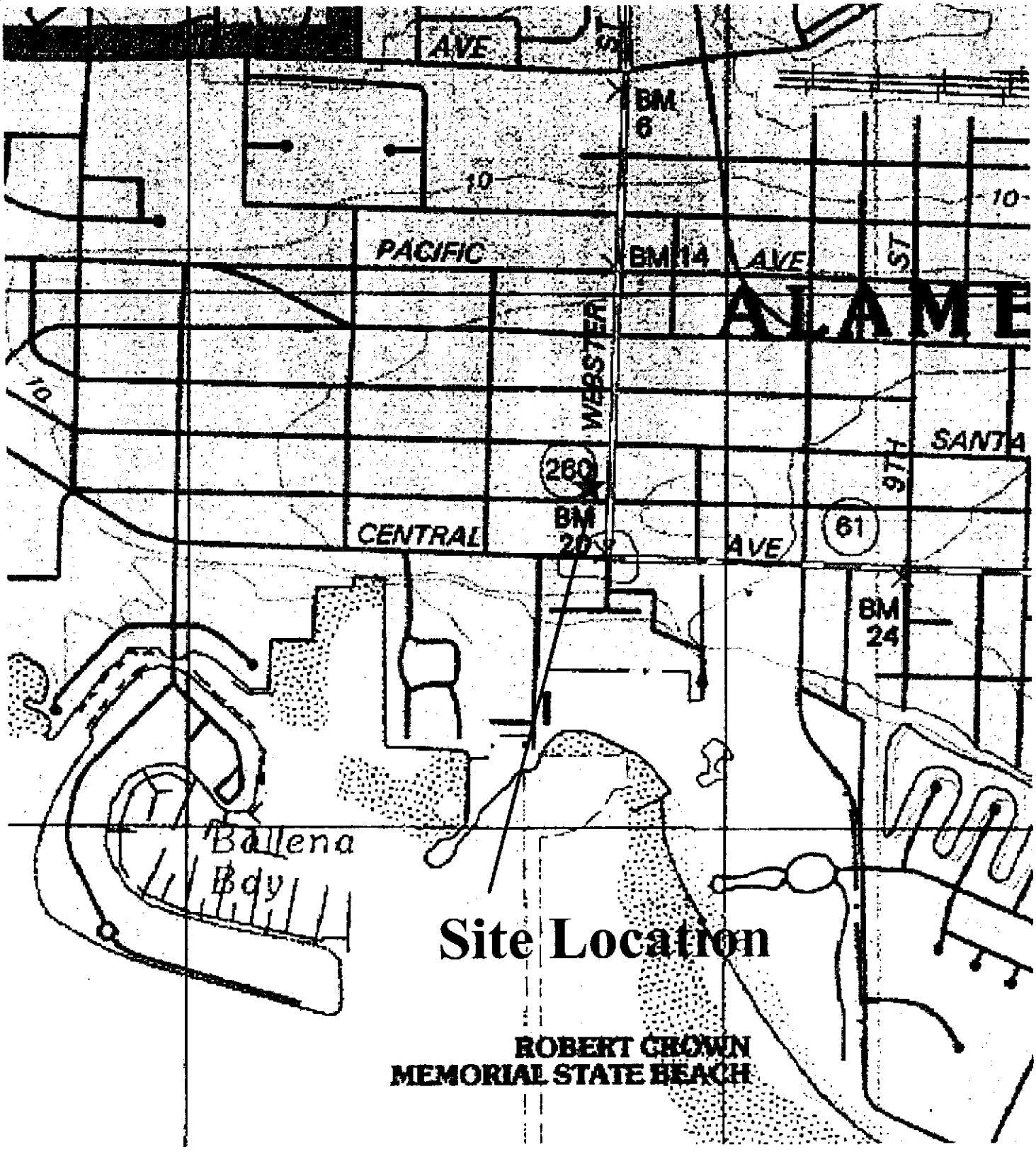
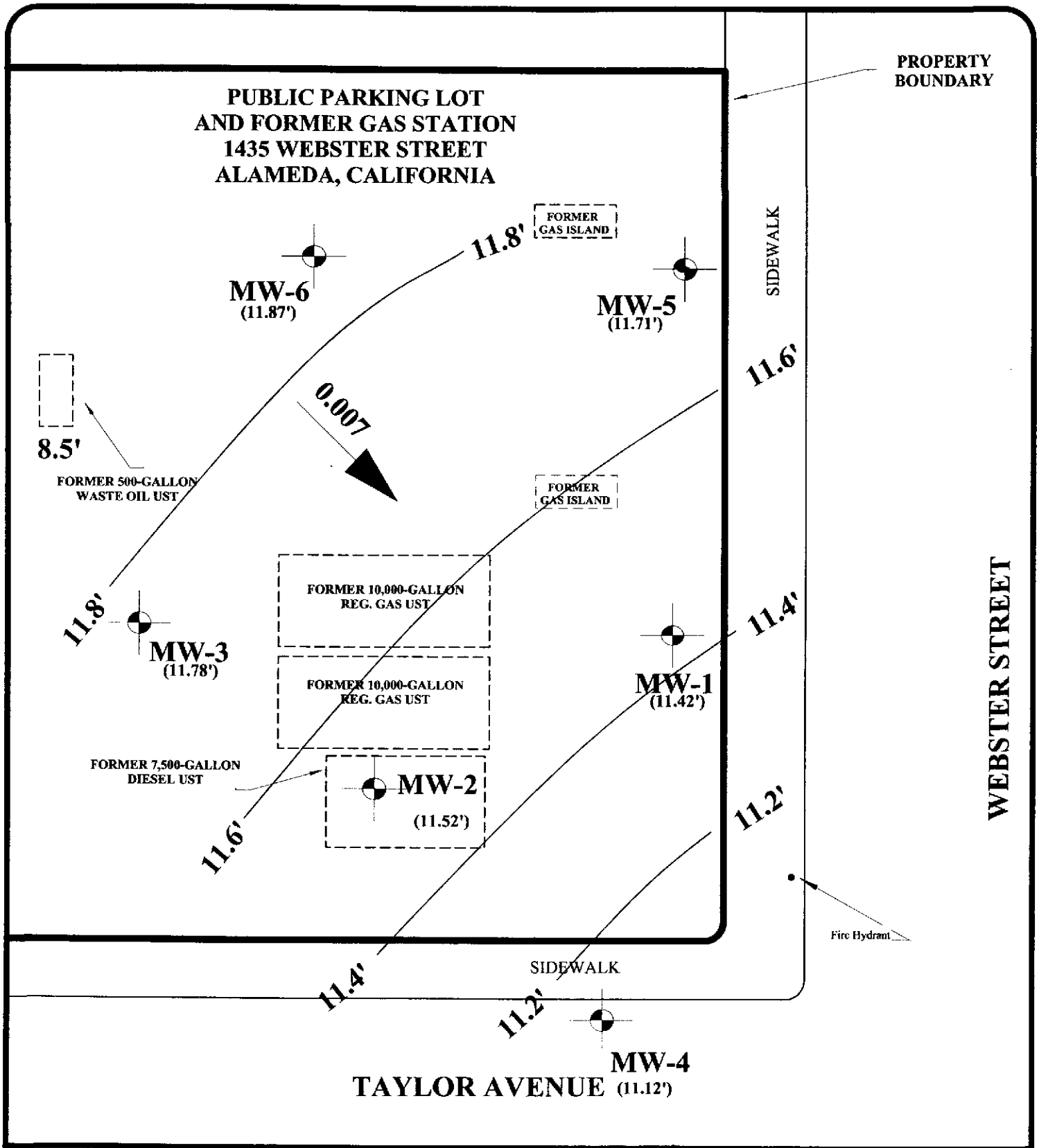


	DATE 11/15/00	PAGE 1 of 1		FIGURE 1
N	NO SCALE			SITE VICINITY MAP
	LEGEND:		35 SOUTH LINDEN AVENUE SOUTH SAN FRANCISCO	SITE: 1435 WEBSTER STREET ALAMEDA, CA

Vicinitymap TCW



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SCALE
0 10 20
FEET

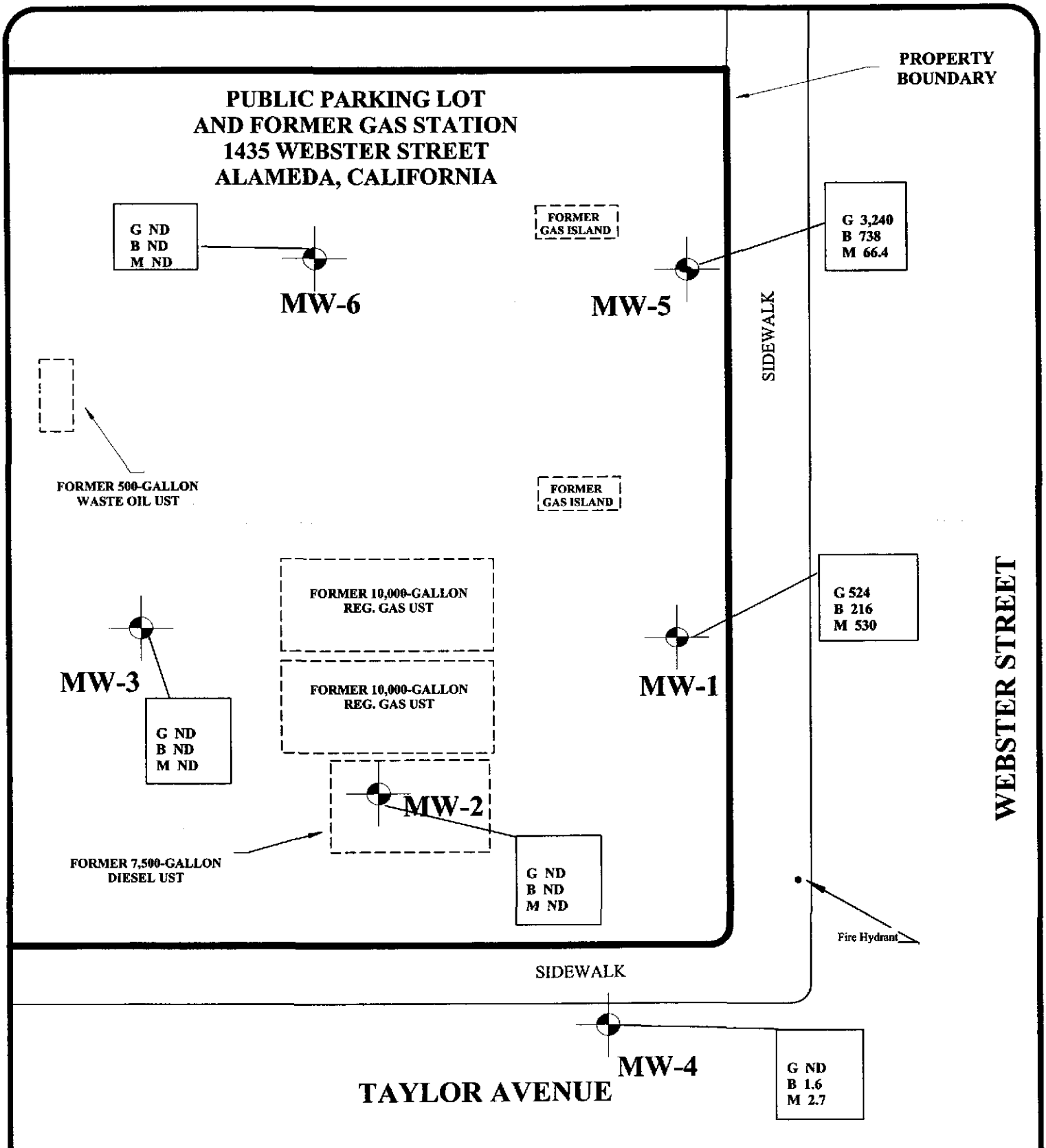
TEG ACCUTITE

35 SOUTH LINDEN AVENUE
SOUTH SAN FRANCISCO

1435GWFsept2001

FIGURE 2
GROUNDWATER FLOW DIRECTION AND GRADIENT, DECEMBER 2001
1435 WEBSTER STREET
ALAMEDA, CALIFORNIA

KEY:
- MONITORING WELL AND GROUNDWATER ELEVATION (MSL) (11.12')
- 0.007 GROUNDWATER FLOW DIRECTION AND GRADIENT



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ACCUTITE

35 SOUTH LINDEN AVENUE
SOUTH SAN FRANCISCO

GWHCDec2001.TCW

FIGURE 3:

HYDROCARBON CONCENTRATIONS IN GROUNDWATER
DECEMBER 2001

1435 WEBSTER STREET
ALAMEDA, CALIFORNIA

KEY:

G = TPHG
B = BENZENE
M = MTBE
CONCENTRATIONS IN PPB

MONITORING WELLS

TABLE 1: Historical Groundwater Analytical Data - Former Olympian Station, 1435 Webster Street, Alameda CA.

Well ID	Sample Date	Depth to Water (ft)	TPHd	TPHg	B	T	E	X	MTBE	TRPH
					Concentrations in parts per billion (ppb)					
MW-1	6/3/93	NA(1)	NA	NA	NA	NA	NA	NA	NA	NA
	9/14/94	11.46	<50	14,000	44	28	25	50	NA	800
	12/30/94	9.22	<50	4,000	12	9	6.8	30	NA	<500
	3/26/95	6.76	<50	1,000	21	10	7.1	25	NA	2,100
	7/9/95	8.92	<50	16,000	57	28	25	53	NA	NA
	7/31/98	8.3	1,700	4,700	1,300	48	140	150	6,600	<5000
	2/11/99	7.91	2000	25,000	18,000	1,600	1,400	500	28,000	NA
	6/23/99	9.03	4,900	42,000	11,000	1,100	1,500	2,300	15,000	NA
	12/6/99	10.86	4,000	44,000	8,900	3,400	1,900	5,100	11,000	NA
	3/16/00	6.93	700	5,100	2,400	100	280	460	2,700(2)	NA
	6/13/00	8.73	2,800	17,000	5,300	260	720	790	7,000(2)	NA
	9/29/00	10.18	5,200*	50,000	11,000	2,900	1,900	4,600	7,200(2)	NA
	3/22/01	8.24	1,500*	8,600	2,600	750	250	950	3,200(2)	NA
	6/25/01	9.73	NA	18,000	1,200	1,800	970	3,200	1500(2)	NA
	9/28/01	11.06	NA	48,000	5,200	6100	2200	8100	4000	NA
	12/26/2001	8.11	NA	524	216	1.2	8.6	7.4	530(2)	NA
MW-2	6/3/93	9.54	<50	<50	5.8	<0.5	<0.5	<0.5	NA	<500
	9/14/94	11.82	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<500
	12/30/94	9.46	<50	160	1.4	1.4	0.8	5	NA	<500
	3/26/95	6.82	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<500
	7/9/95	9.22	NA	NA	NA	NA	NA	NA	NA	NA
	7/31/98	8.56	220	<50	<0.5	<0.5	<0.5	<0.5	73	<500
	2/11/99	8.12	<50	<50	<0.5	<0.5	<0.5	<0.5	75	NA
	6/23/99	9.33	420	<50	<0.5	<0.5	<0.5	<0.5	96	NA
	12/6/99	11.2	<110	300	28	45	6	37	210	NA
	3/16/00	6.88	<50	<50	1	<0.5	0.5	1	3	NA
	6/13/00	8.99	<50	68	0.8	<0.5	<0.5	<0.5	38	NA
	9/29/00	10.4	<50	67	0.8	0.5	<0.5	1	86(2)	NA
	3/22/01	8.46	<50	<50	1	0.5	<0.5	1	14	NA
	6/25/01	10.11	NA	<50	<0.5	<0.5	<0.5	<1.0	13	NA
	9/28/01	11.4	NA	300	4	6	3	10	130	NA
	12/26/01	8.26	NA	<50	<0.5	<0.5	<0.5	<1.0	<0.5	ND
MW-3	6/3/93	9.8	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<500
	9/14/94	12.19	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<500
	12/30/94	9.72	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<500
	3/26/95	6.88	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<500
	7/9/95	9.52	NA	NA	NA	NA	NA	NA	NA	NA
	7/31/98	8.4	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5000
	2/11/99	7.77	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA
	6/23/99	9.21	<50	<50	<0.5	<0.5	<0.5	<0.5	3	NA
	12/6/99	11.12	<110	<50	3	1	<0.5	1	0.6	NA
	3/16/00	6.48	<50	<50	<0.5	<0.5	<0.5	<1.0	1	NA
	6/13/00	8.76	<50	490	0.8	<0.5	<0.5	9	2	NA
	9/29/00	10.2	<50	57	<0.5	<0.5	<0.5	<1.0	<1.0(2)	NA
	3/22/01	8.24	<50	<50	<0.5	<0.5	<0.5	<1.0	2	NA
	6/25/01	10.04	NA	<50	<0.5	<0.5	<0.5	<1.0	0.8	NA
	9/28/01	11.34	NA	91	<0.5	<0.5	<0.5	2	2	NA
	12/26/01	8.01	NA	<50	<0.5	<0.5	<0.5	<1.0	<0.5	NA
MW-4	12/6/99	10.79	160	<50	3	2	0.6	4	140	NA
	3/16/00	6.86	90	<50	0.5	0.5	<0.5	2	34	NA
	6/13/00	8.18	<50	56	<0.5	<0.5	<0.5	<1.0	1	NA
	9/29/00	10.11	<50	92	0.7	<0.5	<0.5	3	<1.0(2)	NA
	4/5/01	8.26	<50	51	<0.5	0.5	<0.5	1	6.0(2)	NA
	6/25/01	9.68	NA	<50	<0.5	<0.5	<0.5	<1.0	<0.5	NA
	9/28/01	10.98	NA	<50	<0.5	<0.5	<0.5	2	2	NA
	12/26/01	8.18	NA	<50	1.6	1.7	1.6	4.4	2.7	NA
MW-5	12/6/99	10.17	2,800	30,000	2,200	3,300	910	7000	670	NA
	3/16/00	6.28	1,100	3,500	1,100	260	210	6300	260	NA
	6/13/00	7.95	1,100	6,500	2200	360	360	730	480	NA
	9/29/00	9.54	700*	3,900	990	120	300	340	390(2)	NA
	3/22/01	7.48	380*	4,300	780	240	250	530	190	NA
	6/25/01	9.05	NA	3,100	1000	110	200	320	140	NA
	9/28/01	10.39	NA	3,000	1200	77	120	170	770	NA
	12/26/01	7.28	NA	3,240	738	262	218	626	664	NA

TABLE 1: Continued

Well ID	Sample Date	Depth to Water (ft)	TPHd	TPHg	B	T	E	X	MTBE	TRPH
					Concentrations in parts per billion (ppb)					
MW-6	12/6/99	11.46	110	<50	2	2	0.8	8	1	NA
	3/16/00	8.32	<50	<50	8	8	5	18	<0.5	NA
	6/13/00	9.14	<50	75	0.7	1	0.9	2	0.6	NA
	9/29/00	10.81	<50	<50	<0.5	<0.5	<0.5	<1.0	<0.5	NA
	3/22/01	8.64	<50	66	0.5	<0.5	<0.5	<1.0	3	NA
	6/25/01	10.39	NA	<50	<0.5	<0.5	<0.5	<1.0	4	NA
	9/28/01	11.7	NA	63	2	ND	ND	1	3	NA
	12/26/01	8.4	NA	<50	<0.5	<0.5	<0.5	1.4	<0.5	NA

Abbreviations / Notes

TPHd = Total Petroleum Hydrocarbons as Diesel (EPA Method 8015)
TPHg = Total Petroleum Hydrocarbons as Gasoline (EPA Method 8015)
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes (EPA Method 8020)
MTBE = Methyl tert-butyl Ether (EPA Method 8020)
TRPH = Total Recoverable Petroleum Hydrocarbons
<X = Concentration less than laboratory reporting limit
NA = not analyzed
* Does not match diesel chromalogram pattern
(2) Confirmed by EPA Method 8260

ATTACHMENT A

MONITORING WELL SAMPLING LOGS

CLIENT: OLYMPIAN
ADDRESS: 1435 WEBSTER ST ALAMEDA, CA
WELL # TESTED: MW1

To convert water column height to total amount of gallons in one (1) well volume, multiply the water colum height by A.

WELL DIAMETER	A
(2")	0.17
3"	0.36
4"	0.65

TOTAL WELL DEPTH ~~20~~ 22.68
- DEPTH TO WATER 8.11
= WATER COLUM HEIGHT 14.57 x A = 2.48 GAL (1 well volume)

Multiply one (1) well volume by three (3) to obtain the minimum # of gallons to be extracted before taking well sample(s).

3 x 2.48 = 7.44 (3 well volume)

DATE: [illegible]
TIME: [illegible]
WATER LEVEL: 8.09

TIME:	GALS PUMPED	TEMP	COND.	PH
1[illegible]5	2.48	18.8	1795	6.14
1[illegible]7	4.96	19.2	1805	6.16
1[illegible]9	7.44	19.6	[illegible]	[illegible]

Time:
Volume Pumped:
Sampler:

Sheen or inches of free product:
Analyzed for:

CLIENT: OLYMPIAN
ADDRESS: 1435 WEBSTER ST ALAMEDA, CA.
WELL # TESTED: MW2

To convert water column height to total amount of gallons in one (1) well volume, multiply the water colum height by A.

WELL DIAMETER	A
(2")	0.17
3"	0.36
4"	0.65

TOTAL WELL DEPTH ~~20~~ 19.14
- DEPTH TO WATER 8.26
= WATER COLUM HEIGHT 10.88 x A = 1.85 GAL (1 well volume)

Multiply one (1) well volume by three (3) to obtain the minimum # of gallons to be extracted before taking well sample(s).

3 x 1.85 = 5.55 (3 well volume)

DATE: 2/24/21
TIME: 2:17
WATER LEVEL: 8.27

TIME:	GALS PUMPED	TEMP	COND.	PH
12:50	1.85	18.5	290	6.16
12:52	3.70	18.6	290	6.20
12:53	5.55	18.7	288	6.23

Time:
Volume Pumped:
Sampler:

Sheen or inches of free product:
Analyzed for:

CLIENT: OLYMPIAN
ADDRESS: 1435 WEBSTER ST. ALAMEDA, CA
WELL # TESTED: MW3

To convert water column height to total amount of gallons in one (1) well volume, multiply the water colum height by A.

WELL DIAMETER	A
(2")	0.17
3"	0.36
4"	0.65

TOTAL WELL DEPTH 19.7
- DEPTH TO WATER 8.01
= WATER COLUM HEIGHT 11.69 x A = 1.99 GAL (1 well volume)

Multiply one (1) well volume by three (3) to obtain the minimum # of gallons to be extracted before taking well sample(s).

3 x 1.99 = 5.97 (3 well volume)

DATE: 12/24/01
TIME: 2:28
WATER LEVEL: 8.01

TIME:	GALS PUMPED	TEMP	COND.	PH
1:04	1.99	18.8	145.3	6.17
1:05	3.98	18.9	52.3	6.19
1:06	5.97	19.3	38.1	6.22

Time:
Volume Pumped:
Sampler:

Sheen or inches of free product:
Analyzed for:

CLIENT: OLYMPIAN
ADDRESS: 1435 WEBSTER ST. ALAMEDA, CA.
WELL # TESTED: MW4

To convert water column height to total amount of gallons in one (1) well volume, multiply the water colum height by A.

WELL DIAMETER	A
(2")	0.17
3"	0.36
4"	0.65

TOTAL WELL DEPTH ~~20~~ 19.63
- DEPTH TO WATER 8.18
= WATER COLUM HEIGHT 11.45 x A = 1.95 GAL (1 well volume)

Multiply one (1) well volume by three (3) to obtain the minimum # of gallons to be extracted before taking well sample(s).

3 x 1.95 = 5.85 (3 well volume)

DATE: 12/26/01
TIME: 2:03
WATER LEVEL: 8.15

TIME:	GALS PUMPED	TEMP	COND.	PH
12:30	1.95	17.7	162.4	6.20
12:36	3.90	17.3	159.6	6.15
12:40	5.85	18.0	162.0	6.20

Time:
Volume Pumped:
Sampler:

Sheen or inches of free product:
Analyzed for:

CLIENT: OLYMPIAN
ADDRESS: 1435 WEBSTER ST. ALAMEDA, CA
WELL # TESTED: MW6

To convert water column height to total amount of gallons in one (1) well volume, multiply the water colum height by A.

WELL DIAMETER	A
(2")	0.17
3"	0.36
4"	0.65

TOTAL WELL DEPTH ~~19.39~~ 18.79
- DEPTH TO WATER 7.28
= WATER COLUM HEIGHT 11.51 x A = 1.96 GAL (1 well volume)

Multiply one (1) well volume by three (3) to obtain the minimum # of gallons to be extracted before taking well sample(s).

3 x 1.96 = 5.88 (3 well volume)

DATE: 12/20/01
TIME: 1:50
WATER LEVEL: 7.33

TIME:	GALS PUMPED	TEMP	COND.	PH	
11:40	1.96	18.4	281	6.17	*OIL SHEEN ~~*VERY~~
11:55	3.92	18.1	294	6.18	* SLOW RECHARGE
12:15	5.88	17.6	299	6.18	

Time:
Volume Pumped:
Sampler:

Sheen or inches of free product:
Analyzed for:

* OIL SHEEN
~~* VERY WEAK H2S ODOR~~
* SLOW RECHARGE

CLIENT: OLYMPIAN
ADDRESS: 1435 WEBSTER ST. ALAMEDA, CA
WELL # TESTED: MW6

To convert water column height to total amount of gallons in one (1) well volume, multiply the water colum height by A.

WELL DIAMETER	A
(2")	0.17
3"	0.36
4"	0.65

TOTAL WELL DEPTH ~~18.35~~ 19.26
- DEPTH TO WATER 8.40
= WATER COLUM HEIGHT 10.86 x A = 1.85 GAL (1 well volume)

Multiply one (1) well volume by three (3) to obtain the minimum # of gallons to be extracted before taking well sample(s).

3 x 1.85 = 5.55 (3 well volume)

DATE: 12/26/01
TIME: 2:42
WATER LEVEL: 1.38

TIME:	GALS PUMPED	TEMP	COND.	PH
1:16	1.85	19.2	364	6.17
1:17	3.70	19.4	355	6.16
1:19	5.55	20.1	375	6.11

Time:
Volume Pumped:
Sampler:

Sheen or inches of free product:
Analyzed for:

ATTACHMENT B

LABORATORY REPORT

Laboratory Report Project Overview

EDF 1.2a

Laboratory:	North State Environmental, South San Francisco, CA
Lab Report Number:	01-1858
Project Name:	OLYMPIAN/1435 WEBSTER ST.
Work Order Number:	01-1858
Control Sheet Number:	T0600100766

Report Summary

Labreport	Sampid	Labsampid	Mtrx	QC	Anmcode	Exmcode	Logdate	Extdate	Anadate	Lablotctl	Run Sub
01-1858	MW 1	01-1858-01	W	CS	SW8020F	SW5030B	12/26/2001	12/27/2001	12/27/2001	12271MGBXW	1
01-1858	MW 1	01-1858-01	W	CS	SW8260A	SW5030B	12/26/2001	01/02/2002	01/03/2002	12271MGBXW	1
01-1858	MW 2	01-1858-02	W	CS	SW8020F	SW5030B	12/26/2001	12/27/2001	12/27/2001	12271MGBXW	1
01-1858	MW 3	01-1858-03	W	CS	SW8020F	SW5030B	12/26/2001	12/27/2001	12/27/2001	12271MGBXW	1
01-1858	MW 4	01-1858-04	W	CS	SW8020F	SW5030B	12/26/2001	12/27/2001	12/27/2001	12271MGBXW	1
01-1858	MW 5	01-1858-05	W	CS	SW8020F	SW5030B	12/26/2001	12/27/2001	12/27/2001	12271MGBXW	1
01-1858	MW 6	01-1858-06	W	CS	SW8020F	SW5030B	12/26/2001	12/27/2001	12/27/2001	12271MGBXW	1
		BLK	W	LB1	SW8020F	SW5030B	/ /	12/27/2001	12/27/2001	12271MGBXW	1
		01-1858-03MS	W	MS1	SW8020F	SW5030B	/ /	12/27/2001	12/27/2001	12271MGBXW	1
		01-1858-03MS	W	SD1	SW8020F	SW5030B	/ /	12/27/2001	12/27/2001	12271MGBXW	1

Case Narrative

North State Environmental, South San Francisco, CA

Report Date:	01/03/2002	Project:	OLYMPIAN/1435 WEBSTER
Report Number:	01-1858	Order #:	01-1858

Six water samples were received and analyzed for Gasoline, BTEX, MTBE. Sample MW 1 was confirmed for MTBE by GC/MS method 8260.

Approved by: _____ Date: 1/3/02

North State Environmental, South San Francisco, CA

Lab Report No.: 01-1858 Date: 01/03/2002 Page: 1

Project Name:	OLYMPIAN/1435	Analysis:	BTEX/Gasoline Range Organics (SW8020/8015)
Project No:	01-1858	Method:	SW8020F
		Prep Meth:	SW5030B

Field ID:	MW 1	Lab Samp ID:	01-1858-01
Descr/Location:	MW 1	Rec'd Date:	12/26/2001
Sample Date:	12/26/2001	Prep Date:	12/27/2001
Sample Time:	NA	Analysis Date:	12/27/2001
Matrix:	Water	QC Batch:	12271MGBXW
Basis:	Wet	Notes:	

Analyte	Det Limit	Rep Limit		Note	Result	Units	Pvc Dil
Gasoline Range Organics	27.	50.	PQL		524.	UG/L	1
Benzene	0.26	0.5	PQL		216.	UG/L	1
Toluene	0.48	0.5	PQL		1.2	UG/L	1
Ethylbenzene	0.44	0.5	PQL		8.6	UG/L	1
Xylenes	0.51	1.0	PQL		7.4	UG/L	1
Methyl-tert-butyl ether	0.16	0.5	PQL		721.	UG/L	1

Approved by: _____ Date: _____

Lab Report No.: 01-1858 Date: 01/03/2002

Project Name:	OLYMPIAN/1435	Analysis:	BTEX/Gasoline Range Organics (SW8020/8015)
Project No:	01-1858	Method:	SW8020F
		Prep Meth:	SW5030B

Field ID:	MW 2	Lab Samp ID:	01-1858-02
Descr/Location:	MW 2	Rec'd Date:	12/26/2001
Sample Date:	12/26/2001	Prep Date:	12/27/2001
Sample Time:	NA	Analysis Date:	12/27/2001
Matrix:	Water	QC Batch:	12271MGBXW
Basis:	Wet	Notes:	

Analyte	Det Limit	Rep Limit		Note	Result	Units	Pvc Dil
Gasoline Range Organics	27.	50.	PQL		ND	UG/L	1
Benzene	0.26	0.5	PQL		ND	UG/L	1
Toluene	0.48	0.5	PQL		ND	UG/L	1
Ethylbenzene	0.44	0.5	PQL		ND	UG/L	1
Xylenes	0.51	1.0	PQL		ND	UG/L	1
Methyl-tert-butyl ether	0.16	0.5	PQL		ND	UG/L	1

Approved by: _____ Date: _____

Project Name:	OLYMPIAN/1435	Analysis:	BTEX/Gasoline Range Organics (SW8020/8015)
Project No:	01-1858	Method:	SW8020F
		Prep Meth:	SW5030B

Field ID:	MW 3	Lab Samp ID:	01-1858-03
Descr/Location:	MW 3	Rec'd Date:	12/26/2001
Sample Date:	12/26/2001	Prep Date:	12/27/2001
Sample Time:	NA	Analysis Date:	12/27/2001
Matrix:	Water	QC Batch:	12271MGBXW
Basis:	Wet	Notes:	

Analyte	Det Limit	Rep Limit		Note	Result	Units	Pvc Dil
Gasoline Range Organics	27.	50.	PQL		ND	UG/L	1
Benzene	0.26	0.5	PQL		ND	UG/L	1
Toluene	0.48	0.5	PQL		ND	UG/L	1
Ethylbenzene	0.44	0.5	PQL		ND	UG/L	1
Xylenes	0.51	1.0	PQL		ND	UG/L	1
Methyl-tert-butyl ether	0.16	0.5	PQL		ND	UG/L	1

Approved by: _____ Date: _____

Lab Report No.: 01-1858 Date: 01/03/2002 Page: 4

Project Name:	OLYMPIAN/1435	Analysis:	BTEX/Gasoline Range Organics (SW8020/8015)
Project No:	01-1858	Method:	SW8020F
		Prep Meth:	SW5030B

Field ID:	MW 4	Lab Samp ID:	01-1858-04
Descr/Location:	MW 4	Rec'd Date:	12/26/2001
Sample Date:	12/26/2001	Prep Date:	12/27/2001
Sample Time:	NA	Analysis Date:	12/27/2001
Matrix:	Water	QC Batch:	12271MGBXW
Basis:	Wet	Notes:	

Analyte	Det Limit	Rep Limit		Note	Result	Units	Pvc Dil
Gasoline Range Organics	27.	50.	PQL		ND	UG/L	1
Benzene	0.26	0.5	PQL		1.6	UG/L	1
Toluene	0.48	0.5	PQL		1.7	UG/L	1
Ethylbenzene	0.44	0.5	PQL		1.6	UG/L	1
Xylenes	0.51	1.0	PQL		4.4	UG/L	1
Methyl-tert-butyl ether	0.16	0.5	PQL		2.7	UG/L	1

Approved by: _____ Date: _____

Lab Report No.: 01-1858 Date: 01/03/2002 Page: 5

Project Name:	OLYMPIAN/1435	Analysis:	BTEX/Gasoline Range Organics (SW8020/8015)
Project No:	01-1858	Method:	SW8020F
		Prep Meth:	SW5030B
Field ID:	MW 5	Lab Samp ID:	01-1858-05
Descr/Location:	MW 5	Rec'd Date:	12/26/2001
Sample Date:	12/26/2001	Prep Date:	12/27/2001
Sample Time:	NA	Analysis Date:	12/27/2001
Matrix:	Water	QC Batch:	12271MGBXW
Basis:	Wet	Notes:	

Analyte	Det Limit	Rep Limit		Note	Result	Units	Pvc Dil
Gasoline Range Organics	27.	50.	PQL		3240.	UG/L	1
Benzene	0.26	0.5	PQL		738.	UG/L	1
Toluene	0.48	0.5	PQL		262.	UG/L	1
Ethylbenzene	0.44	0.5	PQL		218.	UG/L	1
Xylenes	0.51	1.0	PQL		626.	UG/L	1
Methyl-tert-butyl ether	0.16	0.5	PQL		66.4	UG/L	1

Approved by: _____ Date: _____

Lab Report No.: 01-1858 Date: 01/03/2002 Page: 6

Project Name:	OLYMPIAN/1435	Analysis:	BTEX/Gasoline Range Organics (SW8020/8015)
Project No:	01-1858	Method:	SW8020F
		Prep Meth:	SW5030B
Field ID:	MW 6	Lab Samp ID:	01-1858-06
Descr/Location:	MW 6	Rec'd Date:	12/26/2001
Sample Date:	12/26/2001	Prep Date:	12/27/2001
Sample Time:	NA	Analysis Date:	12/27/2001
Matrix:	Water	QC Batch:	12271MGBXW
Basis:	Wet	Notes:	

Analyte	Det Limit	Rep Limit		Note	Result	Units	Pvc Dil
Gasoline Range Organics	27.	50.	PQL		ND	UG/L	1
Benzene	0.26	0.5	PQL		ND	UG/L	1
Toluene	0.48	0.5	PQL		ND	UG/L	1
Ethylbenzene	0.44	0.5	PQL		ND	UG/L	1
Xylenes	0.51	1.0	PQL		1.4	UG/L	1
Methyl-tert-butyl ether	0.16	0.5	PQL		ND	UG/L	1

Approved by: _____ Date: _____

Lab Report No.: 01-1858 Date: 01/03/2002 Page: 7

Project Name:	OLYMPIAN/1435	Analysis:	HISTORICAL: Volatile Organic Compounds by
Project No:	01-1858	Method:	SW8260A
		Prep Meth:	SW5030B
Field ID:	MW 1	Lab Samp ID:	01-1858-01
Descr/Location:	MW 1	Rec'd Date:	12/26/2001
Sample Date:	12/26/2001	Prep Date:	01/02/2002
Sample Time:	NA	Analysis Date:	01/03/2002
Matrix:	Water	QC Batch:	12271MGBXW
Basis:	Wet	Notes:	

Analyte	Det Limit	Rep Limit		Note	Result	Units	Pvc Dil
Methyl-tert-butyl ether	0.31	5.	PQL		530.	UG/L	MS 1

Approved by: _____ Date: _____

QA/QC Report
Method Blank Summary

North State Environmental, South San Francisco, CA

Lab Report No.: 01-1858 Date: 01/03/2002

QC Batch:	12271MGBXW	Analysis:	BTEX/Gasoline Range Organics
Matrix:	Water	Method:	SW8020F
Lab Samp ID:	BLK	Prep Meth:	SW5030B
Analysis Date:	12/27/2001	Prep Date:	12/27/2001
Basis:	Wet	Notes:	

Analyte	Det Limit	Rep Limit		Note	Result	Units	Pvc Dil
Gasoline Range Organics	27.	50.	PQL		ND	UG/L	1
Benzene	0.26	0.5	PQL		ND	UG/L	1
Toluene	0.48	0.5	PQL		ND	UG/L	1
Ethylbenzene	0.44	0.5	PQL		ND	UG/L	1
Xylenes	0.51	1.0	PQL		ND	UG/L	1
Methyl-tert-butyl ether	0.16	0.5	PQL		ND	UG/L	1

QA/QC Report
Matrix Spike/Duplicate Matrix Spike Summary

North State Environmental, South San Francisco, CA

Lab Report No.: 01-1858 Date: 01/03/2002

QC Batch: 12271MGBXW
Matrix: Water
Lab Samp ID: 01-1858-03MS
Basis: Wet

Project Name: OLYMPIAN/1435 WEBSTER ST.
Project No.: 01-1858
Field ID: MW 3
Lab Ref ID: 01-1858-03

Analyte	Analysis Method	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Units		% Recoveries MS	% Recoveries DMS	% Recoveries RPD	Acceptance Criteria % Rec		Acceptance Criteria RPD
Benzene	SW8020F	100.0	100.0	ND	84.6	85.1	UG/L	ww	84.6	85.1	0.59	123-59	MSA	31MSP
Ethylbenzene	SW8020F	100.0	100.0	ND	91.	91.4	UG/L	ww	91.0	91.4	0.44	130-76	MSA	15MSP
Gasoline Range Organics	SW8020F	1000.	1000.	ND	791.	799.	UG/L	ww	79.1	79.9	1.0	133-64	MSA	25MSP
Methyl-tert-butyl ether	SW8020F	100.0	100.0	ND	79.2	76.8	UG/L	ww	79.2	76.8	3.1	121-59	MSA	28MSP
Toluene	SW8020F	100.0	100.0	ND	88.3	88.7	UG/L	ww	88.3	88.7	0.45	119-75	MSA	11MSP
Xylenes	SW8020F	300.0	300.0	ND	276.	278.	UG/L	ww	92.0	92.7	0.76	129-78	MSA	11MSP

Code List

Code	Name
!	Out of control limits
1C	First Column Result - The Value Obtained from the First Column
2C	Second Column Result - The Value Obtained from the Second Column
<	Less Than
=	Equal To
>	Greater Than
AAC	American Analytics, Chatsworth, CA
ACZ	ACZ Laboratories, Steamboat, CO
AEHA	Army Environmental Hygiene Agency (AEHA), APG, MD
AEIW	AN/EN Inc., Watsonville, CA
AELF	American Environmental Laboratories, Pensacola, FL
AENP	American Environmental Network, Portland, OR
AETB	American Environmental Testing Laboratory, Inc., Burbank, CA
ALAB	Associated Laboratories, Orange, CA
ALID	Acculabs, Inc., Davis, CA
ALPS	Alpha Analytical, Inc., Sparks, NV
ALPU	Alpha Analytical Laboratories, Ukiah, CA
ALTC	Alta Analytical Lab Incorporated, El Dorado Hills, CA
APHC	Applied Physics & Chemistry Laboratory, Chino, CA
APPL	Agriculture & Priority Pollutants Laboratories, Fresno, CA
ARDL	Applied Research and Development Lab, Inc., (ARDL) Mt. Vernon, IL
ARGC	Argon Laboratories, Ceres, CA
ARI	Analytical Resources, Inc., Seattle, WA
ASLL	American Scientific Laboratories, LLC, Los Angeles, CA
ATCA	Analytica Alaska, Inc., Anchorage, AK
ATCC	Analytica Environmental Labs, Inc., Thornton, CO
ATEM	Asbestos TEM Laboratories, Berkeley, CA
ATIA	Analytical Technologies, Inc., Anchorage, AK
ATIR	Analytical Technologies, Inc., Renton, WA
ATIS	Analytical Technologies, Inc., San Diego, CA
ATOX	Air Toxics LTD, Folsom, CA
AVTS	Advanced Technology Laboratories, Signal Hill, CA
AXYS	Axys Analytical Services, Ltd., Sidney, B.C., Canada
BAW	Bace Analytical, Windsor, CA
BCE	Brown & Caldwell Analytical Lab, Emeryville, CA
BCLB	BC Laboratories, Bakersfield, CA
BD	Blank Spike Duplicate
BLR	Basic Laboratory, Redding, CA
BMLA	Boreochem Mobile Lab & Analytical Services
BRS	Brelje & Race, Santa Rosa, CA
BS	Blank Spike
BSKL	BSK Laboratories, Inc., Fresno, CA
CALA	Castle Analytical Laboratory, Atwater, CA
CALN	Caltest Analytical Laboratory, Napa, CA
CALR	Centrum Analytical Laboratories, Inc., Riverside, CA
CALS	Centrum Analytical Laboratories, Inc., Signal Hill, CA
CASB	Columbia Analytical Services, Inc., Bothell, WA
CASD	Columbia Analytical Services, Inc., Redding, CA
CASK	Columbia Analytical Services, Inc., Kelso, WA
CASL	Columbia Analytical Services, Inc., Canoga Park, CA
CAWL	California Water Labs, Inc., Modesto, CA
CB	Calibration Blank
CC	Continuing Calibration Verification

Code	Name
CDM	CDM Federal Programs Corporation
CELG	Calscience Envrionmental Laboratories, Inc., Garden Grove, CA
CELL	Creek Environmental Laboratories, Inc., San Luis Obispo, CA
CELR	Chevron Environmental Laboratory, Richmond, CA
CELS	Chemical & Environmental Laboratories, Inc., Santa Fe Springs, CA
CFWM	City of Fresno Wastewater Managment, Fresno, CA
CHEM	Chemic Laboratory, San Diego, CA
CHMC	CH2M Hill Analytical Services, Corvallis, OR
CHMM	CH2M Hill Analytical Services, Montgomery, AL
CHRP	ChromaLab, Inc., Pleasanton, CA
CKY	CKY Inc., Torrance, CA
CLPA	Contract Laboratory Program Accuracy Limits for Spiked Samples
CLPCC	CLP Continuing Calibration Acceptance Criteria
CLPIC	CLP Initial Calibration Acceptance Criteria
CLPLR	Contract Laboratory Program Precision for Lab Replicates
CLPP	Contract Laboratory Program Precision Limits for Spiked Samples
CLSR	California Laboratory Services, Rancho Cordova, CA
CLTP	Clayton Environmental Consultants, Inc., Pleasanton, CA
CRLB	Century Refining (CENREF) Labs, Inc., Brighton, CO
CRLS	CRL Environmental Laboratories, Sacramento, CA
CS	Client Sample
CTB	Curtis & Tompkins, Berkeley, CA
CTE	CT&E Environmental Services, Inc., Anchorage, AK
CTEC	CT&E Environmental Services, Inc., Charleston, WV
CTEP	Cal Tech Environmental Laboratories, Inc., Paramount, CA
CTES	Chemtek Environmental Laboratories, Santa Fe Springs, CA
DCHM	DataChem Laboratories, Inc., Salt Lake City, UT
DDL	Method Defined Detection Limit
DELB	Delta Environmental Laboratories, Benicia, CA
DMAC	Del Mar Analytical, Colton, CA
DMAI	Del Mar Analytical, Irvine, CA
DMAP	Del Mar Analytical, Phoenix, AZ
DMP	D & M Laboratories, Petaluma, CA
DOWL	Dowl Engineering Alaska Test Labs, Anchorage, AK
DTAS	D-TEK Analytical Laboratories, Inc., San Diego, CA
DU	Data Unavailable
DU	Data Unavailable
EALS	Entech Analytical Labs, Inc., Santa Clara, CA
EBA	EBA
EBMU	East Bay Municipal Utility District Laboratory, Oakland, CA
ECEN	Ecology & Environment, Inc.
ECI	EcoChem, Inc., Seattle, WA
ECIP	Enviro-Chem, Inc., Pomona, CA
ECLL	Environmental Chemistry Lab at LLNL, Livermore, CA
EEIS	Envirodyne Engineers, Inc., St. Louis, MO
EELR	Excelchem Environmental Labs, Roseville, CA
EMAS	EnviroMatrix Analytical, Inc., San Diego, CA
EMXT	EMAX Laboratories, Inc., Torrance, CA
EQL	Estimated Quantitation Limit
EQLS	Environmental Quality Laboratory at UTC, San Jose, CA
ESBR	E. S. Babcock & Sons, Inc., Riverside, CA
ETCS	ETC, Santa Rosa, CA
FGIS	Frontier Geosciences, Inc., Seattle, WA
FGL	Fruit Growers Laboratory, Inc., Stockton, CA
FGLE	FGL Environmental, Santa Paula, CA

Code	Name
FORA	Forensic Analytical
GALM	GeoAnalytical Laboratories, Inc., Modesto, CA
GELC	General Engineering Laboratories, Inc., Charleston, SC
GENC	GTEL Environmental Labs, Inc., Concord, CA
HALB	Halcyon Laboratories, Bakersfield, CA
HEAA	Hall Environmental Analysis Laboratory, Albuquerque, NM
HPLE	HP Labs, Escondido, CA
IC	Initial Calibration Verification
IDL	Instrument Detection Limit
IN	Internal Standard
JEIF	Jones Environmental, Inc., Fullerton, CA
KD	Known (External Reference Material) Duplicate
KIC	KIC Lab, Prudhoe Bay, AK
KIFF	Kiff Analytical LLC, Davis, CA
KPIS	KPrime, Inc., Santa Rosa, CA
LAB1	Laboratory 1
LAB2	Laboratory 2
LAL	Lockheed Analytical Laboratory, Las Vegas, NV
LASL	Los Alamos Scientific Laboratory, Los Alamos, NM
LB	Lab Blank
LCC	Laboratory Continuing Calibration Accuracy
LDC	Laboratory Data Consultants
LIC	Laboratory Initial Calibration Accuracy
LL	Lancaster Laboratories, Inc., Lancaster, PA
LLD	Lowest Level of Detection
LLR	Laboratory Established Precision for Lab Replicates
LOQ	Limit of Quantitation
LR	Lab Replicate
LSA	Laboratory Sample Accuracy for Spiked Samples
LSP	Laboratory Sample Precision for Spiked Samples
LTL	Laucks Testing Lab, Inc.
MCAP	McCampbell Analytical, Pacheco, CA
MCLL	Mobile Chem Labs, Inc., Lafayette, CA
MDL	Method Detection Limit
MEA	Method Established Accuracy for Spiked Samples
MEC	MEC Analytical Systems, Inc., Carlsbad, CA
MECC	Method Established Continuing Calibration Acceptance Criteria
MEIC	Method Established Initial Calibration Acceptance Criteria
MELR	Method Established Precision for Laboratory Replicates
MEP	Method Established Precision for Spiked Samples
MLIC	Michelson Laboratories, Inc., Commerce, CA
MLR	Matrix Laboratory Replicate Precision
MOLE	Mobile One Laboratories, Inc., Escondido, CA
MRL	Method Reporting Limit (lowest standard adjusted for prep.)
MS	GC/MS Result - Value Confirmed Using GC/MS
MS	Lab Matrix Spike
MSA	Matrix Spike Accuracy for Spiked Samples
MSP	Matrix Spike Precision for Spiked Samples
MSSL	Mountain States Analytical, Salt Lake City, UT
MWLP	Montgomery Watson Laboratories, Pasadena, CA
NA	Not Applicable
NA	Not Available - Result Not Available
NC	Non-Client Sample
NCAB	North Creek Analytical, Bothell, WA
NCAC	North Creek Analytical, Bend, OR

Code	Name
NCAP	North Creek Analytical, Beaverton, OR
NCAS	North Creek Analytical, Spokane, WA
NCLA	North Coast Laboratories, Arcata, CA
ND	Not Detected
NR	Not Reported - Data Not Reported
NRES	Navy Regional Environmental Lab, San Diego, CA
NSEF	North State Environmental, South San Francisco, CA
NTL	Northern Testing Laboratories, Anchorage, AK
NTLF	Northern Testing Laboratories, Fairbanks, AK
NU	Not Usable - Data Not Usable
NWCC	Northwest Colorado Consultants, Inc., Steamboat Springs, CO
OECS	Oilfield Environmental and Compliance, Santa Maria, CA
OEIR	OnSite Environmental, Inc., Redmond, WA
PAC	Pacific Analytical, Carlsbad, CA
PAIS	Performance Analytical, Inc., Simi Valley, CA
PARA	Paragon Analytics, Inc., CO
PASA	Pace Analytical Services, Inc., Asheville, NC
PASC	Pace Analytical Services, Inc., Huntersville, NC
PASH	Pace Analytical Services, Inc., Houston, TX
PASI	Pace Analytical Services, Inc., Indianapolis, IN
PASN	Pace Analytical Services, Inc., St. Rose, LA
PCL	Pat-Chem Laboratories, Moorpark, CA
PHLE	Philip Environmental
PIC	Pace Analytical Services, Inc., Camarillo, CA
PIHB	Pace Analytical Services, Inc., Huntington Beach, CA
PIL	Pace Analytical Services, Inc., Lenexa, KS
PIM	Pace Analytical Services, Inc., Minneapolis, MN
PIN	Pace Analytical Services, Inc., Novato, CA
PINY	Pace Analytical Services, Inc., New York, NY
PIP	Pace Analytical Services, Inc., Pittsburgh, PA
PITB	Pace Analytical Services, Inc., Tampa Bay, FL
PIWF	Pace Analytical Services, Inc., Wappingers Falls, NY
PLSA	Positive Lab Service, Los Angeles, CA
PQL	Practical Quantitation Limit
PR	Primary Result - The Primary Result for a Parameter
PRL	Parameter Range Limit
QALA	Quality Analytical Laboratores, Inc., Montgomery, AL
QALC	Quality Analytical Laboratories, Inc., Redding, CA
RFWC	Roy F. Weston, West Chester, PA
RFWS	Roy F. Weston, Stockton, CA
RM	Known (External Reference Material)
RS	Reagent Solvent
SALR	Shasta Analytical Laboratory, Inc., Redding, CA
SAS	Sound Analytical Services, Inc., Tacoma, WA
SBSA	Both Reagent and Matrix Sample Accuracy for Surrogates
SBSP	Both Reagent and Matrix Sample Precision for Surrogates
SC3S	S-Cubed, A Division of Maxwell Laboratories, Inc., San Diego, CA
SCLA	Contract Laboratory Program Limits for Surrogate Accuracy
SCLP	Contract Laboratory Program Limits for Surrogate Precision
SCST	Southern California Soil & Testing, Inc., San Diego, CA
SD	Lab Matrix Spike Duplicate
SDGE	Environmental Analysis Lab, SDGE, San Diego, CA
SEMS	Sierra Environmental Monitoring, Sparks, NV
SEQC	Sequoia Analytical Laboratories, Inc., San Carlos, CA
SEQM	Sequoia Analytical Laboratories, Inc., Morgan Hill, CA

Code	Name
SEQP	Sequoia Analytical Laboratories, Inc., Petaluma, CA
SEQS	Sequoia Analytical Laboratories, Inc., Sacramento, CA
SEQW	Sequoia Analytical Laboratories, Inc., Walnut Creek, CA
SHLH	Sherwood Labs Corporation, Hilmar, CA
SIRL	Sierra Analytical Labs, Inc., Laguna Hills, CA
SLSA	Laboratory Sample Limits for Accuracy for Surrogates
SLSP	Laboratory Sample Limits for Precision for Surrogates
SMEA	Method Established Limits for Accuracy for Surrogates
SMEP	Method Established Limits for Precision for Surrogates
SMSA	Sample Matrix Limits for Accuracy for Surrogates
SMSP	Sample Matrix Limits for Precision for Surrogates
SPEC	Spectra Laboratory, Inc., Tacoma, WA
SPLH	SPL Houston Laboratory, Houston, TX
SPLL	SPL Lafayette Laboratory, Scott, LA
SPLM	SPL Michigan Laboratory, Traverse City, MI
SR	Semi-Quantitative Result
SRAD	Standard Reference Accuracy Defined by Agency/Manufacturer
SRMA	Standard Reference Material Accuracy Limits Determined by Lab
SRMP	Standard Reference Material Precision Limits Determined by Lab
SRPD	Standard Reference Precision Defined by Agency/Manufacturer
SSLE	SunStar Laboratories, Inc., Encinitas, CA
SSLT	SunStar Laboratories, Inc., Tustin, CA
STCL	STL ChromaLab, Inc., Pleasanton, CA
STEH	Sierra Testing Lab, El Dorado Hills, CA
STIS	Sparger Technology, Inc., Sacramento, CA
STL1	STL Denver, Arvada, CO
STL2	Severn Trent Laboratories, Edison, NJ
STL3	STL Los Angeles, Santa Ana, CA
STL4	Severn Trent Laboratories, Miramar, FL
STL5	Severn Trent Laboratories, Newburgh, NY
STL6	Severn Trent Laboratories, Colchester, VT
STLB	Severn Trent Laboratories, Sparks, MD
STLC	Severn Trent Laboratories, North Canton, OH
STLD	Severn Trent Laboratories, Austin, TX
STLE	Severn Trent Laboratories, Tallahassee, FL
STLF	Severn Trent Laboratories, Tampa, FL
STLG	Severn Trent Laboratories, Savannah, GA
STLH	Severn Trent Laboratories, Houston, TX
STLI	Severn Trent Laboratories, Pensacola, FL
STLJ	Severn Trent Laboratories, N. Billerica, MA
STLK	STL Knoxville, Knoxville, TN
STLL	Severn Trent Laboratories, Earth City, MO
STLM	Severn Trent Laboratories, Monroe, CT
STLO	Severn Trent Laboratories, Mobile, AL
STLP	STL Pittsburgh, Pittsburgh, PA
STLQ	Severn Trent Laboratories, Amherst, NY
STLR	Severn Trent Laboratories, Richland, WA
STLS	STL Sacramento, West Sacramento, CA
STLT	Severn Trent Laboratories, Austin, TX (Quanterra)
STLU	Severn Trent Laboratories, University Park, IL
STLV	Severn Trent Laboratories, Valparaiso, IN
STLW	Severn Trent Laboratories, Westfield, MA
STLX	Severn Trent Laboratories, Tampa, FL (Savannah)
STLY	Severn Trent Laboratories, Whippany, NJ
STLZ	Severn Trent Laboratories, Corpus Christi, TX

Code	Name
STSM	Southland Technical Services, Inc., Montebello, CA
SU	Surrogate
SWAA	Shannon & Wilson, Inc., Anchorage, AK
SWLB	Southwest Laboratory, Broken Arrow, OK
SWRI	Southwest Resarch Institute, San Antonio, TX
TAN	TestAmerica - Nashville Division, Nashville, TN
TDLT	Truesdail Laboratories, Inc., Tustin, CA
TGGB	TEG, Solana Beach, CA
TI	Tentatively Identified Compound
TLF	Twining Labs, Fresno, CA
TLM	Torrent Laboratory, Milpitas, CA
TRID	Triangle Laboratories, Inc., Durham, NC
TSIW	ToxScan, Inc., Watsonville, CA
ZXEO	ZymaX envirotechnology, San Luis Obispo, CA

TEC ACCUTITE
35 South Linden Avenue
South San Francisco, CA 94080
Ph No.: (650)952 5551, Fax No.: (650)952 7631

Chain of Custody

01-1858

Client	: Olympian	Report to	David G.
Project Name	:		
Project Address	: 1435 Webster St Alameda, CA	Bill to	: TEC Accutite
Global ID	: T0600100766	P O No.	5593
Sampler	: Date : 12/26		

Turn-around Time: ASAP | 1 Day | 2 Days | 3 Days (circled) | 1 Week | 2 Weeks | Others :

Field Point ID	Sample ID	Sample Matrix	No. of Containers	Container Type	Sample Date & Time	TPHg 8015	BTEX, MTBE 8020	Remarks
1 MW1		H_2O	3	VOA's		X	X	
2 MW2						X	X	
3 MW3						X	X	
4 MW4						X	X	
5 MW5						X	X	
6 MW6		↓	↓	↓		X	X	
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

Relinquished by :	Date: 12/26/01	Time: 4:20	Received by:	Date: 12/26/01	Time: 16:20
Relinquished by :	Date:	Time:	Received by:	Date:	Time

Error Summary Log

02/06/02

EDF 1.2i All files present in deliverable.

Laboratory:	North State Environmental, South San Francisco, CA
Project Name:	OLYMPIAN/1435 WEBSTER ST.
Work Order Number:	01-1858
Global ID:	T0600100766
Lab Report Number:	01-1858

Report Summary

Labreport	Sampid	Labsampid	Mtrx	QC	Anmcode	Exmcode	Logdate	Extdate	Anadate	Lablotctl	Run	Sub
01-1858	MW 1	01-1858-01	W	CS	SW8020F	SW5030B	12/26/01	12/27/01	12/27/01	12271MGBXW	1	
01-1858	MW 1	01-1858-01	W	CS	SW8260A	SW5030B	12/26/01	01/02/02	01/03/02	12271MGBXW	1	
01-1858	MW 2	01-1858-02	W	CS	SW8020F	SW5030B	12/26/01	12/27/01	12/27/01	12271MGBXW	1	
01-1858	MW 3	01-1858-03	W	CS	SW8020F	SW5030B	12/26/01	12/27/01	12/27/01	12271MGBXW	1	
01-1858	MW 4	01-1858-04	W	CS	SW8020F	SW5030B	12/26/01	12/27/01	12/27/01	12271MGBXW	1	
01-1858	MW 5	01-1858-05	W	CS	SW8020F	SW5030B	12/26/01	12/27/01	12/27/01	12271MGBXW	1	
01-1858	MW 6	01-1858-06	W	CS	SW8020F	SW5030B	12/26/01	12/27/01	12/27/01	12271MGBXW	1	
		BLK	W	LB1	SW8020F	SW5030B	/ /	12/27/01	12/27/01	12271MGBXW	1	
		01-1858-03MS	W	MS1	SW8020F	SW5030B	/ /	12/27/01	12/27/01	12271MGBXW	1	
		01-1858-03MS	W	SD1	SW8020F	SW5030B	/ /	12/27/01	12/27/01	12271MGBXW	1	

EDFSAMP: Error Summary Log

02/06/02

Error type	Logcode	Projname	Npdlwo	Sampid	Matrix
There are no errors in this data file					

EDFTEST: Error Summary Log

02/06/02

Error type	Labsampid	Qccode	Anmcode	Exmcode	Anadate	Run number
There are no errors in this data file					/ /	0

EDFRES: Error Summary Log

02/06/02

Error type	Labsampid	Qccode	Matrix	Anmcode	Pvccode	Anadate	Run number	Parlabel
Warning: extra parameter	01-1858-01	CS	W	SW8020F	PR	12/27/01	1	MTBE
Warning: extra parameter	01-1858-01	CS	W	SW8260A	MS	01/03/02	1	MTBE
Warning: extra parameter	01-1858-02	CS	W	SW8020F	PR	12/27/01	1	MTBE
Warning: extra parameter	01-1858-03	CS	W	SW8020F	PR	12/27/01	1	MTBE
Warning: extra parameter	01-1858-03MS	MS1	W	SW8020F	PR	12/27/01	1	MTBE
Warning: extra parameter	01-1858-03MS	SD1	W	SW8020F	PR	12/27/01	1	MTBE
Warning: extra parameter	01-1858-04	CS	W	SW8020F	PR	12/27/01	1	MTBE
Warning: extra parameter	01-1858-05	CS	W	SW8020F	PR	12/27/01	1	MTBE
Warning: extra parameter	01-1858-06	CS	W	SW8020F	PR	12/27/01	1	MTBE
Warning: extra parameter	BLK	LB1	W	SW8020F	PR	12/27/01	1	MTBE

EDFQC: Error Summary Log

02/06/02

Error type	Lablotctl	Anmcode	Parlabel	Qccode	Labqcid
There are no errors in this data files					

EDFCL: Error Summary Log

02/06/02

Error type	Clrevdate	Anmcode	Exmcode	Parlabel	Clcode
There are no errors in this data file	/ /				

AB2886 Electronic Delivery

Your EDF file has been succcessfully uploaded!

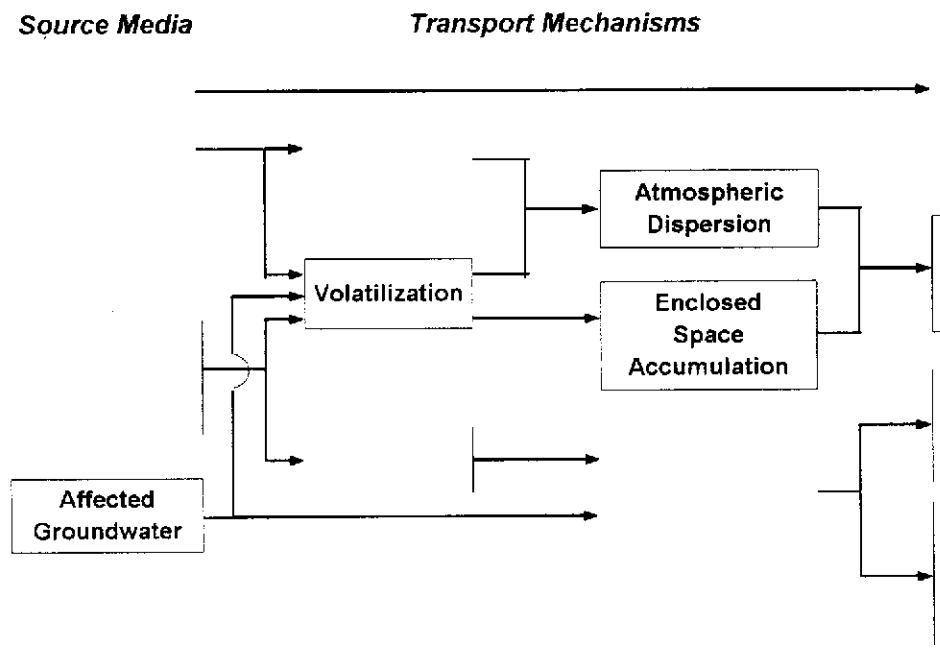
Confirmation Number:	9639365196
Date/Time of Submittal:	2/6/2002 2:19:34 PM
Facility Global ID:	T0600100766
Facility Name:	JIFFY LUBE
Submittal Title:	Fourth Quarterly Monitoring Report
Submittal Type:	GW Monitoring Report

Logged in as TEC-OLYMPIAN (AUTH_RP) CONTACT SITE ADMINISTRATOR.

Exposure Pathway Flowchart

Site Name: Webster
Location: 1435 Webster
Compl. By: Rehan

Job ID: Olympian
Date: 11-Jan-02



Receptors	On-site	Off-site1	Off-site2
	None	NA	NA
Outdoor Air:	*Residential*	*Residential*	*None*
Indoor Air:	*Residential*	*NA*	*NA*
	None	None	None
	NA	NA	NA

SOURCE → TRANSPORT → RECEPTOR

Commands and Options

Main Screen | Print Sheet | Help

Calculation Tables for 95% UCL Concentrations of Regional TPHg and Benzene

CoC	TPHg				Benzene			
Sample Date	MW-1	MW-5	Seasonal Mean x	Annual Region Mean, X	MW-1	MW-5	Seasonal Mean x	Annual Region Mean, X
3/22/01	8,600	4,300	6,450		2,600	780	1,690	
6/25/01	18,000	3,100	10,550		1,200	1,000	1,100	
9/28/01	48,000	3,000	25,500		5,200	1,200	3,200	
12/26/01	524	3,240	1,882	11,096	216	738	477	1,617

CoC	(x-X)^2	Variance (s^2) s^2=1/(n-1)∑(x-X)^2	√Variance (s^2) s	s/√n	t(0.95)*s/√n	95% UCL X+t(0.95)*s/√n
Benzene	5366 267031 2506681 1299030	1359369	1166	583	1372	2988
TPHg	21580670 297570 207489620 84888582	104752148	10235	5117	12041	23137

TPHg Fraction

TPHg=2/3 (C5-C12 Aliphatics) + 1/3 (C5 - C10) Aromatics =		23,137
Aliphatics		15425
	C5-C6	3856
	C6-C8	3856
	C8-C10	3856
	C10-C-12	3856
Aromatics		7712
	C5-C7	2571
	C7-C8	2571
	C8-C10	2571

Notes:

1. To calculate the annual regional means, monitoring wells with significant concentrations on the property were considered.
2. Annual regional means were calculated using last four quarters of monitoring data i.e. 3/22/01 through 12/26/01.
3. All numbers are concentrations in ppb.
4. The source for t-distribution value is Richard O. Gilbert, 1987, Statistical Methods for Environmental Pollution Monitoring.
5. The source for TPH fraction is Massachesetts Department of Environmental Protection, June 2001, Implementation of the MADEP VPH/EPH Approach.
6. The constituents of Aliphatics and Aromatics were assumed to be present in equal percentage.

Site-Specific Soil Parameters

Site Name: Webster
Location: 1435 Webster
Compl. By: Rehan
Job ID: Olympian
Date: 11-Jan-02

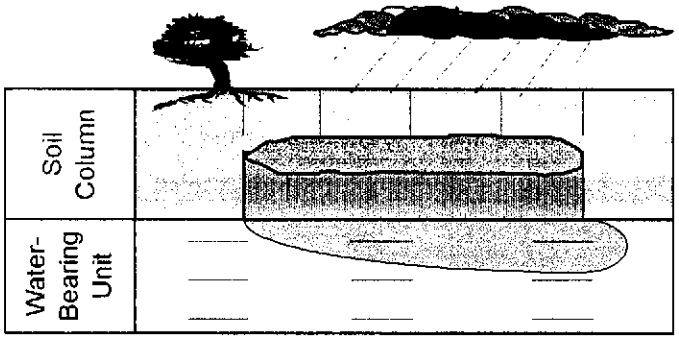
1. Soil Source Zone Characteristics

Hydrogeology

General Case Construction

Depth to water-bearing unit	9	(ft)
Capillary zone thickness	0.164041995	(ft)
Soil column thickness	8.835958005	(ft)

Affected Soil Zone



2. Surface Soil Column

Vadose Zone Capillary Fringe

Predominant USCS Soil Type

SW/SP: Sand

or

Enter Directly

or

Total porosity	0.41	(-)
Volumetric water content	0.08 / 0.369	(-)
Volumetric air content	0.33 / 0.041	(-)
Dry bulk density	1.7	(kg/L)
Vertical hydraulic conductivity	2.8E+1	(ft/d)
Vapor permeability	1.1E-11	(ft^2)
Capillary zone thickness	1.6E-1	(ft)

NA

or

Partitioning Parameters

Fraction organic carbon	0.01	(-)
Soil/water pH	6.8	(-)

3. Commands and Options

Main Screen | Use Default Values | Print Sheet
Set Units | | Help

RBCA SITE ASSESSMENT

Input Parameter Summary

Site Name: Webster
Site Location: 1435 Webster

Completed By: Rehan
Date Completed: 11-Jan-02

Job ID: Olympian

Exposure Parameters		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Construc.
AT_c	Averaging time for carcinogens (yr)	70				
AT_r	Averaging time for non-carcinogens (yr)	30			25	1
BW	Body weight (kg)	70	15	35	70	
ED	Exposure duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure frequency (days/yr)	350			250	180
EF_D	Exposure frequency for dermal exposure	350			250	
IR_w	Ingestion rate of water (L/day)	2			1	
IR_s	Ingestion rate of soil (mg/day)	100	200		50	100
SA	Skin surface area (dermal) (cm^2)	5000		2000	5000	5000
M	Soil to skin adherence factor	1				
ET_{swim}	Swimming exposure time (hr/event)	3				
EV_{swim}	Swimming event frequency (events/yr)	12	12	12		
IR_{swim}	Water ingestion while swimming (L/hr)	0.05	0.5			
SA_{swim}	Skin surface area for swimming (cm^2)	20000		8100		
IR_{fish}	Ingestion rate of fish (kg/yr)	0.025				
FI_{fish}	Contaminated fish fraction (unitless)	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	None	None
Soil Leaching to Groundwater Ingestion	None	None	None
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	None		
Outdoor Air:			
Particulates from Surface Soils	None	None	None
Volatilization from Soils	None	None	None
Volatilization from Groundwater	Residential	Residential	Commercial
Indoor Air:			
Volatilization from Subsurface Soils	None	NA	NA
Volatilization from Groundwater	Residential	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	NA	NA	(ft)
Soil leaching to groundwater receptor	NA	NA	NA	(ft)
Outdoor air inhalation receptor	0	500	0	(ft)

Target Health Risk Values		Individual	Cumulative
TR_{ab}	Target Risk (class A&B carcinogens)	1.0E-6	NA
TR_c	Target Risk (class C carcinogens)	1.0E-5	
THQ	Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	NA

Modeling Options	
RBCA tier	Tier 2
Outdoor air volatilization model	Surface & subsurface models
Indoor air volatilization model	Johnson & Ettinger model
Soil leaching model	NA
Use soil attenuation model (SAM) for leachate?	NA
Air dilution factor	3-D Gaussian dispersion
Groundwater dilution-attenuation factor	NA

NOTE: NA = Not applicable

Surface Parameters		General	Construction	(Units)
A	Source zone area	0.0E+0	NA	(ft^2)
W	Length of source-zone area parallel to wind	0.0E+0	NA	(ft)
W_{gw}	Length of source-zone area parallel to GW flow	NA		(ft)
U_{air}	Ambient air velocity in mixing zone	7.4E+0		(ft/s)
δ_{air}	Air mixing zone height	6.6E+0		(ft)
P_a	Areal particulate emission rate	NA		(g/cm^2/s)
L_{ss}	Thickness of affected surface soils	NA		(ft)

Surface Soil Column Parameters		Value			(Units)
h_{cap}	Capillary zone thickness	1.6E-1			(ft)
h_v	Vadose zone thickness	8.9E+0			(ft)
ρ_s	Soil bulk density	1.7E+0			(g/cm^3)
f_{oc}	Fraction organic carbon	1.0E-2			(-)
θ_T	Soil total porosity	4.1E-1			(-)
K_{vs}	Vertical hydraulic conductivity	2.8E+1			(ft/d)
k_v	Vapor permeability	1.1E-11			(ft^2)
L_{gw}	Depth to groundwater	9.0E+0			(ft)
L_s	Depth to top of affected soils	NA			(ft)
L_{base}	Depth to base of affected soils	NA			(ft)
L_{subs}	Thickness of affected soils	NA			(ft)
pH	Soil/groundwater pH	6.8E+0			(-)
		capillary	vadose	foundation	
θ_w	Volumetric water content	0.369	0.08	0.12	(-)
θ_a	Volumetric air content	0.041	0.33	0.26	(-)

Building Parameters		Residential	Commercial	(Units)
L_b	Building volume/area ratio	7.51E+0	NA	(ft)
A_b	Foundation area	7.53E+2	NA	(ft^2)
X_{crk}	Foundation perimeter	1.12E+2	NA	(ft)
ER	Building air exchange rate	5.50E-4	NA	(1/s)
L_{crk}	Foundation thickness	4.92E-1	NA	(ft)
Z_{crk}	Depth to bottom of foundation slab	4.92E-1	NA	(ft)
η	Foundation crack fraction	1.00E-3	NA	(-)
dP	Indoor/outdoor differential pressure	0.00E+0	NA	(g/cm/s^2)
Q_s	Convective air flow through slab	0.00E+0	NA	(ft^3/s)

Groundwater Parameters		Value	(Units)
δ_{gw}	Groundwater mixing zone depth	NA	(ft)
I_f	Net groundwater infiltration rate	NA	(in/yr)
U_{gw}	Groundwater Darcy velocity	NA	(ft/d)
V_{gw}	Groundwater seepage velocity	NA	(ft/d)
K_s	Saturated hydraulic conductivity	NA	(ft/d)
i	Groundwater gradient	NA	(-)
S_w	Width of groundwater source zone	NA	(ft)
S_d	Depth of groundwater source zone	NA	(ft)
θ_{ef}	Effective porosity in water-bearing unit	NA	(-)
f_{oc-sat}	Fraction organic carbon in water-bearing unit	NA	(-)
pH_{sat}	Groundwater pH	NA	(-)
	Biodegradation considered?	NA	

Transport Parameters		Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport		Groundwater Ingestion		Soil Leaching to GW		
α_x	Longitudinal dispersivity	NA	NA	NA	NA	(ft)
α_y	Transverse dispersivity	NA	NA	NA	NA	(ft)
α_z	Vertical dispersivity	NA	NA	NA	NA	(ft)
Lateral Outdoor Air Transport		Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
σ_y	Transverse dispersion coefficient	NA	NA	5.1E+1	NA	(ft)
σ_z	Vertical dispersion coefficient	NA	NA	3.4E+1	NA	(ft)
ADF	Air dispersion factor	NA	NA	1.4E+1	NA	(-)

Surface Water Parameters		Off-site 2	(Units)
Q_{sw}	Surface water flowrate	NA	(ft^3/s)
W_p	Width of GW plume at SW discharge	NA	(ft)
δ_{pl}	Thickness of GW plume at SW discharge	NA	(ft)
DF_{sw}	Groundwater-to-surface water dilution factor	NA	(-)

RBCA SITE ASSESSMENT

Site Name: Webster
Site Location: 1435 Webster

Completed By: Rehan
Date Completed: 11-Jan-02

Job ID: Olympian

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

Groundwater DAF Option:

SSTL Results For Complete Exposure Pathways ("X" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Groundwater Ingestion / Discharge to Surface Water			X GW Vol. to Indoor Air	X Groundwater Volatilization to Outdoor Air			Applicable SSTL	SSTL Exceeded ?	Required CRF
			On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	On-site (0 ft)	Off-site 1 (500 ft)	Off-site 2 (0 ft)			Only if "yes"
CAS No.	Name	(mg/L)	None	None	None	Residential	Residential	Residential	None	(mg/L)	"■" if yes	left
71-43-2	Benzene*	3.0E+0	NA	NA	NA	1.1E-1	2.3E+0	3.3E+1	NA	1.1E-1	■	2.6E+1
0-00-0	TPH - Aliph >C05-C06	3.9E+0	NA	NA	NA	>3.6E+1	>3.6E+1	>3.6E+1	NA	>3.6E+1	☐	NA
0-00-0	TPH - Aliph >C06-C08	3.9E+0	NA	NA	NA	>5.4E+0	>5.4E+0	>5.4E+0	NA	>5.4E+0	☐	NA
0-00-0	TPH - Aliph >C08-C10	3.9E+0	NA	NA	NA	>4.3E-1	>4.3E-1	>4.3E-1	NA	>4.3E-1	☐	NA
0-00-0	TPH - Aliph >C10-C12	3.9E+0	NA	NA	NA	>3.4E-2	>3.4E-2	>3.4E-2	NA	>3.4E-2	☐	NA
0-00-0	TPH - Arom >C05-C07	2.6E+0	NA	NA	NA	7.2E+0	1.5E+2	>1.8E+3	NA	7.2E+0	☐	<1
0-00-0	TPH - Arom >C07-C08	2.6E+0	NA	NA	NA	4.1E+2	>5.2E+2	>5.2E+2	NA	4.1E+2	☐	<1
0-00-0	TPH - Arom >C08-C10	2.6E+0	NA	NA	NA	>6.5E+1	>6.5E+1	>6.5E+1	NA	>6.5E+1	☐	NA

* = Chemical with user-specified data

">" indicates risk-based target concentration greater than constituent solubility value. NA = Not applicable. NC = Not calculated.

RBCA SITE ASSESSMENT

Input Parameter Summary

Site Name: Webster
Site Location: 1435 Webster

Completed By: Rehan
Date Completed: 11-Jan-02

Job ID: Olympian

Exposure Parameters		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Construc.
AT_c	Averaging time for carcinogens (yr)	70				
AT_n	Averaging time for non-carcinogens (yr)	30			25	1
BW	Body weight (kg)	70	15	35	70	
ED	Exposure duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure frequency (days/yr)	350			250	180
EF_D	Exposure frequency for dermal exposure	350			250	
IR_w	Ingestion rate of water (L/day)	2			1	
IR_s	Ingestion rate of soil (mg/day)	100	200		50	100
SA	Skin surface area (dermal) (cm^2)	5800		2023	5800	5800
M	Soil to skin adherence factor	1				
ET_{swim}	Swimming exposure time (hr/event)	3				
EV_{swim}	Swimming event frequency (events/yr)	12	12	12		
IR_{swim}	Water ingestion while swimming (L/hr)	0.05	0.5			
SA_{swim}	Skin surface area for swimming (cm^2)	23000		8100		
IR_{fish}	Ingestion rate of fish (kg/yr)	0.025				
FI_{fish}	Contaminated fish fraction (unitless)	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	None	None
Soil Leaching to Groundwater Ingestion	None	None	None
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	None		
Outdoor Air:			
Particulates from Surface Soils	None	None	None
Volatilization from Soils	None	None	None
Volatilization from Groundwater	Commercial	Commercial	None
Indoor Air:			
Volatilization from Subsurface Soils	None	NA	NA
Volatilization from Groundwater	Commercial	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	NA	NA	(ft)
Soil leaching to groundwater receptor	NA	NA	NA	(ft)
Outdoor air inhalation receptor	0	500	NA	(ft)

Target Health Risk Values		Individual	Cumulative
TR_{ab}	Target Risk (class A&B carcinogens)	1.0E-5	NA
TR_c	Target Risk (class C carcinogens)	1.0E-5	
THQ	Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	NA

Modeling Options	
RBCA tier	Tier 2
Outdoor air volatilization model	Surface & subsurface models
Indoor air volatilization model	Johnson & Ettinger model
Soil leaching model	NA
Use soil attenuation model (SAM) for leachate?	NA
Air dilution factor	3-D Gaussian dispersion
Groundwater dilution-attenuation factor	NA

NOTE: NA = Not applicable

Surface Parameters		General	Construction	(Units)
A	Source zone area	0.0E+0	NA	(ft^2)
W	Length of source-zone area parallel to wind	0.0E+0	NA	(ft)
W_{gw}	Length of source-zone area parallel to GW flow	NA		(ft)
U_{air}	Ambient air velocity in mixing zone	1.5E+1		(ft/s)
δ_{air}	Air mixing zone height	6.6E+0		(ft)
P_a	Areal particulate emission rate	NA		(g/cm^2/s)
L_{ss}	Thickness of effected surface soils	NA		(ft)

Surface Soil Column Parameters		Value			(Units)
h_{cap}	Capillary zone thickness	1.6E-1			(ft)
h_v	Vadose zone thickness	8.8E+0			(ft)
ρ_s	Soil bulk density	1.7E+0			(g/cm^3)
f_{oc}	Fraction organic carbon	6.0E-3			(-)
θ_T	Soil total porosity	4.1E-1			(-)
K_{vs}	Vertical hydraulic conductivity	2.8E+1			(ft/d)
k_v	Vapor permeability	1.1E-11			(ft^2)
L_{gw}	Depth to groundwater	9.0E+0			(ft)
L_s	Depth to top of affected soils	NA			(ft)
L_{base}	Depth to base of affected soils	NA			(ft)
L_{subs}	Thickness of affected soils	NA			(ft)
pH	Soil/groundwater pH	6.8E+0			(-)
		capillary	vadose	foundation	
θ_w	Volumetric water content	0.369	0.08	0.12	(-)
θ_a	Volumetric air content	0.041	0.33	0.26	(-)

Building Parameters		Residential	Commercial	(Units)
L_b	Building volume/area ratio	NA	1.00E+1	(ft)
A_b	Foundation area	NA	7.53E+2	(ft^2)
X_{crk}	Foundation perimeter	NA	1.12E+2	(ft)
ER	Building air exchange rate	NA	1.38E-3	(1/s)
L_{crk}	Foundation thickness	NA	4.92E-1	(ft)
Z_{crk}	Depth to bottom of foundation slab	NA	4.92E-1	(ft)
η	Foundation crack fraction	NA	1.00E-3	(-)
dP	Indoor/outdoor differential pressure	NA	0.00E+0	(g/cm/s^2)
Q_s	Convective air flow through slab	NA	0.00E+0	(ft^3/s)

Groundwater Parameters		Value	(Units)
δ_{gw}	Groundwater mixing zone depth	NA	(ft)
I_f	Net groundwater infiltration rate	NA	(in/yr)
U_{gw}	Groundwater Darcy velocity	NA	(ft/d)
V_{gw}	Groundwater seepage velocity	NA	(ft/d)
K_s	Saturated hydraulic conductivity	NA	(ft/d)
I	Groundwater gradient	NA	(-)
S_w	Width of groundwater source zone	NA	(ft)
S_d	Depth of groundwater source zone	NA	(ft)
θ_{ef}	Effective porosity in water-bearing unit	NA	(-)
f_{oc-sat}	Fraction organic carbon in water-bearing unit	NA	(-)
pH_{sat}	Groundwater pH	NA	(-)
	Biodegradation considered?	NA	

Transport Parameters		Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport		Groundwater Ingestion		Soil Leaching to GW		
α_x	Longitudinal dispersivity	NA	NA	NA	NA	(ft)
α_y	Transverse dispersivity	NA	NA	NA	NA	(ft)
α_z	Vertical dispersivity	NA	NA	NA	NA	(ft)
Lateral Outdoor Air Transport		Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
σ_y	Transverse dispersion coefficient	NA	NA	5.1E+1	NA	(ft)
σ_z	Vertical dispersion coefficient	NA	NA	3.4E+1	NA	(ft)
ADF	Air dispersion factor	NA	NA	1.4E+1	NA	(-)

Surface Water Parameters		Off-site 2	(Units)
Q_{sw}	Surface water flowrate	NA	(ft^3/s)
W_{pl}	Width of GW plume at SW discharge	NA	(ft)
δ_{pl}	Thickness of GW plume at SW discharge	NA	(ft)
DF_{sw}	Groundwater-to-surface water dilution factor	NA	(-)

RBCA SITE ASSESSMENT

Site Name: Webster | Completed By: Rehan | Job ID: Olympian

Site Location: 1435 Webster | Date Completed: 11-Jan-02

GROUNDWATER SSTL VALUES

Target Risk (Class A & B): 1.0E-5

Target Risk (Class C): 1.0E-5

Target Hazard Quotient: 1.0E+0

Groundwater DAF Option:

SSTL Results For Complete Exposure Pathways ("X" If Complete)

			Groundwater Ingestion / Discharge to Surface Water			X GW Vol. to Indoor Air	X Groundwater Volatilization to Outdoor Air			Applicable SSTL	SSTL Exceeded ?	Required CRF
CONSTITUENTS OF CONCERN		Representative Concentration	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	On-site (0 ft)	Off-site 1 (500 ft)	Off-site 2 (0 ft)			Only if "yes" left
CAS No.	Name	(mg/L)	None	None	None	Commercial	Commercial	Commercial	None	(mg/L)	"■" if yes	
71-43-2	Benzene*	3.0E+0	NA	NA	NA	6.4E+0	8.0E+1	1.2E+3	NA	6.4E+0	☐	<1
0-00-0	TPH - Aliph >C05-C06	3.9E+0	NA	NA	NA	>3.6E+1	>3.6E+1	>3.6E+1	NA	>3.6E+1	☐	NA
0-00-0	TPH - Aliph >C06-C08	3.9E+0	NA	NA	NA	>5.4E+0	>5.4E+0	>5.4E+0	NA	>5.4E+0	☐	NA
0-00-0	TPH - Aliph >C08-C10	3.9E+0	NA	NA	NA	>4.3E-1	>4.3E-1	>4.3E-1	NA	>4.3E-1	☐	NA
0-00-0	TPH - Aliph >C10-C12	3.9E+0	NA	NA	NA	>3.4E-2	>3.4E-2	>3.4E-2	NA	>3.4E-2	☐	NA
0-00-0	TPH - Arom >C05-C07	2.6E+0	NA	NA	NA	3.4E+1	4.4E+2	>1.8E+3	NA	3.4E+1	☐	<1
0-00-0	TPH - Arom >C07-C08	2.6E+0	NA	NA	NA	>5.2E+2	>5.2E+2	>5.2E+2	NA	>5.2E+2	☐	NA
0-00-0	TPH - Arom >C08-C10	2.6E+0	NA	NA	NA	>6.5E+1	>6.5E+1	>6.5E+1	NA	>6.5E+1	☐	NA

* = Chemical with user-specified data

">" indicates risk-based target concentration greater than constituent solubility value NA = Not applicable. NC = Not calculated.

CHEMICAL DATA FOR SELECTED COCs

Physical Property Data

Constituent	CAS Number	type	Molecular Weight (g/mole) MW	ref	Diffusion Coefficients in air (cm2/s) Dair	ref	Diffusion Coefficients in water (cm2/s) Dwat	ref	log (Koc) or log(Kd) (@ 20 - 25 C) log(L/kg) partition		ref	Henry's Law Constant (@ 20 - 25 C) (atm-m3/mol)	(unitless)	ref	Vapor Pressure (@ 20 - 25 C) (mm Hg)	ref	Solubility (@ 20 - 25 C) (mg/L)	ref	acid pKa	base pKb	ref
Benzene*	71-43-2	A	78.1	PS	8.80E-02	PS	9.80E-06	PS	1.79	Koc	PS	5.55E-03	2.29E-01	PS	9.52E+01	PS	1.75E+03	PS	-	-	-
TPH - Aliph >C05-C06	0-00-0	T	81	T	1.00E-01	T	1.00E-05	T	2.90	Koc	T	7.88E-01	3.25E+01	T	2.66E+02	-	3.60E+01	T	-	-	-
TPH - Aliph >C06-C08	0-00-0	T	100	T	1.00E-01	T	1.00E-05	T	3.60	Koc	T	1.17E+00	4.81E+01	T	4.79E+01	-	5.40E+00	T	-	-	-
TPH - Aliph >C08-C10	0-00-0	T	130	T	1.00E-01	T	1.00E-05	T	4.50	Koc	T	1.90E+00	7.85E+01	T	4.79E+00	-	4.30E-01	T	-	-	-
TPH - Aliph >C10-C12	0-00-0	T	160	T	1.00E-01	T	1.00E-05	T	5.40	Koc	T	2.96E+00	1.22E+02	T	4.79E-01	-	3.40E-02	T	-	-	-
TPH - Arom >C05-C07	0-00-0	T	78	T	1.00E-01	T	1.00E-05	T	1.90	Koc	T	5.63E-03	2.32E-01	T	9.88E+01	-	1.80E+03	T	-	-	-
TPH - Arom >C07-C08	0-00-0	T	92	T	1.00E-01	T	1.00E-05	T	2.40	Koc	T	6.72E-03	2.77E-01	T	2.89E+01	-	5.20E+02	T	-	-	-
TPH - Arom >C08-C10	0-00-0	T	120	T	1.00E-01	T	1.00E-05	T	3.20	Koc	T	1.16E-02	4.80E-01	T	4.79E+00	-	6.50E+01	T	-	-	-

* = Chemical with user-specified data

Site Name: Webster

Completed By: Rehan

Job ID: Olympian

Site Location: 1435 Webster

Date Completed: 11-Jan-02

CHEMICAL DATA FOR SELECTED COCs

Toxicity Data

	Reference Dose (mg/kg/day)				Reference Conc. (mg/m3)		Slope Factors 1/(mg/kg/day)				Unit Risk Factor 1/(µg/m3)			
Constituent	Oral RfD_oral	ref	Dermal RfD_dermal (mg/kg/day)	ref	Inhalation RfC_inhal	ref	Oral SF_oral	ref	Dermal SF_dermal 1/(mg/kg/day)	ref	Inhalation URF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
Benzene*	3.00E-03	R	-	-	5.95E-03	R	1.00E-01	CE	2.99E-02	TX	2.86E-05	CE	A	TRUE
TPH - Aliph >C05-C06	5.00E+00	T	-	-	1.84E+01	T	-	-	-	-	-	-	D	FALSE
TPH - Aliph >C06-C08	5.00E+00	T	-	-	1.84E+01	T	-	-	-	-	-	-	D	FALSE
TPH - Aliph >C08-C10	1.00E-01	T	-	-	1.00E+00	T	-	-	-	-	-	-	D	FALSE
TPH - Aliph >C10-C12	1.00E-01	T	-	-	1.00E+00	T	-	-	-	-	-	-	D	FALSE
TPH - Arom >C05-C07	3.00E-03	R	-	-	5.95E-03	R	-	-	-	-	-	-	D	FALSE
TPH - Arom >C07-C08	2.00E-01	T	-	-	4.00E-01	T	-	-	-	-	-	-	D	FALSE
TPH - Arom >C08-C10	4.00E-02	T	-	-	2.00E-01	T	-	-	-	-	-	-	D	FALSE

* = Chemical with user-specified

Site Name: Webster

Site Location: 1435 Webster

Miscellaneous Chemical Data

Constituent	Maximum Contaminant Level MCL (mg/L)	ref	Time-Weighted Average Workplace Criteria TWA (mg/m3)	ref	Aquatic Life Prot. Criteria AQL (mg/L)	ref	Biocon-centration Factor (L-wat/kg-fish)
Benzene*	5.00E-03	-	3.25E+00	-	-	-	12.6
TPH - Aliph >C05-C06	-	-	-	-	-	-	1
TPH - Aliph >C06-C08	-	-	-	-	-	-	1
TPH - Aliph >C08-C10	-	-	-	-	-	-	1
TPH - Aliph >C10-C12	-	-	-	-	-	-	1
TPH - Arom >C05-C07	-	-	-	-	-	-	1
TPH - Arom >C07-C08	-	-	-	-	-	-	1
TPH - Arom >C08-C10	-	-	-	-	-	-	1

* = Chemical with user-specified

Site Name: Webster

Site Location: 1435 Webster

CHEMICAL DATA FOR SELECTED COCs

Miscellaneous Chemical Data

Constituent	Dermal Relative Absorp. Factor (unitless)	Water Dermal Permeability Data: Dermal Permeability Coeff. (cm/hr)	Lag time for Dermal Exposure (hr)	Critical Exposure Time (hr)	Relative Contr of Derm Perm Coeff (unitless)	Water/Skin Derm Adsorp Factor (cm/event)	ref	Detection Limits: Groundwater (mg/L)	ref	Soil (mg/kg)	ref	Half Life (First-Order Decay) (days): Saturated	Unsaturated	ref
Benzene*	0.5	0.021	0.26	0.63	0.013	7.3E-2	D	0.002	S	0.005	S	720	720	H
TPH - Aliph >C05-C06	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH - Aliph >C06-C08	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH - Aliph >C08-C10	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH - Aliph >C10-C12	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH - Arom >C05-C07	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH - Arom >C07-C08	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH - Arom >C08-C10	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-

* = Chemical with user-specified

Site Name: Webster

Site Location: 1435 Webster

RBCA SITE ASSESSMENT

Chemical-Specific Tier 2 Cleanup Summary

Site Name: Webster
Site Location: 1435 Webster

Completed By: Rehan
Date Completed: 11-Jan-02

Definitions

Site-Specific Target Level Concentrations	
SSTLgw	Site-specific target level for groundwater (mg/L)
SSTLs	Site-specific target level for soil (mg/kg)
RBELair	Risk-based exposure limit for air (µg/m3)
THQ	Target hazard quotient
TR	Target risk

Cross-Media Transfer Factors	
VF_{ss}	Volatilization factor, surface soil to outdoor air (kg-soil/L-air)
VF_{samb}	Volatilization factor, subsurface soil to outdoor air (kg-soil/L-air)
VF_{wamb}	Volatilization factor, groundwater to outdoor air (L-wat/L-air)
VF_{sesp}	Volatilization factor, subsurface soil to indoor air (kg-soil/L-air)
VF_{wesp}	Volatilization factor, groundwater to indoor air (L-wat/L-air)
LF	Leaching factor, soil to groundwater (kg-soil/L-wat)

Cross-Media Transfer Factors	
DAF_{gw}	Dilution-attenuation factor, groundwater (-)
$DAF_{s/gw}$	Dilution-attenuation factor, soil leaching to groundwater (-)

Physical Properties	
MW	Molecular weight (g/mol)
Sol	Aqueous solubility limit (mg/L)
P_{vap}	Vapor pressure (mmHg)
H_{atm}	Henry's Law constant (atm-m^3/mol)
pK_a	Acid ionization constant (log[mol/mol])
pK_b	Base ionization constant (log[mol/mol])
K_{oc}	Organic carbon/Water partition coeffiecient (L/kg)
K_d	Soil/Water distribution coeffient (L/kg)
D_{air}	Molecular diffusion coeffient in air (cm^2/sec)
D_{wat}	Molecular diffusion coeffient in water (cm^2/sec)

Toxicity Data	
Wt of Evd.	Weight of evidence
SF_o	Oral slope factor for carcinogens (1/[mg/kg/day])
SF_d	Dermal slope factor for carcinogens (1/[mg/kg/day])
URF_i	Inhalation unit risk facor for carcinogens (1/[µg/m^3])
RfD_o	Oral reference dose (mg/kg/day)
RfD_d	Dermal reference dose (mg/kg/day)
RfC_i	Inhalation reference concentration (mg/m^3)

Dermal Exposure Parameters	
RAF_d	Dermal relative absorption factor (mg/mg)
K_p	Dermal permeability coeff. (cm/hr)
tau_d	Lag time for dermal exposure (hr/event)
t_{crit}	Critical exposure time (hr)
B	Relative contribution of permeability coeff. (-)

Regulatory Standards	
MCL	Maximum contaminant level for drinking water protection (mg/L)
TWA	Time-weighted average workplace air criterion (mg/m^3)
AQL	Aquatic life protection criterion (mg/L)

Miscellaneous Parameters	
ADL_{gw}	Analytical detection limit in groundwater (mg/L)
ADL_s	Analytical detection limit in soil (mg/kg)
$t_{1/2,sat}$	Half life, saturated zone (d)
$t_{1/2,unsat}$	Half life, unsaturated zone (d)

Derived Parameters	
H	Dimensionless Henry's Law contant (L-wat/L-air)
K_{sw}	Soil to pore-water partitioning factor (L-wat/kg-soil)
C_{sat}	Saturated residual conc. in vadose zone soils (mg/kg-soil)
$C_{sat,vap}$	Saturated concentration in vapors (mg/m3-air)
$D_{eff,s}$	Effective diffusion coeff. in vadose zone soils (cm^2/sec)
$D_{eff,crk}$	Effective diffusion coeff. in foundation cracks (cm^2/sec)
$D_{eff,cap}$	Effective diffusion coeff. in capillary zone (cm^2/sec)
$D_{eff,ws}$	Effective diffusion coeff., water table to ground surface (cm^2/sec)
R_{sat}	Retardation factor, saturated zone (-)
R_{unsat}	Retardation factor, unsaturated zone (-)
Z	Water to skin dermal absorption factor (cm/event)

Chemical Parameter References

PS	Standard Provisional Guide for Risk-Based Corrective Action, ASTM PS 104-98.
A	Emergency Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, ASTM,
D	USEPA, Dermal Exposure Assessment: Principles and Applications, ORD, EPA/600/8-91/011B.
H	Howard, Handbook of Environmental Degradation Rates, Lewis Publishers, Chelsea, MI, 1989
R	EPA Region III Risk Based Concentration Table, EPA Region 3, March 7, 1995.
S	USEPA, Test Methods for Evaluating Solid Waste, SW-846, Third Edition, OSWER, November 1986.
T	TPH Criteria Working Group, 1996.
TX	TNRCC Risk-Based Corrective Action for Leaking Storage Tank Sites, January 1994.
3	based on Kow from (2) and DiToro, D. M., 1985."A Particle Interaction Model of Reversible Organic Chemical Sorption", Chemosphere, 14(10), 1505-1538. log(Koc) = 0.00028 + 0.983 log(Kow)
4	USEPA, 1989: Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF) - USEPA, OAQPS, Air Emission Models, (EPA-450/3-87-026)
5	Verschueren, Karel, 1983: Handbook of Environmental data on organic Chemicals, Second Ed., (Van nostrand Reinhold Company Inc., New York), ISBN: 0-442-28802-6.
6	Calculated diffusivity using the method of Fuller, Schettler, and Giddings from (9).
7	Calculated diffusivity using the method of Hayduk and Laudie and the reference from (9)
8	Calculated using Kenaga ang Goring Kow/solubility regression equation reference (9) and Kow data from (2). log(S, mg/l) = -0.922 log(Kow) + 4.184
9	Handbook of Chemical Property Estimation Methods, 1982, W.J. Lyman, (McGraw-Hill, New York), ISBN - 0-07-039175-0.
10	Calculated from (Pv/Patm)(solubility/mol wt).
11	Back calculated from solubility, Note (8) and (3).
12	Aldrich Chemical Catalog, 1991.
13	Calculated using Modified Watson Correlation from (9) and normal boiling point.
14	USEPA, 1979: Water Related Environmental Fate of 129 Priority Pollutants, Vol.1, USEPA, OWQPS,(EPA-4404-79-029a).
15	The Agrochemicals Handbook, (The Royal Society of Chemistry, The University, Nottingham, England), ISBN 0-85186-406-6.
16	Vapor pressure specified at elevated temperature, adjustments to 25C using methods presented by (9).
17	Wauchope, R. D., T. M. Butler, A. G. Hornsby, P. W. M. Augustijn-Beckers, and J.P. Burt, 1992: "The SCS/ARS/CES Pesticide Properties Database for Environmental Decision Making". Reviews of Environmental Contamination and Toxicology, vol 123, 1-155.
18	Farm Chemicals Handbook 91, C. Sine, ed., (Meister Publishing Company, Willoughby, Ohio).
19	Structure and Nomenclature Search System, (Version 7.00/7.03) December, 1992.
20	From Syracuse Research Corporation Calculated Value from pcchem-pcgems, 1988, ref no. 255435 in Enirofate database, Accession no. 105543.
23	NIOSH, 1990: Pocket Guide to Chemical Hazards, (U. S. Dept. of Health & Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health).
24	Buchter, B. et al., 1989: Correlation of Freundlich Kd and N retention Parameters with Soils and Elements, Soil Science, 148, 370-379.
25	USEPA, 1993: Air/Superfund National Technical Guidance Study series; Estimation of Air Impacts for Thermal Desorption Units Used at Superfund Sites, US Environmental Protection Agency, Office of Air Quality Planning and Standards, EPA-451/R-93-005.
26	NTIS Accession No. PB93-215630, April 1993.
27	Based on salt solubilities in Table 3-120, R.H. Perry and D. W. Green, " Perry's Chemical Engineering Handbook" Sixth Edition, (McGraw-Hill, New York), 1973.
28	Based on salt solubilities in Table of Physical Constants for Inorganic Compounds, Weast, R. C., CRC Handbook of Chemistry and Physics, 67th edition, (CRC Press, Inc., Boca Raton), 1987.
29	Montgomery and Welkom, "Groundwater Chemicals Desk Reference", Lewis Publishers, Chelsea, MI, 1990.
30	USEPA, 1996: Soil Screening Guidance: Technical Background Doc., (EPA/540/R-95/128)
31	TNRCC Risk Reduction Rule Implementation, July 23, 1998. (update to Reference "TX")
32	USEPA, Method 8270C, Revision 3, "Semivolatile Organic Compounds by GC/MS", December 1996.
33	40 CFR 131.36, July 1, 1997
34	40 CFR 141.23, July 1, 1997
35	USEPA, Manual for the Certification of Laboratories Analyzing Drinking Water, EPA 815-B-97-001, March 1997
36	Calculated using Chiou et al. equation reported in (9); S (µmol/L) from (15).
37	Calculated using Chiou et al. equation reported in (9); S (µmol/L) from (23).
38	Calculated using Chiou et al. equation reported in (9); S (µmol/L) from (4).