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FINAL

GROUNDWATER SAMPLING REPORT AND REQUEST FOR CLOSURE, UST SITE 210620

Revision 0
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MARINE CORPS BASE CAMP PENDLETON, CALIFORNIA

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ABBREVIATIONS AND ACRONYMS

µg/L	micrograms per liter
amsl	above mean sea level
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
DEH	Department of Environmental Health
DO	dissolved oxygen
EPA	U.S. Environmental Protection Agency
ft/ft	feet per foot
FWENC	Foster Wheeler Environmental Corporation
J	estimated value
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MCB	Marine Corps Base
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
MTBE	methyl tert-butyl ether
ORP	oxidation/reduction potential
QC	quality control
RL	reporting limit
RPD	relative percent difference
TBA	tert-butyl alcohol
TPH-d	total extractable petroleum hydrocarbons quantified as diesel
TPH-g	total petroleum hydrocarbons quantified as gasoline
TtEC	Tetra Tech EC, Inc.
UST	Underground Storage Tank
VOC	volatile organic compound
WB	California Water Board
WQO	Water Quality Objective

1.0 INTRODUCTION

This Groundwater Monitoring Report, prepared by SES-TECH, a joint venture between Sealaska Environmental Services LLC and Tetra Tech EC, Inc. (TtEC), presents the results of groundwater sampling completed in September 2005 at Underground Storage Tank (UST) Site 210620, Marine Corps Base (MCB) Camp Pendleton, California. This groundwater sampling event was conducted in response to a request from the California Water Board (WB) in a letter dated February 15, 2005 (reference: SMC:50-3592.05:peurp) for quarterly groundwater sampling. In the letter the WB stated it would perform an assessment as to whether site closure is warranted after at least two additional quarterly sampling events were completed. This event is the second quarterly event completed subsequent to the WB's request.

The groundwater monitoring and associated reporting activities were performed under Contract Task Order No. 0004 for the U.S. Department of the Navy, Naval Facilities Engineering Command, Southwest Contract No. N68711-04-D-1104.

1.1 SCOPE OF WORK

Groundwater sampling at UST Site 210620 included measuring water levels and collecting groundwater samples which were sent to a laboratory for analysis. Pursuant to the WB's request in the February 15, 2005 letter, 6 of the 12 wells onsite (MW4, MW6, MW7, MW9, MW10, and MW12) were sampled using low-flow sampling techniques for benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl tert-butyl ether (MTBE).

1.2 SITE IDENTIFICATION

Site identification data is summarized below:

Site Address:	Building 210620, 21 Area Camp Pendleton, California 92055
Facility Name:	Gasoline Service Station
RWQCB Case No.:	9UT3443
Environmental Health and Safety Case No.:	HO5939-320
Responsible Party:	United States Marine Corps
Contact Person:	Mr. Chet Storrs, Remediation Branch Manager Assistant Chief of Staff, Environmental Security Building 22165, Box 555008 MCB Camp Pendleton, California 92055-5008 (760) 725-9774

1.3 SITE BACKGROUND

UST Site 210620 is an active gasoline service station in the 21 Area of MCB Camp Pendleton, California (Figure 1-1), located adjacent to Building 210620 in a relatively flat, asphalt and concrete-paved area. Brief descriptions of previous site activities are included below.

1.3.1 Tank Replacement

In January 1997, three USTs and ancillary piping were removed from the site by the Marine Corps. No soil discoloration was observed during removal of the USTs and ancillary piping; however, hydrocarbon odors were detected. Following removal of the USTs, the tank cavity was over-excavated, and soil samples were collected from the floor and sidewalls of the excavation and at pipe connections. Soil samples were analyzed for total petroleum hydrocarbons quantified as gasoline (TPH-g), total petroleum hydrocarbons quantified as diesel (TPH-d), BTEX, and total lead. The highest levels of TPH-g, TPH-d, and lead (420 milligrams per kilogram (mg/kg), 270 mg/kg, and 3.4 mg/kg, respectively) were detected in samples collected from the floor of the tank cavity. BTEX compounds were not detected above the laboratory reporting limit (RL) of 0.5 mg/kg.

Following UST removal and over-excavation activities, new USTs were installed in the same tank cavity.

1.3.2 Site Assessment

Following UST replacement, a site assessment was conducted (Brown and Caldwell, 1999). Results from the site assessment indicated that groundwater had been affected primarily by MTBE up to 23,300 micrograms per liter (µg/L). With the exception of soil samples collected at the capillary fringe near affected groundwater at approximately 50 feet below ground surface (bgs), MTBE was not detected in soil samples collected during this investigation. Three borings located outside the area of MTBE-contaminated groundwater were converted to groundwater monitoring wells (MW1 through MW3) and sampled. No petroleum hydrocarbons or associated volatile organic compounds (VOCs) were detected in groundwater samples collected from those wells. However, lead was detected at 0.7 milligrams per liter (mg/L) in well MW2, located 250 feet east, upgradient of the source area.

1.3.3 Additional Site Characterization

Between October and November 2000, seven additional groundwater monitoring wells (MW4 through MW10) were installed to better define the vertical and horizontal extent of MTBE in groundwater [Foster Wheeler Environmental Corporation (FWENC), 2001]. Two monitoring wells, identified as MW5 and MW9, were installed deeper than the other wells at the site, with screened intervals approximately 25 to 30 feet below the groundwater table (approximately 75

feet to 80 feet bgs) in order to evaluate the vertical extent of MTBE-contaminated groundwater. The remaining wells were screened across the groundwater table at approximately 50 feet bgs.

To determine if subsurface soil was contaminated by gasoline constituents, soil samples were collected from the vadose zone at 40.5 feet bgs in boring SB3/MW4, which was advanced adjacent to the former tank cavity. TPH-g, MTBE, tert-butyl alcohol (TBA), and total lead were detected at concentrations of 0.28 mg/kg, 3.8 mg/kg, 1.3 mg/kg, and 6.0 mg/kg, respectively (FWENC, 2001).

1.3.4 Additional Well Installation

Between January 30, 2002, and February 1, 2002, one groundwater monitoring well was destroyed and two new groundwater monitoring wells (MW11 and MW12) were installed (FWENC, 2002). Monitoring well MW3, installed in June 1998 (Brown and Caldwell, 1999), was destroyed because the well casing had been compromised by tree roots, which inhibited the collection of groundwater samples. Monitoring well MW11 was installed near former well MW3, but farther from the large tree suspected of interfering with the well. Well MW12 was installed downgradient of well MW7, where elevated levels of contaminants had been previously detected (FWENC, 2002).

On April 8, 2003, one new groundwater monitoring well (MW13) was installed to further enhance the groundwater monitoring well network at the site (FWENC, 2003). Well MW13 is located approximately 250 feet to the west of the tank cavity.

1.3.5 Groundwater Monitoring Program

After the additional site characterization was completed in 2000 (see Section 1.3.3), a multi-year groundwater monitoring program began. Groundwater samples were collected quarterly from all wells in 2001, and semiannually from 2002 through January 2005. Throughout the monitoring program, samples were analyzed for TPH-g, VOCs (including BTEX, MTBE and other fuel oxygenates), and total lead.

1.4 SITE GEOLOGY AND HYDROGEOLOGY

The native lithology encountered during the site investigations primarily consisted of poorly graded sand, silty sand, and sandy silt to depths of approximately 75 feet bgs.

The site is relatively flat and predominantly covered by asphalt. Runoff percolates into the subsurface in localized open grass and landscaped areas.

Groundwater at the site, as measured during the most recent sampling event completed in September 2005, was encountered between approximately 46.5 to 51.9 feet bgs. During the September 2005 event, groundwater beneath UST Site 210620 flowed to the west with an approximate gradient of 0.01 feet per foot (ft/ft).

There are no water supply wells located within 1 mile of the site, and the Pacific Ocean is located approximately 2,500 feet to the west of the site.

2.0 SUMMARY OF FIELD ACTIVITIES

The following sections summarize the September 2005 groundwater monitoring event conducted at UST Site 210620.

2.1 WATER LEVEL MEASUREMENTS

Prior to groundwater sampling, the depth to water was measured in each well and recorded on water level measurement logs (Appendix A). The depths were measured from the top of the casing in each well. Table 2-1 is a record of current and historical groundwater elevation data.

2.2 SAMPLING METHODOLOGY

On September 8, 2005, six of the 12 monitoring wells at the site (MW4, MW6, MW7, MW9, MW10, and MW12) were purged and sampled in accordance with the low-flow sampling guidance provided in the San Diego County Department of Environmental Health (DEH) *Site Assessment and Mitigation Manual 2005* (DEH, 2005).

The wells were purged using dedicated 2-inch Grundfos submersible pumps placed at the approximate mid-point of the water column within the screened portion of the well. A water level probe was lowered to the water table surface to monitor drawdown, which was kept to a minimum due to the low-flow pumping rates. To minimize drawdown, the flow rate for each well was adjusted to obtain a stabilized water level. While purging, the water level surface was periodically monitored to ensure that the water level did not exceed the minimum drawdown goal of 0.33 feet. To ensure the collection of a representative groundwater sample, temperature, pH, electrical conductivity, turbidity, dissolved oxygen (DO), and oxidation/reduction potential (ORP) were continuously monitored using an in-line flow cell (closed) system. These measurements were recorded for each well on well sampling logs (Appendix A). Each well was considered purged once the water quality parameters stabilized.

After purging, groundwater samples were collected through the dedicated or new disposable discharge hose. Each sample was collected in the appropriate containers for the analyses performed, labeled, and placed in a cooler with ice immediately after sample collection for delivery to the analytical laboratory.

All non-disposable sampling equipment, such as the water-level meter, were thoroughly decontaminated prior to sample collection at each well location. The decontamination procedure consisted of a potable water rinse and nonphosphate detergent wash, followed by a potable water rinse and a deionized water rinse.

2.3 SAMPLE ANALYSIS

Groundwater samples were analyzed for BTEX and MTBE by U.S Environmental Protection Agency (EPA) Method 8021B.

2.4 WASTE MANAGEMENT

All equipment decontamination water and groundwater generated from well purging and sampling were temporarily contained in a mobile polyethylene tank at the site and later transferred to a liquid storage drum located at the project trailer in the 21 Area of MCB Camp Pendleton. The drum was closed, marked, labeled, and located to minimize traffic hazards and to discourage tampering. The wastewater was transported off site for disposal at a waste-permitted facility. Wastes were not stored on site longer than 60 days. The handling, management, transportation, and disposal of wastewater were conducted in accordance with state and federal laws and regulations. A copy of the waste manifest is provided in Appendix B.

3.0 GROUNDWATER MONITORING RESULTS

Groundwater flow and analytical results from the September 2005 groundwater monitoring event are discussed in the following sections.

3.1 GROUNDWATER FLOW DIRECTION

Groundwater elevation contours for the September 2005 groundwater monitoring event are presented in Figure 3-1. Groundwater elevations at the site ranged from 6.30 feet above mean sea level (amsl) at MW8, to 9.10 feet amsl at MW2. As previously mentioned, Table 2-1 is a historical record of the measured groundwater elevation data from the site, and Figure 3-1 illustrates the groundwater flow direction during the September 2005 event, which was to the west with an approximate gradient of 0.01 ft/ft.

3.2 ANALYTICAL RESULTS

A total of eight groundwater samples (including a field duplicate and a trip blank) were collected during the groundwater monitoring event and sent to EMAX Laboratories, Inc. for analysis. The analytical results were successfully uploaded to the WB Geotracker database (Confirmation No. 8635706722). A summary of laboratory results for groundwater samples is presented in Tables 3-1 and 3-2, and depicted on Figure 3-1.

Because UST Site 210620 is located west of Interstate 5 near the Pacific Ocean, applicable regulatory standards used were those established by the WB, Division of Water Quality, *Amendment of the Water Quality Control Plan for Ocean Waters of California* (California Ocean Plan) (WB, 1997). The California Ocean Plan Water Quality Objectives (WQOs) are presented in Table 3-1.

MTBE was detected in samples collected from MW4, MW6, MW7, MW10, and MW12 at concentrations ranging from 1.4 μg/L to 220 μg/L (Table 3-1 and Figure 3-1). The highest concentration of MTBE was detected in MW12, located approximately 360 feet west of the tank cavity. MTBE was not detected in the deep well sampled (MW9). A California Ocean Plan WQO for MTBE has not been established.

Benzene, toluene, ethylbenzene, and total xylenes were not detected at any of the wells sampled (see Table 3-1 and Figure 3-1).

Field measurements of DO and ORP were performed at each well sampled, and are summarized in Table 3-2. Well sampling data sheets with the recorded ORP and DO readings for each well sampled are provided in Appendix A.

A copy of the analytical laboratory report and the chain-of-custody form are provided in Appendix C.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

This section summarizes the quality assurance and quality control (QC) results for the September 2005 groundwater monitoring event.

All groundwater samples were collected and preserved in accordance with the *San Diego County DEH Site Assessment and Mitigation Manual 2005* (DEH, 2005), and were delivered to the analytical laboratory within 24 hours of sample collection by a laboratory courier and analyzed within the method-specified analytical holding times. EMAX Laboratories, Inc., a state of California-certified and Naval Facility Engineering Service Center-evaluated laboratory, performed sample analyses.

One field duplicate sample was collected from monitoring well MW4 (identified as 0004-044). The analytical results for the duplicate sample correlated well with the primary sample results (identified as 0004-043). The relative percent difference (RPD) between results for detected analytes, such as MTBE, was 26 percent, demonstrating close agreement between the field duplicate results.

To assess potential cross-contamination of analytes during sample transport, one set of trip blank samples (identified as 0004-040) was sent along with groundwater samples to the laboratory and analyzed for BTEX and MTBE. Detectable levels of BTEX or MTBE were not reported above half the project RLs in the trip blank sample.

In accordance with the analytical method specifications, method blanks, surrogate spikes, laboratory control samples (LCSs), and LCS duplicates (LCSDs) were analyzed to assess method accuracy and precision. A set of matrix spike (MS) and matrix spike duplicate (MSD) samples (0004-042) were also provided to the laboratory during this sampling event.

No detectable levels of BTEX or MTBE were found in the method blanks during this event. Percent recoveries in LCS, LCSD, MS, MSD, and surrogate samples, including RPDs between spiked duplicates, were well within the project-specified QC acceptance limits.

In accordance with the Sampling and Analysis Plan (FWENC, 2003), Laboratory Data Consultants, Inc., a third-party validation company located in Carlsbad, California, performed EPA Level III/IV validation of analytical data. For this sampling event, one sample was validated according to the EPA Level IV protocol, and seven samples (including field QC samples) were validated according to the EPA Level III protocol. The validation reported that all of the applicable validation criteria were met for all samples with one minor exception. Percent difference in the continuing calibration verification analysis slightly exceeded the acceptance window, which required J flags for some of the sample results.

5.0 SUMMARY AND REQUEST FOR CLOSURE

After reviewing the Final Corrective Action Plan for UST Site 210620 (Tetra Tech FW, 2004), the WB requested (in a letter dated February 15, 2005, reference: SMC:50-3592.05:peurp) post-remedial groundwater monitoring be performed on a quarterly basis. The WB also stated it would perform an assessment as to whether site closure is warranted after two additional groundwater events are completed. This event is the second quarterly event completed subsequent to the WB's request; one event was completed in June 2005 (SES-TECH, 2005), and the other event was completed in September 2005 (described in this report).

The analytical results for both the June 2005 and the September 2005 groundwater sampling events were successfully uploaded to the WB Geotracker database (Confirmation Nos. 4071707069 and 8635706722). The groundwater flow direction and hydraulic gradient observed in September 2005 were similar to those observed during previous events completed at the site. Based on water level measurements recorded during this sampling event, groundwater beneath the site continues to flow toward the west with a shallow gradient.

Analytical results from the most recent sampling event, September 2005, indicate that MTBE is still present in groundwater beneath the site. MTBE was reported in groundwater up to 220 μg/L. However, the WB California Ocean Plan (WB, 1997) does not have a WQO established for MTBE (the site is located west of Interstate 5; therefore, drinking WQOs are not applicable). MTBE was not detected in the deep well that was sampled, indicating that vertical migration of MTBE is still not occurring.

Results of groundwater monitoring completed at the site since 2001 indicate, overall, that contaminant concentrations have significantly decreased with time (Table 3-1). During previous investigations aquifer soil samples were shown to contain biomass specifically capable of degrading MTBE (Tetra Tech FW, 2004), and biomarker trap and groundwater samples were shown to contain viable biomass also capable of degrading site contaminants (Tetra Tech FW, 2004). In addition, routine groundwater monitoring data showing a depletion of DO and nitrate, decreased ORP, and the presence of iron (II) in samples from wells where MTBE is present relative to samples from wells where it is absent, suggest that biological oxidation of groundwater contaminants is occurring. Biodegradative processes are believed to have significantly contributed to the long-term continuing contaminant attenuation in groundwater, and it is believed that the biodegradation will continue to occur in the future.

In summary, two quarterly groundwater sampling events have been completed since the WB requested additional sampling. Data indicate that the long-term trend of decreasing MTBE concentrations is continuing. Therefore, since the contaminant source has been remediated with soil vapor extraction (Tetra Tech FW, 2004), natural attenuation has been shown to be occurring

at the site (Tetra Tech FW, 2004), MTBE-degrading organisms have been identified in the subsurface (Tetra Tech FW, 2004), sensitive receptors are not expected to be impacted (Tetra Tech FW, 2004), and groundwater does not have any beneficial uses, closure with No Further Action is again requested for UST Site 210620. Closure with No Further Action was originally requested in the Final Corrective Action Plan submitted for review in 2004 (Tetra Tech FW, 2004). It is inherent in this request that the natural attenuation of MTBE will continue in the future as it has in the past.

6.0 REFERENCES

Brown and Caldwell. 1999. *Final Site Assessment Report UST Site 210620. Marine Corps Base Camp Pendleton, San Diego County, California.*

California Water Board (WB), Division of Water Quality. 1997. *Amendment of the Water Quality Control Plan for Ocean Waters of California (California Ocean Plan).*

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San Diego County Department of Environmental Health (DEH), Land and Water Quality Division. 2005. *San Diego County Site Assessment and Mitigation Manual 2005.*

SES-TECH. 2005. *Final Groundwater Sampling Report, Underground Storage Tank Site 210620, Marine Corps Base Camp Pendleton, California*. July.

Tetra Tech FW, Inc. 2004. *Final Corrective Action Plan with Soil Vapor Extraction Pilot Test Results, Underground Storage Tank Site 210620, Marine Corps Base Camp Pendleton, California, Revision 0.* June.

TABLES

TABLE 2-1

SUMMARY OF WATER LEVEL ELEVATIONS
UST SITE 210620, MCB CAMP PENDLETON, CA

Monitoring Well ID	Well Screen Interval (feet btoc)	Reference Point (toc) Elevation (feet amsl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)
MW1	45 - 60	57.24	17-Aug-98[1]	50.63	6.61
			1-Feb-01	50.71	6.53
			23-Apr-01	50.40	6.84
			30-Jul-01	50.63	6.61
			22-Oct-01	50.89	6.35
			1-May-02	50.93	6.31
			15-Oct-02	50.96	6.28
			29-Apr-03	50.34	6.90
			6-Oct-03	50.72	6.52
			5-Jan-04	50.77	6.47
			1-Jul-04	50.99	6.25
			10-Jan-05	50.54	6.70
			2-Jun-05	49.52	7.72
			8-Sep-05	49.90	7.34
MW2	45 - 60	60.10	17-Aug-98[1]	52.10	8.00
			1-Feb-01	52.51	7.59
			23-Apr-01	52.19	7.91
			30-Jul-01	52.19	7.91
			22-Oct-01	52.41	7.69
			1-May-02	52.54	7.56
			15-Oct-02	52.57	7.53
			29-Apr-03	52.13	7.97
			6-Oct-03	52.13	7.97
			5-Jan-04	52.30	7.80
			1-Jul-04	52.55	7.55
			10-Jan-05	52.33	7.77
			2-Jun-05	49.92	10.18
			8-Sep-05	51.00	9.10
MW3	45 - 60	55.50	17-Aug-98[1]	48.85	6.65
			1-Feb-01	well obstructed	not calculated
			23-Apr-01	48.68	6.82
			30-Jul-01	well obstructed	not calculated
			22-Oct-01	well obstructed	not calculated
			well destroyed	N/A	N/A

TABLE 2-1

SUMMARY OF WATER LEVEL ELEVATIONS
UST SITE 210620, MCB CAMP PENDLETON, CA

Monitoring Well ID	Well Screen Interval (feet btoc)	Reference Point (toc) Elevation (feet amsl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)
MW4	45 - 60	58.16	1-Feb-01	51.40	6.76
			23-Apr-01	51.06	7.10
			30-Jul-01	51.22	6.94
		57.88(2)	22-Oct-01	51.23	6.65
			1-May-02	51.44	6.44
			15-Oct-02	51.40	6.48
			29-Apr-03	50.83	7.05
			(3)	(3)	(3)
			5-Jan-04	51.05	6.83
			1-Jul-04	51.28	6.60
			10-Jan-05	50.76	7.12
			2-Jun-05	50.02	7.86
			8-Sep-05	49.21	8.67
MW5 (deep)	75 - 80	58.05	1-Feb-01	51.53	6.52
			23-Apr-01	51.24	6.81
			30-Jul-01	51.37	6.68
		57.92(2)	22-Oct-01	51.35	6.57
			1-May-02	51.55	6.37
			15-Oct-02	51.57	6.35
			29-Apr-03	50.96	6.96
			6-Oct-03	51.17	6.75
			5-Jan-04	51.37	6.55
			1-Jul-04	51.53	6.39
			10-Jan-05	50.97	6.95
			2-Jun-05	50.12	7.80
			8-Sep-05	50.49	7.43

TABLE 2-1

SUMMARY OF WATER LEVEL ELEVATIONS
UST SITE 210620, MCB CAMP PENDLETON, CA

Monitoring Well ID	Well Screen Interval (feet btoc)	Reference Point (toc) Elevation (feet amsl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)
MW6	45 - 60	58.05	1-Feb-01	51.31	6.74
			23-Apr-01	51.04	7.01
			30-Jul-01	51.12	6.93
			22-Oct-01	not recorded	not calculated
			1-May-02	not recorded	not calculated
			15-Oct-02	50.78	7.27
			29-Apr-03	50.91	7.14
			6-Oct-03	51.08	6.97
			5-Jan-04	51.20	6.85
			1-Jul-04	51.05	7.00
			10-Jan-05	50.45	7.60
			2-Jun-05	49.05	9.00
			8-Sep-05	49.21	8.84
MW7	45 - 60	55.27	1-Feb-01	48.60	6.67
			23-Apr-01	48.32	6.95
			30-Jul-01	48.44	6.83
			22-Oct-01	48.68	6.59
			1-May-02	48.81	6.46
			15-Oct-02	48.42	6.85
			29-Apr-03	48.21	7.06
			6-Oct-03	48.48	6.79
			5-Jan-04	48.57	6.70
			1-Jul-04	48.78	6.49
			10-Jan-05	48.21	7.06
			2-Jun-05	47.38	7.89
			8-Sep-05	47.76	7.51

TABLE 2-1

SUMMARY OF WATER LEVEL ELEVATIONS
UST SITE 210620, MCB CAMP PENDLETON, CA

Monitoring Well ID	Well Screen Interval (feet btoc)	Reference Point (toc) Elevation (feet amsl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)
MW8	45 - 60	52.89	1-Feb-01	46.30	6.59
			23-Apr-01	46.04	6.85
			30-Jul-01	46.22	6.67
			22-Oct-01	46.48	6.41
			1-May-02	46.57	6.32
			15-Oct-02	46.60	6.29
			29-Apr-03	45.94	6.95
			6-Oct-03	46.29	6.60
			5-Jan-04	46.35	6.54
			1-Jul-04	46.57	6.32
			10-Jan-05	46.10	6.79
			2-Jun-05	45.13	7.76
			8-Sep-05	46.59	6.30
MW9 (deep)	75 - 80	59.28	1-Feb-01	52.44	6.84
			23-Apr-01	52.44	6.84
			24-Jul-01	52.57	6.71
			22-Oct-01	52.81	6.47
			1-May-02	52.96	6.32
			15-Oct-02	52.90	6.38
			29-Apr-03	52.37	6.91
			6-Oct-03	52.55	6.73
			5-Jan-04	52.72	6.56
			1-Jul-04	52.94	6.34
			10-Jan-05	52.37	6.91
			2-Jun-05	51.53	7.75
			8-Sep-05	51.87	7.41
MW10	45 - 60	59.50	1-Feb-01	52.88	6.62
			23-Apr-01	52.62	6.88
			30-Jul-01	52.71	6.79
		59.21 (2)	22-Oct-01	52.63	6.58
			1-May-02	52.81	6.40
			15-Oct-02	52.85	6.36
			6-Oct-03	52.34	6.87
			5-Jan-04	52.68	6.53
			1-Jul-04	52.80	6.41
			10-Jan-05	52.30	6.91
			2-Jun-05	51.47	7.74
			8-Sep-05	51.81	7.40

TABLE 2-1

SUMMARY OF WATER LEVEL ELEVATIONS
UST SITE 210620, MCB CAMP PENDLETON, CA

Monitoring Well ID	Well Screen Interval (feet btoc)	Reference Point (toc) Elevation (feet amsl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)
MW11	45 - 60	56.99	1-May-02	50.06	6.93
			15-Oct-02	50.60	6.39
			29-Apr-03	49.96	7.03
			5-Jan-04	49.33	7.66
			1-Jul-04	50.57	6.42
			10-Jan-05	50.00	6.99
			2-Jun-05	49.12	7.87
			8-Sep-05	49.50	7.49
MW12	45 - 60	57.13	1-May-02	50.71	6.42
			15-Oct-02	50.87	6.26
			29-Apr-03	50.22	6.91
			6-Oct-03	52.34	6.87
			5-Jan-04	50.62	6.51
			1-Jul-04	50.79	6.34
			10-Jan-05	50.39	6.74
			2-Jun-05	49.42	7.71
			8-Sep-05	49.84	7.29
MW13	45 - 60	58.31	29-Apr-03	51.43	6.88
			6-Oct-03	51.65	6.66
			5-Jan-04	51.79	6.52
			1-Jul-04	51.98	6.32
			10-Jan-05	51.58	6.73
			2-Jun-05	50.57	7.74
			8-Sep-05	50.97	7.34

Notes:

(1) Measurement taken by Ninyo and Moore
(2) Casing resurveyed in August 2000 by Frasier Engineering
(3) not recorded, water table affected by nearby soil vapor extraction well

amsl - above mean sea level
btoc - below top of casing
N/A - not applicable
MCB - Marine Corps Base
toc - top of casing
UST - Underground Storage Tank

TABLE 3-1

SUMMARY OF GROUNDWATER SAMPLING RESULTS
UST SITE 210620, MCB CAMP PENDLETON, CA

Well ID	Date Sampled	Sample ID	TPH-g[2]	Detected VOC's [1]																						
				Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	MEK	DIPE	ETBE	TAME	Chloroform	Trichloroethene	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Vinyl Chloride	Bromodichloromethane	Bromoform	Dibromochloromethane	Chloromethane[5]	Acetone*	Methylene Chloride*	Lead[6]
			mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Water Quality Objectives (California Ocean Plan)			[3]	5.9	85,000	680	10,000	13[4]	[3]	[3]	[3]	[3]	[3]	130	27	7100	130	[3]	36	130	130	130	130	[3]	[3]	2
MW1	17-Aug-98	210620-B19/MW1	--	--	--	--	--	<200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	24-Oct-00	0024-002	na	--	0.16J	--	--	0.71J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6J	--
	24-Oct-00	0024-003 (Dup)	na	--	--	--	--	0.73J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6J	--
	9-Feb-01	0024-092	--	--	--	--	--	0.85J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.3J	--	--
	24-Apr-01	0024-131	--	--	--	--	--	0.71J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10J	--	--
	31-Jul-01	0024-235	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	22-Oct-01	0024-295	--	--	--	--	--	0.29J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.27J	--
	1-May-02	0024-384	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	15-Oct-02	0024-415	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.28 J	--
	24-Apr-03	0024-486	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.65 J	--	--	--	--
	7-Oct-03	0024-548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.21 J	--
	8-Jan-04	0063-023	--[7]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.63 J	--
	1-Jul-04	0081-023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.8J	--
	10-Jan-05	0081-051	0.03 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3-Jun-05	0004-014	na	--	--	--	--	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW2	17-Aug-98	210620-B20/MW2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**700**
	24-Oct-00	0024-005	na	--	--	--	--	0.28 J	--	--	--	--	--	0.58J	--	--	--	--	--	--	--	--	--	--	2 J	--
	9-Feb-01	0024-093	--	--	--	--	--	0.77 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.9J	0.46 J	--
	24-Apr-01	0024-132	--	--	--	--	--	--	--	--	--	--	--	0.45J	--	--	--	--	--	--	--	--	--	--	--	--
	31-Jul-01	0024-238	--	--	--	--	--	--	--	--	--	--	--	0.45J	--	--	--	--	--	--	--	--	--	--	--	--
	22-Oct-01	0024-298	--	--	--	--	--	--	--	--	--	--	--	0.4J	--	--	--	--	--	--	--	--	--	--	0.26J	--
	2-May-02	0024-386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.35J	--
	16-Oct-02	0024-427	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	25-Apr-03	0024-495	--	--	--	--	--	--	--	--	--	--	--	0.31 J	--	--	--	--	--	--	--	--	--	--	--	--
	6-Oct-03	0024-535	--	--	--	--	--	--	--	--	--	--	--	0.27 J	--	--	--	--	--	--	--	--	--	--	--	--
	8-Jan-04	0063-025	--	--	--	--	--	--	--	--	--	--	--	0.39J	--	--	--	--	--	--	--	--	--	--	0.93 J	--
	1-Jul-04	0081-022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.5 J
	10-Jan-05	0081-048	0.03 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.5 J
	2-Jun-05	0004-002	na	--	0.13J	0.2J	0.6J	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW3	17-Aug-98	210620-B1/MW3	--	--	--	--	--	<200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	24-Oct-00	0024-004	na	--	0.27J	--	0.41J	1.4	--	4.5 J	--	--	--	--	--	--	--	--	--	--	--	--	--	14J	6.8	--
	9-Feb-01	Well obstruction	na	na	na	--	na	na	na	na	--	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	24-Apr-01	0024-135	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10J	--	--
	30-Jul-01	Well obstruction	na	na	na	--	na	na	na	na	--	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	22-Oct-01	Well obstruction	na	na	na	--	na	na	na	na	--	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na

TABLE 3-1

SUMMARY OF GROUNDWATER SAMPLING RESULTS
UST SITE 210620, MCB CAMP PENDLETON, CA

Well ID	Date Sampled	Sample ID	TPH-g[2]	Detected VOC's [1]																						Lead[6]
				Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	MEK	DIPE	ETBE	TAME	Chloroform	Trichloroethene	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Vinyl Chloride	Bromodichloromethane	Bromoform	Dibromochloromethane	Chloromethane[5]	Acetone*	Methylene Chloride*	
			mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Water Quality Objectives (California Ocean Plan)			[3]	5.9	85,000	680	10,000	13[4]	[3]	[3]	[3]	[3]	[3]	130	27	7100	130	[3]	36	130	130	130	130	[3]	[3]	2
MW4	12-Feb-01	0024-099	--	--	--	--	--	**2900**	330	--	--	--	6.6	--	--	--	--	--	--	--	0.35J	--	--	--	--	--
	25-Apr-01	0024-141	--	--	--	--	--	**2110**	--	--	--	--	--	--	26J	--	--	--	--	--	--	--	--	--	--	1.32 J
	25-Apr-01	0024-142(Dup)	--	--	--	--	--	**2100**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.4J	--	4.2J	1.7 J
	30-Jul-01	0024-229	--	--	--	--	--	**1200**	14 J	--	--	--	3.3J	--	--	--	--	--	--	--	--	--	--	--	--	--
	23-Oct-01	0024-301	--	--	--	--	--	**1200**	--	--	--	0.22J	3.9J	--	--	--	--	--	--	--	--	--	--	--	--	--
	2-May-02	0024-388	--	--	--	--	--	**910**	--	--	--	--	2.5J	--	--	--	--	--	--	--	--	--	--	--	0.25J	--
	2-May-02	0024-389 (Dup)	--	--	--	--	--	**940**	--	--	--	--	2.4J	--	--	--	--	--	--	--	--	--	--	--	0.27J	--
	16-Oct-02	0024-424	--	--	--	--	--	**4000**	--	--	--	--	8.5J	--	--	--	--	--	--	--	--	--	--	--	--	--
	25-Apr-03	0024-497	--	--	--	--	--	**590**	--	--	--	--	0.93 J	--	--	--	--	--	--	--	--	--	--	--	--	--
	7-Oct-03	0024-542	--	--	--	--	--	**550**	--	--	--	--	1.3 J	--	--	--	--	--	--	--	--	--	--	--	--	--
	9-Jan-04	0063-037	--	--	--	--	--	**130**	--	--	--	--	--	0.14 J	--	--	--	--	--	--	--	--	--	--	1.7 J	--
	2-Jul-04	0081-030	0.1[8]	--	--	--	--	**150**	63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.0J
	11-Jan-05	0081-052	0.03 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3-Jun-05	0004-007	na	--	--	--	--	**100**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	3-Jun-05	0004-008 (Dup)	na	--	--	--	--	**110**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	8-Sep-05	0004-41	na	--	--	--	--	**67**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW5 (deep)	12-Feb-01	0024-096	--	--	--	--	--	6.8	--	--	--	--	--	--	--	--	--	--	--	0.48 J	7.2	1.7 J	--	11 J	0.31 J	--
	12-Feb-01	0024-097 (Dup)	--	--	--	--	--	6.9	--	--	--	--	--	--	--	--	--	--	--	0.46 J	6.8	1.7 J	--	13 J	0.51 J	--
	25-Apr-01	0024-140	--	--	--	--	--	6.4	--	--	--	--	--	--	--	--	--	--	0.28 J	0.49 J	6.2	1.7 J	0.84J	9.7 J	--	**2.18 J**
	23-Oct-01	0024-305	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	23-Oct-01	0024-305	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2-May-02	0024-387	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.25 J	--
	16-Oct-02	0024-425	--	--	--	--	--	--	--	--	--	--	--	0.29 J	--	--	--	--	--	--	--	--	--	--	0.22J	--
	25-Apr-03	0024-496	--	--	--	--	--	--	--	--	--	--	--	0.35 J	--	--	--	--	--	--	--	--	--	--	--	--
	7-Oct-03	0024-540	--	--	--	--	--	--	--	--	--	--	--	0.32 J	--	--	--	--	--	--	--	--	--	--	--	--
	7-Oct-03	0024-541 (Dup)	--	--	--	--	--	--	--	--	--	--	--	0.31 J	--	--	--	--	--	--	--	--	--	--	--	--
	9-Jan-04	0063-035	--	--	--	--	--	0.44 J	--	--	--	--	--	0.39 J	--	--	--	--	--	--	--	--	--	--	1.2 J	--
	9-Jan-04	0063-036 (Dup)	--	--	--	--	--	--	--	--	--	--	--	0.37 J	--	--	--	--	--	--	--	--	--	--	1.4 J	--
	2-Jul-04	0081-031	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11-Jan-05	0081-053	0.03 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.5 J
	3-Jun-05	0004-009	na	--	--	--	--	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na

TABLE 3-1

SUMMARY OF GROUNDWATER SAMPLING RESULTS
UST SITE 210620, MCB CAMP PENDLETON, CA

Well ID	Date Sampled	Sample ID	TPH-g[2]	Detected VOC's [1]																						Lead[6]
				Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	MEK	DIPE	ETBE	TAME	Chloroform	Trichloroethene	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Vinyl Chloride	Bromodichloromethane	Bromoform	Dibromochloromethane	Chloromethane[5]	Acetone*	Methylene Chloride*	
			mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Water Quality Objectives (California Ocean Plan)			[3]	5.9	85,000	680	10,000	13[4]	[3]	[3]	[3]	[3]	[3]	130	27	7100	130	[3]	36	130	130	130	130	[3]	[3]	2
MW6	12-Feb-01	0024-100	--	--	--	--	--	**4100**	--	--	--	--	5.9	--	--	--	0.32 J	--	--	0.43 J	2.1 J	1.4 J	--	17 J	0.5 J	--
	25-Apr-01	0024-144	--	--	--	--	--	**3200**	--	--	--	--	--	--	**100**	--	--	--	--	--	--	--	24J	--	--	--
	30-Jul-01	0024-228	--	--	--	--	--	**1400**	15J	--	--	--	1.8 J	--	--	--	--	--	--	--	--	--	--	--	--	--
	23-Oct-01	0024-300	--	--	--	--	--	**1500**	--	--	--	--	3.3 J	--	--	--	--	--	--	--	--	--	--	--	--	--
	2-May-02	0024-390	--	--	--	--	--	**970**	--	--	--	--	1.5 J	--	--	--	--	--	--	--	--	--	--	--	0.22 J	--
	16-Oct-02	0024-426	--	--	--	--	--	**240**	--	--	--	--	--	2.1 J	--	--	--	--	--	5.3J	--	12 J	--	--	--	--
	25-Apr-03	0024-498	--	--	--	--	--	**1300**	--	--	--	--	2.3 J	0.61 J	--	--	--	--	--	0.89 J	--	1.1 J	--	--	0.37 J	--
	25-Apr-03	00247-499 (Dup)	--	--	--	--	--	**1300**	--	--	--	--	2.3 J	0.62 J	--	--	--	--	--	0.88 J	--	1.1 J	--	--	0.36 J	--
	7-Oct-03	0024-547	--	--	--	--	--	**320**	--	--	--	--	0.51 J	0.25 J	--	--	--	--	--	--	--	0.3 J	--	--	--	--
	9-Jan-04	0063-038	--	--	--	--	--	**160**	--	--	--	--	--	0.28 J	--	--	--	--	--	0.27 J	--	--	--	--	1.2 J	--
	2-Jul-04	0081-032	0.1[8]	--	--	--	--	**150**	62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11-Jan-05	0081-054	0.04 J	--	--	--	--	**55**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.2 J
	11-Jan-05	0081-055 (Dup)	0.03 J	--	--	--	--	**57**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2-Jun-05	0004-003	na	--	--	--	--	**17**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	8-Sep-05	0004-42	na	--	--	--	--	**21**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW7	9-Feb-01	0024-094	--	--	--	--	--	5.8	--	--	--	--	--	--	--	--	--	--	--	0.34 J	1.9 J	1.2 J	--	--	0.42 J	--
	24-Apr-01	0024-134	--	--	--	--	--	**36**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	31-Jul-01	0024-237	--	--	--	--	--	**4600**	43	--	--	--	13	--	--	--	--	--	--	--	--	--	--	--	--	--
	22-Aug-01	0024-271[9]	--	--	--	--	--	**4600**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	22-Oct-01	0024-296	--	--	--	--	--	**3900**	49	--	--	0.23 J	16	--	--	--	--	--	--	--	--	--	--	--	0.26 J	--
	2-May-02	0024-392	--	--	--	--	--	**58**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.22 J	--
	15-Oct-02	0024-417	--	--	--	--	--	0.39 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.32 J	--
	24-Apr-03	0024-488	--	--	--	--	--	**1400**	--	--	--	--	3.9 J	--	--	--	--	--	--	--	--	--	--	--	--	--
	6-Oct-03	0024-537	--	--	--	--	--	**110**	--	--	--	--	0.25 J	--	--	--	--	--	--	--	--	--	--	--	--	--
	8-Jan-04	0063-028	--	--	--	--	--	0.61 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.67 J	--
	1-Jul-04	0081-027	--	--	--	--	--	**60**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	1-Jul-04	0081-028 (Dup)	0.1[8]	--	--	--	--	**100**	--	--	--	0.7J	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10-Jan-05	0081-049	0.05 J	--	--	--	--	**170[10]**	--	--	--	--	0.4 J	--	--	--	--	--	--	--	--	--	--	--	--	--
	3-Jun-05	0004-011	na	--	--	--	--	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	8-Sep-05	0004-45	na	--	--	--	--	1.4	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW8	9-Feb-01	0024-095	--	--	--	--	--	1.3	--	--	--	--	--	--	--	--	--	--	--	0.34 J	1.8 J	1.1 J	--	--	--	--
	24-Apr-01	0024-133	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	31-Jul-01	0024-236	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	22-Oct-01	0024-297	--	--	--	--	--	--	--	--	--	--	--	0.2 J	--	--	--	--	--	--	--	--	--	--	--	--
	2-May-02	0024-391	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	15-Oct-02	0024-416	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.4 J	--
	24-Apr-03	0024-490	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6-Oct-03	0024-536	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.6 J	--	--
	8-Jan-04	0063-026	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.76 J	--
	1-Jul-04	0081-024	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10-Jan-05	0081-050	0.02 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3-Jun-05	0004-013	na	0.39J	--	--	--	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na

TABLE 3-1

SUMMARY OF GROUNDWATER SAMPLING RESULTS
UST SITE 210620, MCB CAMP PENDLETON, CA

Well ID	Date Sampled	Sample ID	TPH-g[2]	Detected VOC's [1]																						Lead[6]
				Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	MEK	DIPE	ETBE	TAME	Chloroform	Trichloroethene	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Vinyl Chloride	Bromodichloromethane	Bromoform	Dibromochloromethane	Chloromethane[5]	Acetone*	Methylene Chloride*	
			mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Water Quality Objectives (California Ocean Plan)			[3]	5.9	85,000	680	10,000	13[4]	[3]	[3]	[3]	[3]	[3]	130	27	7100	130	[3]	36	130	130	130	130	[3]	[3]	2
MW9 (deep)	12-Feb-01	0024-102	--	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--	0.52 J	2.7 J	1.8 J	--			--
	25-Apr-01	0024-138	--	0.32J	--	--	--	**16**	--	--	--	--	--	--	--	0.43 J	--	--	--	--	--	--	0.99 J	--	--	--
	30-Jul-01	0024-233	--	--	--	--	--	0.83J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	23-Oct-01	0024-302	--	--	--	--	--	0.4 4J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	1-May-02	0024-383	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	15-Oct-02	0024-421	--	--	--	--	--	0.64 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	15-Oct-02	0024-422 (Dup)	--	--	--	--	--	0.73 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.38 J	--
	24-Apr-03	0024-492	--	--	--	--	--	0.59 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	7-Oct-03	0024-545	--	--	--	--	--	0.53 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9-Jan-04	0063-033	--	--	--	--	--	0.58 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.84 J	--
	2-Jul-04	0081-035	--	--	--	--	--	0.6 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11-Jan-05	0081-059	0.03 J	--	--	--	--	0.5 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2-Jun-05	0004-005	na	--	--	--	--	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	8-Sep-05	0004-47	na	--	--	--	--	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW10	12-Feb-01	0024-101	--	--	--	--	--	**9000**	1200	--	--	--	17	--	--	--	0.52	--	--	--	0.43 J	0.35 J	--	9.7 J	0.39 J	--
	25-Apr-01	0024-145	0.051	--	--	--	--	**8700**	--	--	--	--	--	--	**260**	--	--	11 J	--	--	--	--	5.9 J	--	--	--
	30-Jul-01	0024-231	--	--	--	--	--	**7200**	110	--	--	--	21	--	--	--	0.39 J	--	--	--	--	--	--	--	--	--
	30-Jul-01	0024-232(Dup)	--	--	--	--	--	**7600**	120	--	--	--	21	--	--	--	0.37 J	--	--	--	--	--	--	--	--	--
	23-Oct-01	0024-303	--	--	--	--	--	**7100**	70	--	--	0.43 J	21	--	--	--	0.42 J	--	--	--	--	--	--	--	--	--
	23-Oct-01	0024-304(Dup)	--	--	--	--	--	**7500**	75	--	--	0.46 J	22	--	--	--	0.44 J	--	--	--	--	--	--	--	--	--
	1-May-02	0024-382	--	--	--	--	--	**4800**	120	--	0.59 J	0.4 J	13	--	--	--	0.34 J	--	--	--	--	--	--	12 J	0.28 J	--
	15-Oct-02	0024-420	--	--	--	--	--	**130**	--	--	--	--	--	1.9 J	--	--	--	--	--	5.8	3.2J	9.9	--	--	0.62 J	--
	24-Apr-03	0024-491	--	--	--	--	--	**80**	--	--	--	--	--	1.7 J	--	--	--	--	--	4.6 J		3.7 J	--	--	0.37 J	--
	7-Oct-03	0024-546	--	--	--	--	--	**520**	--	--	--	--	0.87 J	1.3 J	--	--	--	--	--	3.2 J		1.8 J	0.91 J	--	0.5 J	--
	9-Jan-04	0063-034	--	--	--	--	--	**1500**	12 J	--	--	0.13 J	3.5 J	1.2 J	--	--	--	--	--	2.6 J	--	0.76 J	0.94 J	--	0.93 J	--
	2-Jul-04	0081-036	2[8]	--	--	--	--	**3300**	2000	--	--	--	--	0.7J	--	--	--	--	--	1 J	--	--	--	9J	--	1.1J
	11-Jan-05	0081-060	0.3[8]	--	--	--	--	**3300[11]**	--	--	--	--	7	0.6 J	--	--	--	--	--	1 J	--	--	--	--	--	--
	2-Jun-05	0004-006	na	--	--	--	--	**110**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	8-Sep-05	0004-46	na	--	--	--	--	3.8	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW11	2-May-02	0024-394	--	--	--	--	--	0.49 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.21 J	--
	15-Oct-02	0024-419	--	--	--	0.21J	3.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.37 J	--
	24-Apr-03	0024-487	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6-Oct-03	0024-539	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9-Jan-04	0063-031	--	--	--	--	--	0.23 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.83 J	--
	1-Jul-04	0081-025	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	1-Jul-04	0081-026 (Dup)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11-Jan-05	0081-056	0.02 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3-Jun-05	0004-010	na	--	--	--	--	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na

TABLE 3-1

SUMMARY OF GROUNDWATER SAMPLING RESULTS
UST SITE 210620, MCB CAMP PENDLETON, CA

Well ID	Date Sampled	Sample ID	TPH-g[2]	Detected VOC's [1]																						Lead[6]
				Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	MEK	DIPE	ETBE	TAME	Chloroform	Trichloroethene	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Vinyl Chloride	Bromodichloromethane	Bromoform	Dibromochloromethane	Chloromethane[5]	Acetone*	Methylene Chloride*	
			mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Water Quality Objectives (California Ocean Plan)			[3]	5.9	85,000	680	10,000	13[4]	[3]	[3]	[3]	[3]	[3]	130	27	7100	130	[3]	36	130	130	130	130	[3]	[3]	2
MW12	2-May-02	0024-393	--	--	--	--	--	0.37 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.28 J	--
	15-Oct-02	0024-418	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.33 J	--
	24-Apr-03	0024-489	--	--	--	--	--	**7.6**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6-Oct-03	0024-538	--	--	--	--	--	**10**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4 J	--	--
	8-Jan-04	0063-027	--	--	--	--	--	**35**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.78 J	--
	2-Jul-04	0081-033	--	--	--	--	--	**51**	28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11-Jan-05	0081-057	0.1[8]	--	--	--	--	**370[12]**	--	--	--	--	0.8J	--	--	--	--	--	--	--	--	--	--	--	--	--
	3-Jun-05	0004-012	na	--	--	--	--	**270[13]**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	8-Sep-05	0004-44 (dup)	na	--	--	--	--	**170[10]**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	8-Sep-05	0004-43	na	--	--	--	--	**220[15]**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW13	25-Apr-03	0024-500	--	--	--	--	--	--	--	--	--	--	--	1.3 J	--	--	--	--	--	3.2 J	4.1 J	5.9	--	--	0.28 J	--
	7-Oct-03	0024-544	--	--	--	--	--	--	--	--	--	--	--	1.7 J	--	--	--	--	--	--	--	--	--	--	--	--
	8-Jan-04	0063-029	--	--	--	--	--	--	--	--	--	--	--	2.3 J	--	--	--	--	--	--	--	--	--	--	0.59 J	--
	8-Jan-04	0063-030 (Dup)	--	--	--	--	--	--	--	--	--	--	--	2.3 J	--	--	--	--	--	--	--	--	--	--	0.63 J	--
	2-Jul-04	0081-034	--	--	--	--	--	--	--	--	--	--	--	2J	--	--	--	--	--	--	--	--	--	--	--	1.8 J
	11-Jan-05	0081-058	0.03J	--	--	--	--	--	--	--	--	--	--	0.9J	--	--	--	--	--	--	--	--	--	--	--	1.5J
	2-Jun-05	0004-004	na	--	--	--	--	--	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
		Reporting Limit [14]	0.1	0.5	0.5	0.5	1.5	1	20	50	5	5	5	5	5	5	0.5	5	0.5	5	5	5	5	50	5	10

Notes:

Bold values exceed listed Water Quality Objective
(1) - Detected above laboratory method detection limits
(2) - Total petroleum hydrocarbons quantified as gasoline (EPA 8015B, TPH-purgeable)
(3) - No established Water Quality Objective
(4) - Drinking water Maximum Contaminant Level used
(5) - Compound detected in associated field blank
(6) - Lead by EPA Method 6010B
(7) - Presence of discrete peaks, not reported
(8) - not a typical gasoline pattern
(9) - Confirmation sample collected due to high increase in MTBE over previous event
(10) - Sample analyzed with a dilution factor of 5
(11) - Sample analyzed with a dilution factor of 100
(12) - Sample analyzed with a dilution factor of 10
(13) - Sample analyzed with a dilution factor of 20
(14) - Reporting limits are for undiluted analysis only
(15) - Sample analyzed with a dilution factor of 2.5
-- - not detected above laboratory reporting limits
* - suspected laboratory contaminant

µg/L - micrograms per liter
DIPE - di-isopropyl ether
Dup - field duplicate sample
EPA - U. S. Environmental Protection Agency
ETBE - ethyl tert-butyl ether
J - estimated value (value is greater than MDL but less than project RL)
MCB - Marine Corps Base
MEK - methyl ethyl ketone
mg/L - milligrams per liter
MTBE - methyl tert-butyl ether
na - not analyzed
TAME - tert-amyl methyl ether
TBA - tert-butyl alcohol
TPH-g - total petroleum hydrocarbons quantified as gasoline
TPH-purgeable - total purgeable petroleum hydrocarbons
UST - Underground Storage Tank
VOC - volatile organic compound (by EPA Method 8260B)

TABLE 3-2

SUMMARY OF GROUNDWATER RESULTS FOR EVALUATION OF NATURAL ATTENUATION UST SITE 210620, MCB CAMP PENDLETON, CA

Monitoring Well ID	Date Sampled	Sample ID	Chloride[1] (mg/L)	Nitrate[1] (mg/L)	Sulfate[1] (mg/L)	Iron (II)[2] (mg/L)	Dissolved Oxygen[3] (mg/L)	ORP[3] (mV)
MW4	8-Sep-05	0004-41	na	na	na	na	3.75	69
MW6	8-Sep-05	0004-42	na	na	na	na	0.92	25
MW7	8-Sep-05	0004-45	na	na	na	na	3.48	58
MW8	9-Feb-01	0024-095	156	13.3	119	--	4.42	174.2
	24-Apr-01	0024-133	132	11.4	101	--	4.39	178
	31-Jul-01	0024-236	272	15.4	283	--	4.79	88
	22-Oct-01	0024-297	204	17.5	193	--	4.75	63
	2-May-02	0024-391	182	13.5	205	--	4.79	79
	15-Oct-02	0024-416	187	13.1	147	--	3.82	101
	24-Apr-03	0024-490	183	15.4	140	--	5.1	105
	6-Oct-03	0024-536	199	14.5	140	--	5.26	120
	8-Jan-04	0063-026	197	15.5	171	--	6.2	90
	1-Jul-04	0081-024	180	14.0	130	--	5.5	48
	10-Jan-05	0081-050	240	15.0	210	--	4.59	64
	3-Jun-05	0004-013	na	na	na	na	5.73	126
	3-Jun-05	0004-013	na	na	na	na	5.73	126
MW9	12-Feb-01	0024-102	719	0.151	208	0.9	0.03	-197.7
	25-Apr-01	0024-138	804	0.113	213	--	0.07	-186
	30-Jul-01	0024-233	878	7.12	386	3.2	0.04	-152
	23-Oct-01	0024-302	826	7.49	276	3.2	--	-178
	1-May-02	0024-383	985	0.834	310	3.8	0.52	-114
	15-Oct-02	0024-421	1070	--	309	2.8	0.00	-82
	24-Apr-03	0024-492	1160	0.1	341	4.2	0.00	-102
	7-Oct-03	0024-545	1050	0.3	327	4.1	0.19	-162
	9-Jan-04	0063-033	897	0.15	386	2.6	--	-115
	2-Jul-04	0081-035	1100	<20	320	1.9	0.52	-169
	11-Jan-05	0081-059	1100	--	340	2.1	0.08	-174
	2-Jun-05	0004-006	na	na	na	na	1.00	42
	8-Sep-05	0004-46	na	na	na	na	1.83	75
MW10	12-Feb-01	0024-101	324	6.45	165	--	0.18	-121.6
	25-Apr-01	0024-145	353	8.56	269	--	0.16	200.4
	30-Jul-01	0024-231	261	6.72	250	--	0.07	60
	30-Jul-01	0024-232(Dup)	267	6.84	188	na	na	na
	23-Oct-01	0024-303	243	7.11	178	--	--	-24
	1-May-02	0024-382	241	5.58	189	--	0.29	67
	15-Oct-02	0024-420	196	10.6	199	--	0	73
	24-Apr-03	0024-491	220	8.97	215	--	0.22	69
	7-Oct-03	0024-546	248	9.77	247	--	0.25	45
	9-Jan-04	0063-034	251	7.36	216	--	0.16	76
	2-Jul-04	0081-036	210	7	190	--	0.74	35
	11-Jan-05	0081-060	230	6	200	--	0.38	35
	2-Jun-05	0004-005	na	na	na	na	0	-122
	8-Sep-05	0004-47	na	na	na	na	0	-124
MW12	2-May-02	0024-393	319	6.44	164	--	1.48	19
	15-Oct-02	0024-418	357	7.18	141	--	0.34	22
	24-Apr-03	0024-489	384	7.79	157	0.8	0.63	-8
	6-Oct-03	0024-538	608	6.59	230	--	0.40	-4
	8-Jan-04	0063-027	795	15.5	346	1.0	0.02	-33
	2-Jul-04	0081-033	860	<13	370	--	0.51	-6
	11-Jan-05	0081-057	330	3 J	120	--	0.29	8
	3-Jun-05	0004-012	na	na	na	na	1.06	-8
	8-Sep-05	0004-43	na	na	na	na	0	-77

TABLE 3-2

SUMMARY OF GROUNDWATER RESULTS FOR EVALUATION OF NATURAL ATTENUATION UST SITE 210620, MCB CAMP PENDLETON, CA

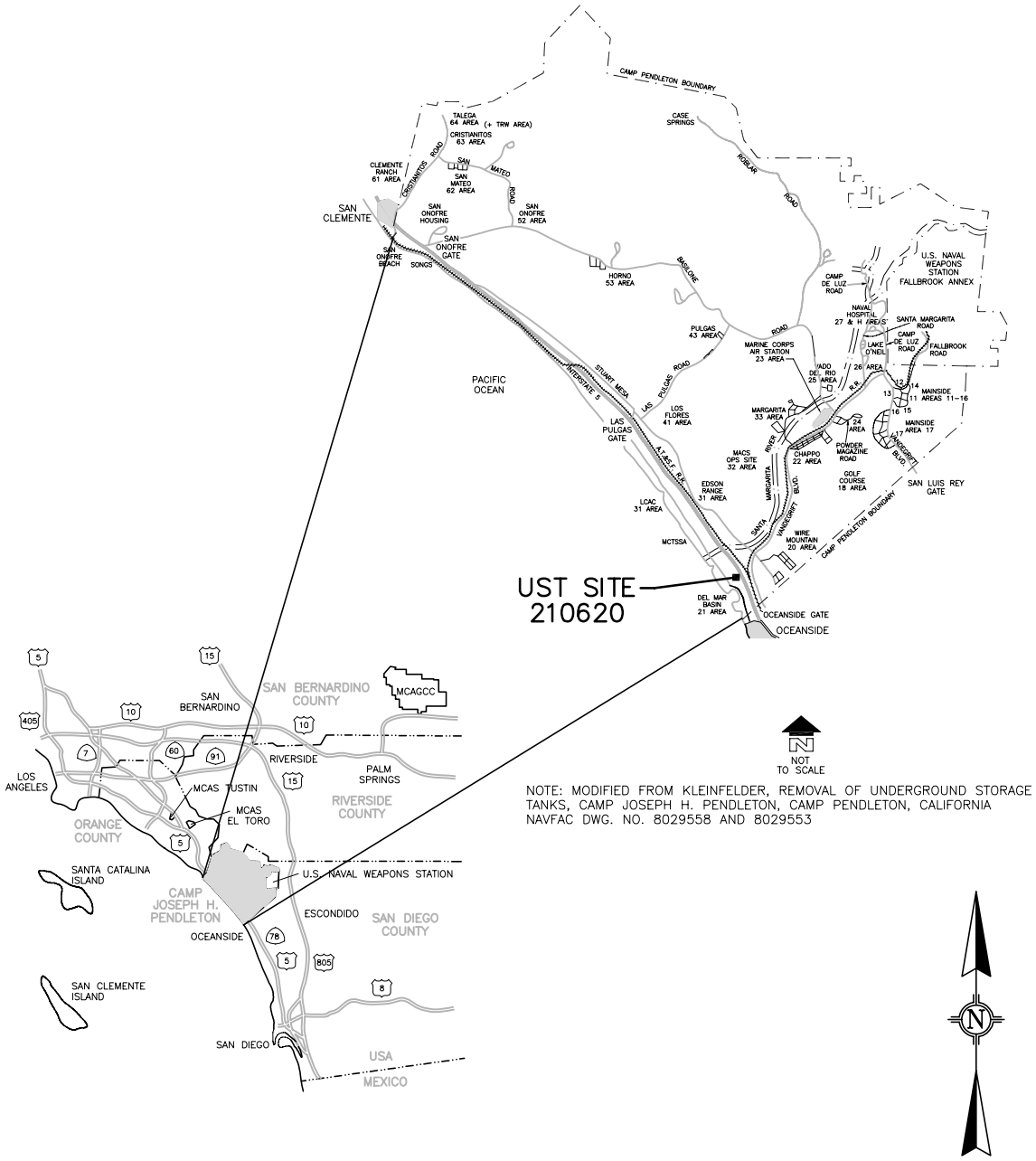
Monitoring Well ID	Date Sampled	Sample ID	Chloride[1] (mg/L)	Nitrate[1] (mg/L)	Sulfate[1] (mg/L)	Iron (II)[2] (mg/L)	Dissolved Oxygen[3] (mg/L)	ORP[3] (mV)
MW13	24-Apr-03	0024-500	255	9.01	212	--	4.35	141
	7-Oct-03	0024-544	246	5.33	245	--	2.28	65
	8-Jan-04	0063-029	224	3.19	174	--	2.48	62
	2-Jul-04	0081-034	230	6	190	--	1.94	32
	11-Jan-05	0081-058	300	15	230	--	1.96	41
	2-Jun-05	0004-004	na	na	na	na	2.83	68
		Reporting Limits	0.2	0.1	0.5	(4)	(4)	(4)

Notes:

(1) - Analyzed by EPA Method 300.0
(2) - Ferrous iron by Hach IR-18C field kit
(3) - Parameters measured using field instruments
(4) - Not applicable for field measurements
-- - not detected in field with field instrument or analytical ki
Dup - duplicate sample
EPA - U.S. Environmental Protection Agency
MCB - Marine Corps Base
mg/L - milligrams per liter
mV - millivolts
na - not analyzed
ORP - oxidation/reduction potential
UST - Underground Storage Tank

FIGURES

DRAWN BY: MD	CHECKED BY: AK	APPROVED BY: MC	DCN: SES-TECH-06-0014	DRAWING NO: 06001411.DWG
DATE: 10/25/05	REV: REVISION 0		CTO: #0004	



NOTE: MODIFIED FROM KLEINFELDER, REMOVAL OF UNDERGROUND STORAGE TANKS, CAMP JOSEPH H. PENDLETON, CAMP PENDLETON, CALIFORNIA NAVFAC DWG. NO. 8029558 AND 8029553

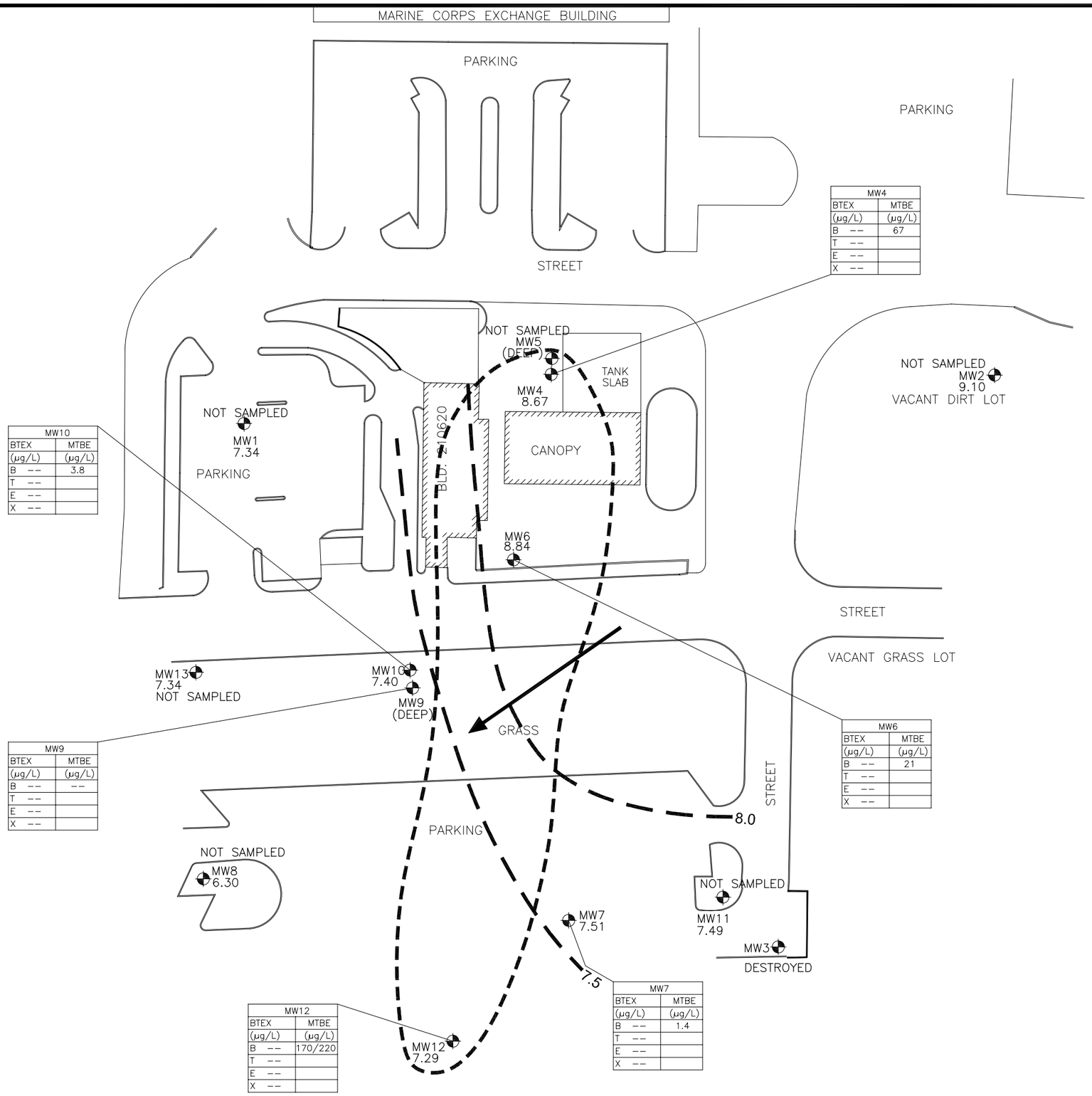
Figure 1-1

VICINITY MAP

UST SITE 210620, MCB CAMP PENDLETON

SES-TECH

P:\2973-SESTECH\CTO-0004 PENDLETON\SITE 210620\SEPT GW MONITORING REPORT\DWG\06001411.DWG
PLOT/UPDATE: OCT 25 2005 10:16:41



MW4	
BTEX	MTBE
(µg/L)	(µg/L)
B --	67
T --	
E --	
X --	

MW10	
BTEX	MTBE
(µg/L)	(µg/L)
B --	3.8
T --	
E --	
X --	

MW9	
BTEX	MTBE
(µg/L)	(µg/L)
B --	--
T --	
E --	
X --	

MW6	
BTEX	MTBE
(µg/L)	(µg/L)
B --	21
T --	
E --	
X --	

MW7	
BTEX	MTBE
(µg/L)	(µg/L)
B --	1.4
T --	
E --	
X --	

MW12	
BTEX	MTBE
(µg/L)	(µg/L)
B --	170/220
T --	
E --	
X --	

LEGEND

⊕	MONITORING WELL ID AND GROUNDWATER ELEVATION
DEEP	DEEP SCREENED MONITORING WELL (NOT CONTOURED)
	APPROXIMATE EXTENT OF MTBE – IMPACTED GROUNDWATER ABOVE THE MAXIMUM CONTAMINANT LEVEL (MCL) OF 13 ug/L
8.0	GROUNDWATER ELEVATION CONTOUR
→	GROUNDWATER FLOW DIRECTION
BTEX	BENZENE, TOLUENE, ETHYLBENZENE TOTAL XYLENES
MTBE	METHYL TERT–BUTYL ETHER
µg/L	MICROGRAMS PER LITER
--	NOT DETECTED ABOVE LABORATORY REPORTING LIMITS:
	MTBE = 5 µg/L
	BENZENE = 0.5 µg/L
	TOLUENE = 0.5 µg/L
	ETHYLBENZENE = 0.5 µg/L
	TOTAL XYLENES = 1.5 µg/L
NOT SAMPLED	NOT SAMPLED PER CALIFORNIA WATER BOARD RECOMMENDATION

0 30 60
SCALE IN FEET

BENCHMARK
THE BENCH MARK FOR THIS PROJECT IS SURVEY CONTROL POINT #1002
EL=55.544

Figure 3–1
GROUNDWATER
GRADIENT AND CONTAMINANT CONCENTRATION MAP
SEPTEMBER 2005

UST SITE 210620, MCB CAMP PENDLETON

SES-TECH

DRAWING NO: 06001431.DWG
DCN: SES-TECH-06-0014
CTO: #0004
APPROVED BY: MC
CHECKED BY: AK
REV: REVISION 0
DRAWN BY: MD
DATE: 10/25/05

P:\2973-SESTECH\CTO-0004 PENDLETON\SITE 210620\SEPT GW MONITORING REPORT\DWG\06001431.DWG
PLOT/UPDATE: NOV 01 2005 14:43:04

APPENDIX A

WELL SAMPLING LOGS

SES-TECH

Field Water Level Measurements

Date: 9/8/05
Personnel: M. Paz
W. Bryant
Weather: Sunny + Warm

Project Name: Camp Pendleton
Project OFS: UST site 210620
Measurement Device: Solinst
Comments:

Well I.D.	Depth to Water from Measuring Point (feet)	Depth to Sediment from Measuring Point (feet)	Comments
MW-2	WB ~~49.90~~ 51.00	64.69	
MW-1	49.90	64.05	
MW-6	49.21	62.19	~~roots~~, WB
MW-10	51.81	— destruction	roots in well
MW-9	51.87	84.07	
MW-13	50.97	63.59	
MW-8	46.59	62.41	
MW-12	49.84	63.87	
MW-11	49.50	62.45 WB	
MW-7	47.76	63.8333	
MW-4	49.21	61.43	
MW-5	50.49	83.71	

F:\forms\logs\water level

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: MCB Camp Pendleton
Project Number: UST site 210620
Date: 9/8/05
Site Engineer(s): W. Bryant, M. Paz

Well Number: MW-4
Equipment: Dedicated Grundfus pumps
Sample ID: 0004-41 Time: 1031
Contractor: Tetra Tech EC, Inc.

Reference: Top of Casing	Before	After
Depth to Water (ft)	49.21	49.40
Depth of Well (ft)	61.43	
Depth to Top of Screen (ft)	45	
Screen Length (ft)	15	
Pump Depth (ft)	545	
Pump Rate	700mL/min	
Sample Pump Rate	700mL/min	
System Volume (mL)	609	

Total Volume Purged (mL): 14000

System Volume (mL) = (2.4*H)+470
where
2.4mL/ft = tubing volume per foot (1/8" I.D.)
H = length of tubing in feet
470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1010									pump on
1015	7.37	820	3.79	24.67	63	2.2	49.40	3500	clear, no odor
1018	7.38	815	4.07	25.05	64	2.1	49.40	5600	clear, no odor
1021	7.39	811	4.20	25.04	67	3.8	49.40	7700	clear, no odor
1024	7.40	811	3.99	25.41	69	3.6	49.40	9800	clear, no odor
1027	7.41	812	3.77	25.43	69	3.6	49.40	11900	clear, no odor
1030	7.41	814	3.75	25.43	69	3.4	49.40	14000	clear, no odor
1031							Collect Sample		
Stability:	± 0.2 units	± 3 - 5 %	± 0.2 mg/L	± 0.3 %	± 20 mV	± 10 %			

9/8/05

Hach Fe^{2+} N/A

Controller set @ 156

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: MCB Camp Pendleton
Project Number: UST site 210620
Date: 9/8/05
Site Engineer(s): W. Bryant, M. Paz

Well Number: MW-6
Equipment: Dedicated Grundfos pump
Sample ID: 0004-42 Time: 1108
Contractor: Tetra Tech EC, Inc.

Reference: Top of Casing	Before	After
Depth to Water (ft)	49.21	49.96
Depth of Well (ft)	62.19	
Depth to Top of Screen (ft)	45	
Screen Length (ft)	15	
Pump Depth (ft)	55	
Pump Rate	600mL/min	
Sample Pump Rate	600mL/min	
System Volume (mL)	612	

Total Volume Purged (mL): 10200

System Volume (mL) = (2.4*H)+470
where
2.4mL/ft = tubing volume per foot (1/8" I.D.)
H = length of tubing in feet
470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1050									pump on
1055	7.07	1.83	1.18	24.75	29	4.9	49.80	3000	clear, no odor
1058	7.06	1.83	1.06	25.24	27	3.0	49.83	4800	clear, no odor
1101	7.06	1.84	1.00	25.62	24	1.0	49.87	6600	clear, no odor
1104	7.06	1.84	0.94	25.75	23	0.0	49.90	8400	clear, no odor
1107	7.09	1.84	0.92	26.00	25	0.0	49.96	10200	clear, no odor
1108							Collect Sample		
Stability:	± 0.2 units	± 3 - 5 %	± 0.2 mg/L	± 0.3 %	± 20 mV	± 10 %			

9/8/05

Hach Fe^{2+} N/A

to include MS/MSD
Controller set @ 157

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: MCB Camp Pendleton
Project Number: ~~9/8/05~~ UST Site 210620
Date: 9/8/05
Site Engineer(s): W. Bryant, M. Paz

Well Number: MW-7
Equipment: Retrofitted Grundfos Pumps
Sample ID: 0004-45 Time: 1329
Contractor: Tetra Tech EC, Inc.

Reference: Top of Casing	Before	After
Depth to Water (ft)	47.76	47.88
Depth of Well (ft)	63.33	
Depth to Top of Screen (ft)		
Screen Length (ft)		
Pump Depth (ft)		
Pump Rate	600 ml/min	
Sample Pump Rate	600 ml/min	
System Volume (mL)		

Total Volume Purged (mL): 12500

System Volume (mL) = (2.4*H)+470
where
2.4mL/ft = tubing volume per foot (1/8" I.D.)
H = length of tubing in feet
470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1308									pump on
1313	7.46	1.92	2.98	24.10	81	12.0	47.88	3500	clear, no odor
1316	7.44	1.92	3.06	24.30	75	9.3	47.88	5300	clear, no odor
1319	7.44	1.92	3.11	24.69	68	4.0	47.88	7100	clear, no odor
1322	7.44	1.92	3.60	25.05	59	3.3	47.88	8900	clear, no odor
1325	7.44	1.92	3.53	25.20	59	3.0	47.88	10700	clear, no odor
1328	7.45	1.92	3.48	25.25	58	2.8	47.88	12500	clear, no odor
1329									Collect samples
Stability:	± 0.2 units	± 3 - 5 %	± 0.2 mg/L	± 0.3 %	± 20 mV	± 10 %			

9/8/05

Controller set @ 157

Hach Fe^{2+} n/a

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: MCB Camp Pendleton
Project Number: UST Site 210620
Date: 8/9/05
Site Engineer(s): W. Bryant, M. Paz

Well Number: MW-9
Equipment: ~~QED Sample Pro Mini Bladder Pump~~ WB
Sample ID: 0004-46 Time: 1424
Contractor: Tetra Tech EC, Inc

Reference: Top of Casing	Before	After
Depth to Water (ft)		51.80
Depth of Well (ft)	obstructed	
Depth to Top of Screen	75.0	
Screen Length (ft)	5.0	
Pump depth (ft)	66.5	
Pump Rate	500 mL/min	
Sample Pump Rate	500 mL/min	
System Volume		

Total Volume Purged (mL): 11500

Notes/Calcs:

System Vol (mL) = (2.4*H)+470
where
2.4mL/ft = tubing volume per foot (1/8"ID)
H = length of tubing in feet
470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1400									pump off
1405	7.21	1.85	1.82	24.44	83	0.0	51.80	2500	Clear, no odor
1408	7.23	1.85	2.08	24.96	77	0.0	51.80	4000	Clear, no odor
1411	7.25	1.85	2.46	25.10	75	0.0	51.80	5500	Clear, no odor
1414	7.26	1.85	2.32	25.21	74	0.0	51.80	7000	Clear, no odor
1417	7.27	1.86	1.93	25.32	74	0.0	51.80	8500	Clear, no odor
1420	7.28	1.86	1.90	25.18	75	0.0	51.80	10000	Clear, no odor
1423	7.30	1.87	1.83	25.23	75	0.0	51.80	11500	Clear no odor
1424									Collect Sample
Stability:	± 0.2 units	± 3-5%	± 0.2 mg/L	± 0.3 %	± 20 mV	± 10%			

9/8/05

Hach Fe^{2+} N/A

Roots in well

Samples were collected directly from pump unless otherwise noted.

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: MCB Camp Pendleton
Project Number: UST Site #210620
Date: 9/8/05
Site Engineer(s): W. Bryant, M. Pay

Well Number: MW-10
Equipment: ~~QED Sample Pro Mini Bladder Pump~~ WB
Sample ID: 0004-47 Time: 1501
Contractor: Tetra Tech FW, Inc

Reference: Top of Casing	Before	After
Depth to Water (ft)	51.81	52.75
Depth of Well (ft)	~60.0	
Depth to Top of Screen	45.0	
Screen Length (ft)	15.0	
Pump depth (ft)	56.5	
Pump Rate	500 mL/min	
Sample Pump Rate	500 mL/min	
System Volume		

Total Volume Purged (mL): 10000

Notes/Calcs:

System Vol (mL) = (2.4*H)+470
where
2.4mL/ft = tubing volume per foot (1/8"ID)
H = length of tubing in feet
470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1440									Pump on
1445	7.29	4.31	0.00	23.75	-106	8.9	52.75	1500	Check DO probe
1448	7.28	4.38	0.00	24.00	-101	15.1	52.75	4000	clear, no odor
1451	7.28	4.38	0.00	24.26	-100	17.6	52.88	5500	clear, no odor
1454	7.30	4.38	0.00	24.30	-104	30.0	52.75	7000	clear, no odor
1457	7.34	4.37	0.00	24.60	-110	33.0	52.75	8500	clear, no odor
1500	7.35	4.37	0.00	24.61	-124	32.0	52.75	10000	clear no odor
1501									sample collect
Stability:	± 0.2 units	± 3-5%	± 0.2 mg/L	± 0.3 %	± 20 mV	± 10%			

WB 9/8/05

Hach Fe^{2+} N/A

Controller set @ 158
Check DO probe

Samples were collected directly from pump unless otherwise noted.

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: MCB Camp Pendleton
Project Number: UST Site 210620
Date: 9/8/05
Site Engineer(s): W. Bryant, M. Paz

Well Number: MW-12
Equipment: Dedicated Grundfos pumps
Sample ID: 0004-43 Time: 1250
Contractor: Tetra Tech EC, Inc.

Reference: Top of Casing	Before	After
Depth to Water (ft)	50.50	51.25
Depth of Well (ft)		
Depth to Top of Screen (ft)		
Screen Length (ft)		
Pump Depth (ft)		
Pump Rate	620 mL/min	
Sample Pump Rate	620 mL/min	
System Volume (mL)	614	

Total Volume Purged (mL): 11400

System Volume (mL) = (2.4*H)+470
where
2.4mL/ft = tubing volume per foot (1/8" I.D.)
H = length of tubing in feet
470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1229									pump on
1234	7.52	2.27	0.0	23.47	88	1.4	51.07	3100	clear, no odor
1237	7.51	2.31	0.0	23.94	40	1.0	51.07	4960	clear, no odor
1240	7.52	2.23	0.0	24.16	-21	0.5	51.07	6820	clear, no odor
1243	7.53	2.25	0.0	24.38	-57	0.6	51.14	7680	clear, no odor
1246	7.53	2.26	0.0	24.55	-77	0.4	51.21	9540	clear, no odor
1249	7.57	2.26	0.0	24.69	-77	0.4	51.25	11400	clear, no odor
1250									Collect sample
1255									Collect dup sample
									9/8/05
Stability:	± 0.2 units	± 3 - 5 %	± 0.2 mg/L	± 0.3 %	± 20 mV	± 10 %			

Hach Fe^{2+} N/A

Duplicate sample 0004-44
Controller set @ 163

APPENDIX B

NON-HAZARDOUS WASTE MANIFEST

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No: CA2170023533

Manifest Document No: 54504

2. Page: 1 of 1

3. Generator's Name and Mailing Address
ASSISTANT CHIEF OF STAFF
ENVIRONMENTAL SECURITY P.O. BOX 555008
CAMP PENDLETON, CA 92055-5008

4. Generator's Phone (760) 725-0189 ATTN: NATE DAGESTON

5. Transporter 1 Company Name: GENERAL ENVIRONMENTAL MANAGEMENT

6. US EPA ID Number: CAD983649880

A. State Transporter's ID

B. Transporter 1 Phone: 800-326-1011

7. Transporter 2 Company Name

8. US EPA ID Number

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
DK ENVIRONMENTAL
3650 EAST 26TH STREET
VERNON, CA 90023

10. US EPA ID Number: CAT080033681

E. State Facility's ID

F. Facility's Phone: 323-268-5056

GENERATOR

11. WASTE DESCRIPTION	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. NON HAZARDOUS LIQUID (WELL WATER)	1	DM	55	G
b. NON HAZARDOUS SOLID (WELL SOIL)	2	DM	1,500	P
c.				
d.				

G. Additional Descriptions for Materials Listed Above
11a) 1 x 55g – APPROVAL #340901-24
11b) 2 x 55g – APPROVAL #340901-23

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
EMERGENCY PHONE (800) 326-1011 (G.E.M.)

SWO# 158166

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name: NATHANIEL D. DELESTON
Signature: [signature]
Date: Month 10 Day 26 Year 05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Rudy Negrete
Signature: [signature]
Date: Month 10 Day 26 Year 05

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Date: Month Day Year

19. Discrepancy Indication Space

FACILITY

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.
Printed/Typed Name:
Signature:
Date: Month Day Year

APPENDIX C

LABORATORY REPORT
AND CHAIN-OF-CUSTODY FORM

TETRA TECH
1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

NUMBER 12435

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: Camp Pendleton	PURCHASE ORDER NO.
PROJECT LOCATION: UST Site 210620	PROJECT NO.: 2973.0040
SAMPLER NAME: Wendy Bryant	AIRBILL NUMBER: Courier
PROJECT CONTACT: Sevda Alockson	PROJECT CONTACT PHONE NUMBER: 949-756700

LABORATORY NAME: EMAX

LABORATORY ID (FOR LABORATORY): 05I068

ANALYSES REQUIRED: EPA 8021B (BTEX)

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	EPA 8021B (BTEX)	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
0004-40	9/8/05	0730	3	X		W	10 Day	X		Trip Blank			TB
0004-41	9/8/05	1031	3	X		W	10 Day	X		MW-4			Reg
0004-42	9/8/05	1108	9	X		W	10 Day	X	Include MS/MSD	MW-6			Reg
0004-43	9/8/05	1250	3		X	W	10 Day	X		MW-12			Dup
0004-44	9/8/05	1255	3	X		W	10 Day	X		MW-12			Reg
0004-45	9/8/05	1329	3	X		W	10 Day	X		MW-7			Reg
0004-46	9/8/05	1424	3	X		W	10 Day	X		MW-10			Reg
0004-47	9/8/05	1501	3	X		W	10 Day	X		MW-9			Reg

9/8/05

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

9-9-05 1400 EMAX

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: _____ SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEAL: ☐ INTACT ☐ BROKEN

Project Information Section
Do not submit to Laboratory

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

COPY

TABLE OF CONTENTS

CLIENT: **SES-TECH**

PROJECT: **CAMP PENDLETON, UST SITE 210620**

SDG: **05I068**

SECTION		PAGE
Cover Letter, COC/Sample Receipt Form		1000 – 1003
GC/MS-VOA	**	2000 –
GC/MS-SVOA	**	3000 –
GC-VOA	EPA METHOD 5030B/8021B	4000 – 4068
GC-SVOA	**	5000 –
HPLC	**	6000 –
METALS	**	7000 –
WET	**	8000 –
OTHERS	**	9000 –

** - Not Requested

EMAX LABORATORIES, INC. 1835 W. 205th Street, Torrance, CA 90501 Tel: (310) 618-8889 Fax: (310) 618-0818

received

EMAX
LABORATORIES, INC.
1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 09-20-2005
EMAX Batch No.: 051068

Attn: Sevda Aleckson

SES-TECH
1940 E. Deere Avenue, Suite 200
Santa Ana CA 92705

Subject: Laboratory Report
Project: Camp Pendleton, UST Site 210620

Enclosed is the Laboratory report for samples received on 09/09/05.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
0004-40	1068-01	09/08/05	WATER	BTEX & MTBE
0004-41	1068-02	09/08/05	WATER	BTEX & MTBE
0004-42	1068-03	09/08/05	WATER	BTEX & MTBE
0004-43	1068-04	09/08/05	WATER	BTEX & MTBE
0004-44	1068-05	09/08/05	WATER	BTEX & MTBE
0004-45	1068-06	09/08/05	WATER	BTEX & MTBE
0004-46	1068-07	09/08/05	WATER	BTEX & MTBE
0004-47	1068-08	09/08/05	WATER	BTEX & MTBE
0004-42MS	1068-03M	09/08/05	WATER	BTEX & MTBE
0004-42MSD	1068-03S	09/08/05	WATER	BTEX & MTBE

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,

Kam Y. Pang, Ph.D.
Laboratory Director

TETRA TECH
1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

NUMBER 12435

CHAIN-OF-CUSTODY RECORD

KWQ1-48 05I068

PROJECT NAME: Camp Pendleton	PURCHASE ORDER NO:
PROJECT LOCATION: UST Site 210620	PROJECT NO: 2973.0040
SAMPLER NAME: Wendy Bryant	AIRBILL NUMBER: Courier
PROJECT CONTACT: Sevda Aleckson	PROJECT CONTACT PHONE NUMBER: 949-7567500

ANALYSES REQUIRED: EPA 8021B (BTEX + MTBE) — WB 9/8/05

LABORATORY NAME: EMAX

LABORATORY ID (FOR LABORATORY): 051068

	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	EPA 8021B (BTEX + MTBE)	COMMENTS
1.	0004-40	9/8/05	0730	3	X		W	10 Day	X	
2.	0004-41	9/8/05	1031	3	X		W	10 Day	X	
3.	0004-42	9/8/05	1108	9	X		W	10 Day	X	Include MS/MSD
4.	0004-43	9/8/05	1250	3		X	W	10 Day	X	
5.	0004-44	9/8/05	1255	3	X		W	10 Day	X	
6.	0004-45	9/8/05	1329	3	X		W	10 Day	X	
7.	0004-46	9/8/05	1424	3	X		W	10 Day	X	
8.	0004-47	9/8/05	1501	3	X		W	10 Day	X	

[signature] 9/8/05

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	9-9-05	[signature]
COMPANY: TTEC	TIME: 1400	COMPANY: EMAX
RELINQUISHED BY (Signature): [signature]	DATE: 9-9-05	RECEIVED BY (Signature): [signature]
COMPANY: EMAX	TIME: 1520	COMPANY: EMAX LAB.
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: 4.5°C SAMPLE CONDITION: ☑ INTACT ☐ BROKEN
COOLER SEAL: ☑ INTACT ☐ BROKEN

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

EMA LABORATORIES

EMAX LABORATORIES

EMAX-SM02
Rev 3
Appendix 2

SAMPLE RECEIPT FORM 1

Type of Delivery	Delivered By/Airbill		
☑ EMAX Courier		ECN	05 L 068
☐ Client Delivery		Recepient	Smirnov
☐ Third Party		Date	9-9-05
		Time	15:20

COC Inspection

- ☑ Client Name
- ☑ Address
- ☑ Client PM/FC
- ☑ Tel #/Fax #
- ☑ Sampler Name
- ☐ Courier Signature/Date/Time
- ☐ TAT
- ☑ Sample ID
- ☑ Sampling Date/Time/Location
- ☑ Analysis Required
- ☐ Matrix
- ☐ Preservative (if any)
- ☐ Superfund Site Samples

Safety Issues ☑ None ☐ High Concentrations expected ☐ Rad Screening Required

Comments:

Packaging Inspection

Container	☑ Cooler	☐ Box	☐	☐
Condition	☐ Custody Seal	☑ Intact	☐ Damaged	☐
Packaging	☐ Bubble Pack	☐ Styrofoam	☑ Sufficient	☐
Temperatures	☑ Cooler 1 4.5	☑ Cooler 2 ____	☐ Cooler 3 ____	☐ Cooler 4 ____
	☐ Cooler 5 ____	☐ Cooler 6 ____	☐ Cooler 7 ____	☐ Cooler 8 ____
	☐ Cooler 9 ____	☐ Cooler 10 ____	☐ Cooler 11 ____	☐ Cooler 12 ____

Comments:

LSCID	Client ID	Discrepancy	Corrective Action

LSCID Lab Sample Container ID

REVIEWS

Sample Labeling [signature] Date 9/9/05

SRF [signature] Date 9/9/05

PM [signature] Date 9/9/05

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 210620

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

SDG#: 05I068

4000

CASE NARRATIVE

CLIENT: SES-TECH

PROJECT: CAMP PENDLETON, UST SITE 210620

SDG: 05I068

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Eight (8) water samples were received on 09/09/05 for Volatile Aromatics by GC by EPA Method 5030/8021B in accordance with SW846 3rd Edition.

1. **Holding Time**

   Analytical holding time was met. Samples were preserved.

2. **Calibration**

   Initial calibration was six points. %RSDs were within 20%. Continuing calibrations were carried out within 12-hour intervals. Mean recoveries were within 85-115%.

3. **Method Blank**

   Method blank was free of contamination at half of the reporting limit.

4. **Surrogate Recovery**

   Recoveries were within QC limits.

5. **Lab Control Sample/Lab Control Sample Duplicate**

   All recoveries were within QC limits.

6. **Matrix Spike/Matrix Spike Duplicate**

   No MS/MSD sample was designated in this SDG.

7. **Sample Analysis**

   Samples were analyzed according to the prescribed QC procedures. All criteria were met. All positive results above RL were confirmed by GC/FID, for MTBE confirmed by GC/MS.

LAB CHRONICLE
VOLATILE AROMATICS BY GC

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 210620

SDG NO. : 051068
Instrument ID : GCT039

WATER

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	VA39107B	1	NA	09/12/0512:42	09/12/0512:42	EI12004B	EI12003B	VA39107	Method Blank
LCS1W	VA39108L	1	NA	09/12/0514:31	09/12/0514:31	EI12007B	EI12003B	VA39107	Lab Control Sample (LCS)
LCD1W	VA39108C	1	NA	09/12/0515:08	09/12/0515:08	EI12008B	EI12003B	VA39107	LCS Duplicate
MBLK2W	VA39109B	1	NA	09/13/0508:32	09/13/0508:32	EI12037B	EI12027B	VA39109	Method Blank
LCS2W	VA39109L	1	NA	09/13/0509:08	09/13/0509:08	EI12038B	EI12027B	VA39109	Lab Control Sample (LCS)
LCD2W	VA39109C	1	NA	09/13/0509:44	09/13/0509:44	EI12039B	EI12027B	VA39109	LCS Duplicate
0004-40	1068-01	1	NA	09/12/0523:34	09/12/0523:34	EI12022B	EI12013B	VA39107	Field Sample
0004-41	1068-02	1	NA	09/13/0500:10	09/13/0500:10	EI12023B	EI12013B	VA39107	Field Sample
0004-42	1068-03	1	NA	09/13/0503:45	09/13/0503:45	EI12029B	EI12027B	VA39107	Field Sample
0004-43	1068-04	1	NA	09/13/0500:46	09/13/0500:46	EI12024B	EI12013B	VA39107	Field Sample
0004-43DL	1068-04T	2.5	NA	09/13/0519:22	09/13/0519:22	EI12055B	EI12051B	VA39109	Diluted Sample
0004-44	1068-05	1	NA	09/13/0505:33	09/13/0505:33	EI12032B	EI12027B	VA39107	Field Sample
0004-44DL	1068-05T	5	NA	09/13/0512:08	09/13/0512:08	EI12043B	EI12041B	VA39109	Diluted Sample
0004-45	1068-06	1	NA	09/13/0506:09	09/13/0506:09	EI12033B	EI12027B	VA39107	Field Sample
0004-46	1068-07	1	NA	09/13/0506:45	09/13/0506:45	EI12034B	EI12027B	VA39107	Field Sample
0004-47	1068-08	1	NA	09/13/0507:20	09/13/0507:20	EI12035B	EI12027B	VA39107	Field Sample
0004-42MS	1068-03M	1	NA	09/13/0504:21	09/13/0504:21	EI12030B	EI12027B	VA39107	Matrix Spike Sample (MS)
0004-42MSD	1068-03S	1	NA	09/13/0504:57	09/13/0504:57	EI12031B	EI12027B	VA39107	MS Duplicate (MSD)

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	09/08/05
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/09/05
Batch No.	: 051068	Date Extracted:	09/12/05 23:34
Sample ID:	0004-40	Date Analyzed:	09/12/05 23:34
Lab Samp ID:	1068-01	Dilution Factor:	1
Lab File ID:	EI12022B	Matrix :	WATER
Ext Btch ID:	VA39107	% Moisture :	NA
Calib. Ref.:	EI12013B	Instrument ID :	GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	.5	.1
TOLUENE	ND	.5	.1
ETHYLBENZENE	ND	.5	.1
XYLENES	ND	1.5	.3
MTBE	ND	1	.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	116	75-125
1,1,1-TFT	121	75-125

RL: Reporting Limit

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	09/08/05
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/09/05
Batch No.	: 051068	Date Extracted:	09/13/05 00:10
Sample ID:	0004-41	Date Analyzed:	09/13/05 00:10
Lab Samp ID:	1068-02	Dilution Factor:	1
Lab File ID:	EI12023B	Matrix :	WATER
Ext Btch ID:	VA39107	% Moisture :	NA
Calib. Ref.:	EI12013B	Instrument ID :	GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	.5	.1
TOLUENE	ND	.5	.1
ETHYLBENZENE	ND	.5	.1
XYLENES	ND	1.5	.3
MTBE	67	1	.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	117	75-125
1,1,1-TFT	122	75-125

RL: Reporting Limit

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	09/08/05
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/09/05
Batch No.	: 051068	Date Extracted:	09/13/05 03:45
Sample ID:	0004-42	Date Analyzed:	09/13/05 03:45
Lab Samp ID:	1068-03	Dilution Factor:	1
Lab File ID:	E112029B	Matrix	: WATER
Ext Btch ID:	VA39107	% Moisture	: NA
Calib. Ref.:	E112027B	Instrument ID	: GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	.5	.1
TOLUENE	ND	.5	.1
ETHYLBENZENE	ND	.5	.1
XYLENES	ND	1.5	.3
MTBE	21	1	.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	115	75-125
1,1,1-TFT	121	75-125

RL: Reporting Limit

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	09/08/05
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/09/05
Batch No.	: 051068	Date Extracted:	09/13/05 00:46
Sample ID:	0004-43	Date Analyzed:	09/13/05 00:46
Lab Samp ID:	1068-04	Dilution Factor:	1
Lab File ID:	EI12024B	Matrix	: WATER
Ext Btch ID:	VA39107	% Moisture	: NA
Calib. Ref.:	EI12013B	Instrument ID	: GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	.5	.1
TOLUENE	ND	.5	.1
ETHYLBENZENE	ND	.5	.1
XYLENES	ND	1.5	.3
MTBE	240E	1	.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	119	75-125
1,1,1-TFT	123	75-125

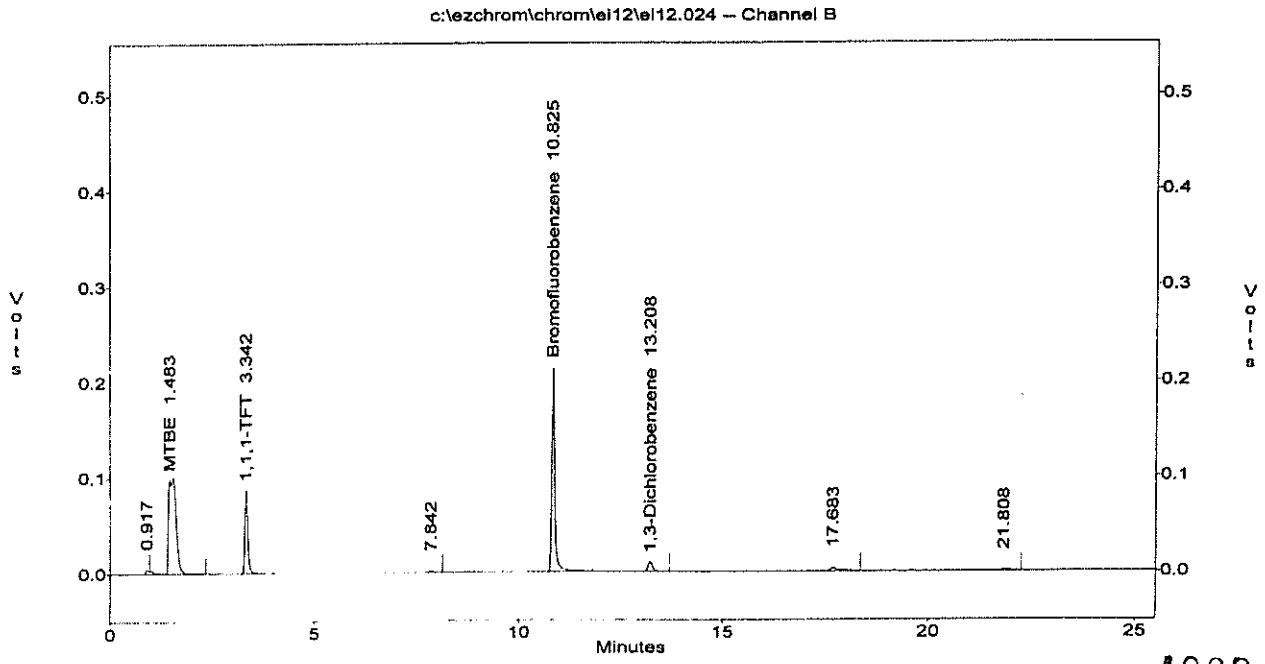
RL: Reporting Limit

METHOD 8021 by PID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\ei12\ei12.024
Method : c:\ezchrom\methods\vg39h03.met
Sample ID : 05I068-04 5.0ML W
Acquired : Sep 13, 2005 00:46:00
Printed : Sep 14, 2005 11:46:47
User : SERGIO

Channel B Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
2	MTBE	1.483	1335788.0	5471.9	244.12 E
--	Benzene	2.375	0.0	0.0	0.00
3	1,1,1-TFT	3.342	458652.0	9297.3	49.33
--	Toluene	5.042	0.0	0.0	0.00
--	Chlorobenzene	8.342	0.0	0.0	0.00
--	Ethylbenzene	8.925	0.0	0.0	0.00
--	M/P-Xylenes	9.192	0.0	0.0	0.00
--	O-Xylene	9.908	0.0	0.0	0.00
5	Bromofluorobenzene	10.825	1107205.0	23296.3	47.53
6	1,3-Dichlorobenzene	13.208	71331.0	23201.4	3.07
--	1,4-Dichlorobenzene	13.333	0.0	0.0	0.00
--	1,2-Dichlorobenzene	13.975	0.0	0.0	0.00



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EMA LABORATORIES

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	09/08/05
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/09/05
Batch No.	: 051068	Date Extracted:	09/13/05 19:22
Sample ID:	0004-43DL	Date Analyzed:	09/13/05 19:22
Lab Samp ID:	1068-04T	Dilution Factor:	2.5
Lab File ID:	EI12055B	Matrix :	WATER
Ext Btch ID:	VA39109	% Moisture :	NA
Calib. Ref.:	EI12051B	Instrument ID :	GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1.2	.25
TOLUENE	ND	1.2	.25
ETHYLBENZENE	ND	1.2	.25
XYLENES	ND	3.7	.75
MTBE	220	2.5	1.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	113	75-125
1,1,1-TFT	118	75-125

RL: Reporting Limit

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	09/08/05
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/09/05
Batch No.	: 051068	Date Extracted:	09/13/05 05:33
Sample ID:	0004-44	Date Analyzed:	09/13/05 05:33
Lab Samp ID:	I068-05	Dilution Factor:	1
Lab File ID:	EI12032B	Matrix :	WATER
Ext Btch ID:	VA39I07	% Moisture :	NA
Calib. Ref.:	EI12027B	Instrument ID :	GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	.5	.1
TOLUENE	ND	.5	.1
ETHYLBENZENE	ND	.5	.1
XYLENES	ND	1.5	.3
MTBE	190E	1	.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	98	75-125
1,1,1-TFT	112	75-125

RL: Reporting Limit

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	09/08/05
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/09/05
Batch No.	: 051068	Date Extracted:	09/13/05 12:08
Sample ID:	0004-44DL	Date Analyzed:	09/13/05 12:08
Lab Samp ID:	1068-05T	Dilution Factor:	5
Lab File ID:	E112043B	Matrix :	WATER
Ext Btch ID:	VA39109	% Moisture :	NA
Calib. Ref.:	E112041B	Instrument ID :	GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	2.5	.5
TOLUENE	ND	2.5	.5
ETHYLBENZENE	ND	2.5	.5
XYLENES	ND	7.5	1.5
MTBE	170	5	2.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	101	75-125
1,1,1-TFT	116	75-125

RL: Reporting Limit

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	09/08/05
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/09/05
Batch No.	: 051068	Date Extracted:	09/13/05 06:09
Sample ID:	0004-45	Date Analyzed:	09/13/05 06:09
Lab Samp ID:	1068-06	Dilution Factor:	1
Lab File ID:	E112033B	Matrix :	WATER
Ext Btch ID:	VA39107	% Moisture :	NA
Calib. Ref.:	E112027B	Instrument ID :	GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	.5	.1
TOLUENE	ND	.5	.1
ETHYLBENZENE	ND	.5	.1
XYLENES	ND	1.5	.3
MTBE	1.4	1	.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	103	75-125
1,1,1-TFT	115	75-125

RL: Reporting Limit

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	09/08/05
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/09/05
Batch No.	: 051068	Date Extracted:	09/13/05 06:45
Sample ID:	0004-46	Date Analyzed:	09/13/05 06:45
Lab Samp ID:	1068-07	Dilution Factor:	1
Lab File ID:	EI12034B	Matrix :	WATER
Ext Btch ID:	VA39107	% Moisture :	NA
Calib. Ref.:	EI12027B	Instrument ID :	GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	.5	.1
TOLUENE	ND	.5	.1
ETHYLBENZENE	ND	.5	.1
XYLENES	ND	1.5	.3
MTBE	3.8	1	.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	105	75-125
1,1,1-TFT	118	75-125

RL: Reporting Limit

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	09/08/05
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/09/05
Batch No.	: 051068	Date Extracted:	09/13/05 07:20
Sample ID:	0004-47	Date Analyzed:	09/13/05 07:20
Lab Samp ID:	1068-08	Dilution Factor:	1
Lab File ID:	EI12035B	Matrix :	WATER
Ext Btch ID:	VA39107	% Moisture :	NA
Calib. Ref.:	EI12027B	Instrument ID :	GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	.5	.1
TOLUENE	ND	.5	.1
ETHYLBENZENE	ND	.5	.1
XYLENES	ND	1.5	.3
MTBE	ND	1	.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	108	75-125
1,1,1-TFT	118	75-125

RL: Reporting Limit

QC SUMMARIES

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	NA
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/12/05
Batch No.	: 051068	Date Extracted:	09/12/05 12:42
Sample ID:	MBLK1W	Date Analyzed:	09/12/05 12:42
Lab Samp ID:	VA39107B	Dilution Factor:	1
Lab File ID:	EI12004B	Matrix :	WATER
Ext Btch ID:	VA39107	% Moisture :	NA
Calib. Ref.:	EI12003B	Instrument ID :	GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	.5	.1
TOLUENE	ND	.5	.1
ETHYLBENZENE	ND	.5	.1
XYLENES	ND	1.5	.3
MTBE	ND	1	.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	102	75-125
1,1,1-TFT	117	75-125

RL: Reporting Limit

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 210620
BATCH NO.: 051068
METHOD: EPA METHOD 5030B/8021B

MATRIX:	WATER			% MOISTURE:	NA
DILUTION FACTOR:	1	1	1		
SAMPLE ID:	MBLK1W				
LAB SAMP ID:	VA39107B	VA39108L	VA39108C		
LAB FILE ID:	E112004B	E112007B	E112008B		
DATE EXTRACTED:	09/12/0512:42	09/12/0514:31	09/12/0515:08	DATE COLLECTED:	NA
DATE ANALYZED:	09/12/0512:42	09/12/0514:31	09/12/0515:08	DATE RECEIVED:	09/12/05
PREP. BATCH:	VA39107	VA39107	VA39107		
CALIB. REF:	E112003B	E112003B	E112003B		

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Benzene	ND	40	42.9	107	40	43.5	109	1	75-125	20
Toluene	ND	40	41.1	103	40	42.1	105	3	75-125	20
Ethylbenzene	ND	40	43.7	109	40	44.9	112	3	75-125	20
Xylenes	ND	120	128	107	120	132	110	3	75-125	20
MTBE	ND	40	38.6	97	40	35.8	90	8	75-125	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
Bromofluorobenzene	40	39.4	98	40	40.7	102	75-125
1,1,1-TFT	40	44.2	110	40	43.9	110	75-125

EPA METHOD 5030B/8021B
VOLATILE AROMATICS BY GC

Client	: SES-TECH	Date Collected:	NA
Project	: CAMP PENDLETON, UST SITE 210620	Date Received:	09/13/05
Batch No.	: 051068	Date Extracted:	09/13/05 08:32
Sample ID:	MBLK2W	Date Analyzed:	09/13/05 08:32
Lab Samp ID:	VA39109B	Dilution Factor:	1
Lab File ID:	EI12037B	Matrix :	WATER
Ext Btch ID:	VA39109	% Moisture :	NA
Calib. Ref.:	EI12027B	Instrument ID :	GCT039

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	.5	.1
TOLUENE	ND	.5	.1
ETHYLBENZENE	ND	.5	.1
XYLENES	ND	1.5	.3
MTBE	ND	1	.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	103	75-125
1,1,1-TFT	115	75-125

RL: Reporting Limit

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 210620
BATCH NO.: 051068
METHOD: EPA METHOD 5030B/8021B

MATRIX:	WATER			% MOISTURE:	NA
DILUTION FACTOR:	1	1	1		
SAMPLE ID:	MBLK2W				
LAB SAMP ID:	VA39109B	VA39109L	VA39109C		
LAB FILE ID:	EI12037B	EI12038B	EI12039B		
DATE EXTRACTED:	09/13/0508:32	09/13/0509:08	09/13/0509:44	DATE COLLECTED:	NA
DATE ANALYZED:	09/13/0508:32	09/13/0509:08	09/13/0509:44	DATE RECEIVED:	09/13/05
PREP. BATCH:	VA39109	VA39109	VA39109		
CALIB. REF:	EI12027B	EI12027B	EI12027B		

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Benzene	ND	40	39.2	98	40	46.6	117	17	75-125	20
Toluene	ND	40	38.8	97	40	45.5	114	16	75-125	20
Ethylbenzene	ND	40	41.8	104	40	48.6	122	15	75-125	20
Xylenes	ND	120	123	102	120	141	117	14	75-125	20
MTBE	ND	40	32.1	80	40	34.4	86	7	75-125	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
Bromofluorobenzene	40	37.3	93	40	41.1	103	75-125
1,1,1-TFT	40	40.6	102	40	49.6	124	75-125

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 210620
BATCH NO.: 051068
METHOD: EPA METHOD 5030B/8021B

MATRIX:	WATER			% MOISTURE:	NA
DILUTION FACTOR:	1	1	1		
SAMPLE ID:	0004-42				
LAB SAMP ID:	I068-03	I068-03M	I068-03S		
LAB FILE ID:	EI12029B	EI12030B	EI12031B		
DATE EXTRACTED:	09/13/0503:45	09/13/0504:21	09/13/0504:57	DATE COLLECTED:	09/08/05
DATE ANALYZED:	09/13/0503:45	09/13/0504:21	09/13/0504:57	DATE RECEIVED:	09/09/05
PREP. BATCH:	VA39I07	VA39I07	VA39I07		
CALIB. REF:	EI12027B	EI12027B	EI12027B		

ACCESSION:

PARAMETER	SMPL RSLT (ug/L)	SPIKE AMT (ug/L)	MS RSLT (ug/L)	MS % REC	SPIKE AMT (ug/L)	MSD RSLT (ug/L)	MSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Benzene	ND	40	43.7	109	40	44.2	111	1	75-125	20
Toluene	ND	40	42	105	40	42.6	106	1	75-125	20
Ethylbenzene	ND	40	44.5	111	40	45	113	1	75-125	20
Xylenes	ND	120	132	110	120	134	111	1	75-125	20
MTBE	21.4	40	62.8	104	40	62.7	103	0	75-125	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	MS RSLT (ug/L)	MS % REC	SPIKE AMT (ug/L)	MSD RSLT (ug/L)	MSD % REC	QC LIMIT (%)
Bromofluorobenzene	40	43	107	40	43.6	109	75-125
1,1,1-TFT	40	43.4	109	40	43.9	110	75-125