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TRANSMITTAL LETTER

Date: May 4, 1998
Re: Investigation Report, May 1998

To: Mr. Larry Seto
Senior Hazardous Materials Specialist
Alameda County Department of Environmental Health
Environmental Protection Division
1131 Harbor Bay Parkway, #250
Alameda, CA 94502-6577

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1	Continued Soil and Groundwater Investigation Report Alameda Federal Center, 620 Central Avenue, Alameda, CA, **STID 4655**, May 4, 1998

REMARKS

From: Bill Millar
Job #: 2403C.024.001

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Continued Soil and Groundwater Investigation Report

Alameda Federal Center
620 Central Avenue
Alameda, California

STID 4655
CAPE Project No. 2403C.024.001

prepared for:

General Services Administration, Region 9
450 Golden Gate Avenue
San Francisco, California 94025

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prepared by:

Cape Environmental Management Inc
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May 1998

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APPENDICES

1.0 INTRODUCTION

On behalf of General Services Administration (GSA), Cape Environmental Management Inc (CAPE) has performed this Continued Soil and Groundwater Investigation of the Alameda Federal Center, located at 620 Central Avenue, Alameda, California. The purpose of the continued investigation is to monitor the extent of soil and ground water contamination due to underground storage tank (UST) releases following the removal of UST's 3 and 4 from the site. Figure 1, Site Vicinity Map, depicts the vicinity of the subject site.

1.1 Site Description

The site is located in the northwest portion of the City of Alameda, approximately 500 feet east of the San Francisco Bay shoreline, and is situated in a relatively flat tidal plain area, which slopes gently towards the bay. The site covers an approximate area of 10 acres and with several buildings used for administrative office and storage functions. The location and orientation of the subject site is illustrated in Figure 2 - Site Map.

1.2 Previous Site Investigations

Previously, CAPE has submitted to the Alameda County Department of Environmental Health (DEH) a *Preliminary Site Assessment (PSA) Report* (July 1995), *Second-Quarter Groundwater Monitoring Report* (August 1995), *Third-Quarter Groundwater Monitoring Report* (December 1995), *Fourth-Quarter Groundwater Monitoring Report* (March 1996), and another *Groundwater Monitoring Report* dated July 1996. Prior to beginning this phase of the investigation, CAPE submitted to the DEH, and DEH approved, the *Continued Soil and Groundwater Investigation Work Plan* (December 1997).

There were a number of monitoring wells installed during and after the removals of Tanks 1 & 2. Figures 3 and 4 illustrate the locations of the groundwater monitoring wells. According to the quarterly reports of July 1996, groundwater concentrations of volatile organic halocarbons (VOHs) in MW-1 were reported to be 22 micrograms per liter (µg/L) of cis-1, 2-dichloroethene and 5.0 µg/L of trans-1, 2-dichloroethene. Analytical results of MW-1 samples for benzene, toluene, ethylbenzene, and total xylene (BTEX) were less than the detection limit of the method used (ND). Concentrations of hydrocarbon oil and grease (O & G), diesel range organics (DRO), and polynuclear aromatics hydrocarbons (PAHs) were reported as ND. Gasoline range organics (GRO) were also undetectable in samples from wells MW-5 and MW-6. Wells MW-2R and MW-4 were reported to be ND for the above analytes in the second and third quarters. Consequently, discontinuation of monitoring of all previously existing wells, except for MW-1, was recommended by CAPE and approved by DEH in August 1996.

2.0 PROJECT DESCRIPTION

This section describes details of the field and laboratory activities proposed in the work plan, including general drilling techniques, soil sampling, groundwater monitoring well installation, soil and water sample handling, and laboratory testing methodologies. Fieldwork was conducted February 16 - 18, 1998.

2.1 Soil Investigation

A detailed subsurface investigation was performed, consisting of drilling activities for soil test borings, monitoring well installations, soil sampling, and laboratory analysis. Four (4) soil borings were drilled and three (3) of those borings were converted to permanent monitoring wells. Soil samples were taken and, following field screening, selected samples were laboratory tested for various organic constituents.

2.1.1 Drilling Method

Gregg Drilling and Testing, Inc. of Martinez, California performed the drilling services. Prior to drilling activities, a drilling permit (Permit # 98WR040) was obtained from the Alameda County Public Works, Water Resources Section. The drilling permit is included as Appendix A.

In the area of tank 3 and 4, field work was comprised of advancing four (4) soil borings, AB-1, AMW-1, AMW-2, and AMW-3, adjacent to the tank pit to a depth of fifteen (15) feet below ground surface (bgs). Soil samples were taken at intervals of five (5) feet, including samples at the soil/water interface and at any change in lithology, to assess soil conditions. Soil and geologic descriptions of the borings are included in the boring logs and are presented as Appendix B. All field activities were conducted in accordance with the procedures outlined in the Health and Safety Plan (December 1997).

Soil borings completed during the present investigation were advanced using a truck-mounted Mobile B-61 drill rig with an 8-inch outside diameter continuous flight hollow-stem auger. Following soil sample collection, AB-1 was sealed with Type I-II Portland neat cement concrete from total depth to surface and AMW-1, AMW-2, and AMW-3 were completed as monitoring wells.

Drilling spoils generated from the test borings were temporarily stored on-site in DOT-approved 55-gallon sealed steel drums. Soil sample chemical test results will be used to evaluate the appropriate disposal method(s) for the spoils material. Following transport and disposal of the drilling spoils, manifests will be forwarded to the DEH.

Soil samples were collected in 2-inch diameter brass sample sleeves contained in an 18 inch-long California-modified split-spoon drive sampler advanced below the lead auger by repeated blows of a 140-pound drop hammer It should be noted that, as a result of a rig malfunction, there were no recorded blow counts and no reliable drop distances for boring AB-1.

Samples were collected at five, ten, and fifteen-foot depth intervals for logging and initial screening. Observations of physical characteristics of the soil were logged and described according to the Unified Soil Classification System (USCS) and other appropriate descriptors. Indicated on the boring logs are the drilling methods utilized at each test boring location, total depth of each boring, monitoring well construction details, and other relevant information.

Appropriate decontamination procedures were followed for all soil collection and handling activities to assure that the samples were representative and to avoid sample contamination and formation cross-contamination. Specifically, all drill augers were cleaned using a high-pressure steam cleaner prior to contacting the formation, and all drive sampler components were thoroughly decontaminated by brushing and agitation in Alconox laboratory detergent solution followed by triple-rinsing in tap water obtained from an on-site drinking water source.

2.1.2 Screening Method

All soil samples were screened by ambient temperature headspace (ATH) method for indications of hydrocarbon contamination. The ATH method involves placing approximately five cubic inches of soil into a sealed plastic bag and allowing the soil temperature to equilibrate for approximately fifteen minutes under ambient air temperature conditions. At that time, the probe of a portable photo-ionization detector (PID), calibrated with 100 ppm isobutylene, was inserted into the bag headspace and the reading recorded. Samples of material exhibiting a PID response and other potential indications of contamination were selected for laboratory analysis.

2.2 Groundwater Investigation

2.2.1 Monitoring Well Installation

Three of the four soil borings, AMW-1, AMW-2, and AMW-3, were converted to monitoring wells by installation of nominal 2-inch diameter schedule 40 PVC casing and screen. The screen slot was 0.010-inch mill-slot. The annulus of each well was filled with Monterey #3 graded and washed high-silica sand from total depth to approximately one foot above the upper screened section. A one-foot sanitary seal of hydrated bentonite chips was placed above the filter pack sand, the remainder of the annulus was filled with Volclay grout. The well head is protected by a traffic rated well cover set in concrete. All wells were finished with locking well caps and completed in accordance with CAPE's standard operating procedures, California State Water Resources Control Board and Department of Water Resources procedures, as well as other applicable protocols. Refer to Appendix C for monitoring well completion information. Figures 3 and 4 depict the locations of all test and monitoring well borings.

2.2.2 Well Development, Purging and Sampling

CAPE personnel supervised Gregg Drilling and Testing, Inc. in the development of the groundwater monitoring wells. The purpose of well development was to consolidate the sand filter pack around the screened interval of the casing and to remove silty sediments from within the well water. Sounding was performed on the monitoring wells in the tank 3 and 4 area

(AMW-1, AMW-2, and AMW-3) with the aid of an electronic water level indicator. Field work in tank areas 1 and 2 included sounding the existing monitoring wells MW-1, MW-4, MW-5, and MW-6. Well MW-2 was inaccessible during the investigation due to a parked vehicle over the well cap and, thus, was not sounded. Following sounding, AMW-1, AMW-2, and AMW-3 were surged with a vented surge block for approximately twenty minutes. Then the wells were bailed with an eight-foot long stainless steel bailer and a two-inch diameter Grunfos® pump. Approximately fifty-five gallons of water were bailed and pumped from the well during development. On the following day, all wells except MW-2 were sounded. MW-1, AMW-1, AMW-2, and AMW-3 were each purged of three well volumes. Following purging, groundwater samples were collected from each of the four wells. Refer to the Groundwater Purging and Sampling Logs (Appendix D) for additional information.

2.3 Sampling

2.3.1 Preparation and Handling

Selected soil samples were sealed with Teflon® sheets and capped. Soil and groundwater samples were then labeled, placed in a pre-cooled ice chest for preservation at 4° Celsius, and transferred under chain-of-custody documentation to a state-certified hazardous waste analytical laboratory. All holding times, sample preservation, and other protocols were observed during sample collection, handling, and transportation.

2.3.2 Laboratory Testing

Soil and groundwater samples were picked up from the site by the VOC Analytical Laboratories (VOC's) personnel from their Concord, California field office. As part of VOC's standard operating procedures, the samples were transferred under chain of custody to VOC's facility in Glendale, California. VOC is a California Department of Health Services-certified hazardous waste analytical laboratory. VOC performed chemical analyses of the selected soil and groundwater samples. Laboratory analyses consisted of the following U.S. EPA-approved procedures:

- Hydrocarbon Oil and Grease (O&G) using Test Method SMWW 5520;
- Diesel Range Organics (DRO) using DHS/LUFT procedure EPA Test Method 8015-Modified (diesel fuel);
- Gasoline Range Organics (GRO) using DHS/LUFT procedure EPA Test Method 8015-Modified (gasoline);
- Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX) using EPA Test Method 8020;
- Volatile Organic Halocarbons (VOH) for EPA Test Method 8010, and

- Polynuclear Aromatic Hydrocarbons (PAH) using EPA Test Method 8270.

A total of nine (9) soil samples were collected from the four (4) test borings excavated for this investigation. A total of four (4) groundwater samples were collected from the wells being monitored. Appendix E, Laboratory Analyses and Chain-of-Custody Record, shows the selected samples and the results of the testing.

During the analysis of the soil and groundwater samples VOC closed their facilities in Glendale and Concord, California. The samples had been extracted and analysis had begun. As part of the laboratory closure the soil and groundwater samples were transferred to VOC's laboratory in Boca Raton, Florida. The analyses and laboratory report were completed in the Florida facility. As a result of the laboratory closure and the transfer of the samples in mid analysis, and some confusion on the part of the laboratory, the oil and grease analysis on the soil samples were run outside of the holding times, and the water samples were not analyzed for oil and grease. We will have the groundwater samples analyzed for oil and grease on subsequent rounds of quarterly groundwater monitoring.

3.0 RESULTS AND FINDINGS

This section describes the results of the monitoring and sampling with respect to identified contaminant concentrations and distribution in soils and groundwater in the areas investigated.

3.1 Soil Investigation Results

A summary of laboratory chemical test results for soil samples is provided on Table 3.1.1. No samples were collected from AMW-1. The California split spoon sampler used did not recover samples of the loose gravel fill used in the UST excavation. As indicated on the table, soil samples from three of the four soil borings in the tank 3 and 4 area, AB-1, AMW-2, and AMW-3, were tested. Results for the oil and grease analysis of the soil samples reported indicate that low concentrations of oil and grease ranging from ND to 530 milligrams per kilogram (mg/kg) were detected in the soil samples analyzed.

Detectable levels of total diesel range organics (DRO) were reported for the soil samples ranging from ND to 21 mg/kg. For AB-1 and AMW-2, DRO concentrations were highest at five feet below ground surface (bgs). For AMW-3 samples DRO concentrations were similar at the five and ten feet bgs, both of which exceed the concentrations noted at the same depths in AB-1 and AMW-2. The soil samples collected at fifteen-feet bgs showed no detectable levels of DRO.

Gasoline range organics (GRO, detection limit (DL) = 1 mg/kg) and benzene, toluene, ethylbenzene and total xylene (BTEX, DL = 5 micrograms per kilogram (µg/kg)) were not detected in soil samples from this area

The soil samples were analyzed for polynuclear aromatic hydrocarbons (PAH), Pyrene was detected in sample AMW-3-10' at a concentration of 0.27 mg/kg. No other PAH's were detected in the soil samples analyzed.

The soil samples were also analyzed for volatile organic halocarbons (VOH). No VOH's were detected in the soil samples analyzed.

3.2 Groundwater Investigation Results

Laboratory test results for groundwater samples collected are summarized in Tables 3.2.1 and 3.2.2. A summary of the groundwater sample analytical data for the samples collected from MW-1 since May 18, 1995 is included as Table 3.2.3. Groundwater samples were collected from monitoring wells MW-1, AMW-1, AMW-2, and AMW-3, and were analyzed for the following parameters: DRO, GRO, BTEX, PAH and VOHs. VOH's and DRO were detected in groundwater sample MW-1. VOH's tetrachloroethene and cis-1, 2-dichloroethene were detected at 2.1 µg/L and 5.6 µg/L, respectively. Tetrachloroethene had not been detected in the four previous groundwater samples collected from MW-1. The last detected concentration of tetrachloroethene was 1 µg/L in the sample collected on May 18, 1995. The concentration of cis-1,2-dichloroethene has decreased from 22 µg/L detected in the sample from July 1996. Concentrations of DRO, have notably decreased in MW-1 samples, from 5,500 µg/L in July of 1996 to 360 µg/L in February 1998. Concentrations of GRO and BTEX were ND for MW-1.

For wells AMW-1, AMW-2, and AMW-3, concentrations of PAHs were not found at or above the detection limits. DRO levels for AMW-1, AMW-2, and AMW-3 were found to be 150 µg/L, 380 µg/L and 17,000 µg/L, respectively. No GRO was detected in AMW-1 and AMW-2 samples. The sample from AMW-3 was reported to contain a concentration of 140 µg/L GRO. AMW-2 was found to have a benzene concentration of 0.99 µg/L, a figure nearing the maximum contamination level (MCL) of 1µg/L, whereas AMW-1 and AMW-3 were ND. Samples from AMW-1, AMW-2, and AMW-3 were analyzed for toluene, ethylbenzene and xylenes but no detectable concentrations were reported.

3.3 Groundwater Gradient Determination

A relative elevation and location survey was conducted on May 18, 1995 encompassing the Tank 1 and 2 and Tank 3 and 4 Areas. The new groundwater monitoring wells were added to the survey on February 17, 1998. The surveys were performed by Ron Archer, Civil Engineer, Inc., a California-Registered Professional Engineer. Survey data is included as Appendix F. Survey graphics used in determining groundwater gradient are provided on Figure 5, Groundwater Gradient Map, and monitoring well reference point locations are tabulated in Table 3.3.1, Static Water Level (SWL) Measurements. All elevations determined for this study are reduced to mean sea level datum. Survey locations are relative to established permanent landmarks (e.g building corners, street curbs, etc.)

Groundwater gradient for the study area was estimated by concurrent sounding of all but one of the monitoring points, and the elevations at each well were previously determined. Depth to static groundwater from each reference point was then reduced to mean sea level elevations and the data points were contoured

From the given information, groundwater was found to be flowing towards the bay in a south-western direction from the tank 1 and 2 area. Moving to the east across the site the groundwater flow changes to a northerly direction. Groundwater gradient changes again, flowing north-west, away from the bay in the tank 3 and 4 area. It is expected that seasonal, annual, and opportunistic fluctuation in water level and corresponding alterations of the current groundwater flow regime (gradient and direction) may occur in response to local precipitation, landscape irrigation, urban runoff, tidal influences and other factors.

It is suspected that a tidal effect, subsurface obstruction, active dewatering pumps or a combination of these effects may have resulted in the indicated gradient flowing away from the San Francisco bay and toward the land in the tank 3 & 4 area. Subsequent quarterly monitoring will provide additional data on groundwater gradient fluctuations.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This Section presents a summary of conclusions and recommendations derived from activities of the current site assessment. This Section concludes with recommendations for further action.

4.1 CONCLUSIONS

Tank 1 and 2 Area

- MW-1 groundwater samples contained DRO and VOH's. DRO concentrations were reported at 0.36 milligrams per liter (mg/L) up from the ND reported in July 1996. The source of the DRO detected in the sample from MW-1 is probably former Tank 1.

  VOH's tetrachloroethene (PCE) and cis-1,2-dichloroethene were detected in the water sample from MW-1. Tetrachloroethene was reported at 2.1 µg/L, below the MCL. Tetrachloroethene had not been reported in the previous four groundwater samples collected from MW-1. The sample collected from May 18, 1995 was reported to contain 1.0 µg/L tetrachloroethene. Cis-1,2-dichloroethene was reported at 5.6 µg/L , below the MCL, down from 22 µg/L reported in the July 1996 sample. Tetrachloroethene and cis-1,2-dichloroethene are used as or are associated with degreasing metals and solvents. The presence of these compounds is consistent with chlorinated solvents or degreasers, possibly originating at former Tank 1.

  Chlorinated solvents and degreasers may have been used in association with vehicle maintenance at the facility, but no records of storage or disposal of these chemicals in the USTs on site is available. It is possible that there is an off site source of the VOH's detected in the groundwater sample from well MW-1.

Tank 3 and 4 Area

- Results of laboratory analyses for all soil samples submitted from the four test borings drilled in this area for the present investigation were none detected for GRO, VOH's, and BTEX compounds.

- Oil and grease range hydrocarbons were detected in several of the soil samples submitted for analysis, see Table 3.1.1. The oil and grease range hydrocarbons may be present as the result of degradation of fuel oil and/or diesel, which may have leaked from USTs 3 & 4.

- Diesel range hydrocarbons were detected in most of the soil samples submitted for analysis, see Table 3.1.1. The presence of these hydrocarbons in the soil may be consistent with a leak of diesel from USTs 3 & 4.

- Pyrene was detected at 0.27 mg/kg in soil sample AMW-3-10'. No other PAH's were detected in the soil samples submitted for analysis. The presence of pyrene in the soil may be consistent with a fuel oil and/or diesel leak from the USTs in the area.

- DRO was detected in groundwater samples from AMW-1, AMW-2, and AMW-3 at 150 µg/L, 380 µg/L, and 17,000 µg/L, respectively. A sheen was visible on the water from wells AMW-2 and AMW-3. Diesel range hydrocarbons, which may have leaked from the now removed USTs 3 & 4, were detected in groundwater samples from the wells near the former tank locations.

- GRO was detected at 140 µg/L in the groundwater sample collected from AMW-3. No GRO was detected in groundwater samples from AMW-1 and AMW-2. Gasoline range hydrocarbons were detected in the groundwater sample from the "upgradient" well in the Tank 3 & 4 area. The source of the GRO may be former USTs 3 & 4.

- Benzene was detected at 0.99 µg/L, near the MCL, in the groundwater sample collected from AMW-2. BTEX compounds were not detected in the groundwater samples from AMW-1 and AMW-3. Toluene, ethyl benzene, and xylenes were not detected in the sample from AMW-2. The presence of benzene is inconsistent with the known contents of USTs 3 & 4, now removed from the area. However, benzene has been detected at sites with diesel leaks.

- No PAH's were detected in the groundwater samples collected.

4.2 RECOMMENDATIONS

- Continue to monitor groundwater wells MW-1, AMW-1, AMW-2, and AMW-3 for three (3) additional quarters. The next quarterly monitoring should take place in May. Analyze the groundwater samples for oil and grease, diesel, gasoline, BTEX compounds and volatile organic halocarbons

- CAPE recommends that analysis of groundwater samples for PAH's be discontinued based on the results of this round of monitoring.

- Continue to collect well sounding data and prepare groundwater contour and gradient estimates for the site in future quarters of monitoring to evaluate gradient directions and fluctuations in gradient over time under different seasonal and tidal conditions. o.k.

TABLES

TABLE 3.1.1
SUMMARY OF ANALYSTICAL RESULTS (SOIL)
PETROLEUM COMPOUNDS

SAMPLE	DATE	Oil/Grease (mg/kg)	DRO (mg/kg)	PAH (mg/kg)
AB-1-5'	2/16/98	ND	15	ND
AB-1-10'	2/16/98	15	5.1	ND
AB-1-15'	2/16/98	ND	6.9	ND
AMW-2-5'	2/16/98	350	12	ND
AMW-2-10'	2/16/98	310	4.7	ND
AMW-2-15'	2/16/98	400	7.1	ND
AMW-3-5'	2/16/98	530	20	ND
AMW-3-10'	2/16/98	160	21	0.27 pyrene
AMW-3-15'	2/18/98	ND	ND	ND

Abbreviations:

Oil/Grease	=	hydrocarbon oil and grease (DL = 10 mg/kg)
DRO	=	Diesel range organics (DL = 1 mg/kg)
-mg/L	=	milligrams per liter
-µg/L	=	micrograms per liter
ND	=	not detected at or above the defined detection limit (DL)

PAH Polynuclear aromatic hydrocarbons

Note:
No detectable levels of GRO or BTEX were found to be present in the samples.

TABLE 3.2.1
SUMMARY OF ANALYTICAL RESULTS (WATER)
HALOCARBON & POLYNULCEAR AROMATIC COMPOUNDS

SAMPLE	DATE	VOH's	µg/L
MW-1	2/18/98	Tetrachloroethene cis-1, 2-dichloroethene	2.1 5.6
AMW-1	2/16/98	ND	
AMW-2	2/18/98	ND	
AMW-3	2/18/98	ND	

Abbreviations:
µg/L = Micrograms per liter
ND = not detected at or above the method detection limit (MDL)

TABLE 3.2.2
SUMMARY OF ANALYTICAL RESULTS (WATER)
PETROLEUM COMPOUNDS

SAMPLE	DATE	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)
MW-1	2/16/98	360	ND	ND
AMW-1	2/16/98	150	ND	ND
AMW-2	2/16/98	380	ND	0.99
AMW-3	2/18/98	17000	140	ND

Abbreviations:
DRO = Diesel range organics (MDL = 50 µg/L)
GRO = Gasoline range organics (MDL = 50 µg/L)
µg/L = Micrograms per liter
ND = not detected at or above the method detection limit (MDL)

Note:
No detectable levels of toluene, ethylbenzene, and xylene were found to be present in the samples.

Table 3.2.3

Summary of Water Sample Analytical Results
Alameda Federal Center, Groundwater Monitoring Well MW-1

Collection Date	5/18/95	8/31/95	10/5/95	12/8/95	3/8/96	7/5/96	2/18/98
Compound							
O&G (mg/l) (SMWW 5520)	ND	ND	NA	ND	16	ND	NA
DRO (µg/l) (DOHS 8015 mod.)	5,500d	840d 1,400mo	NA	49d	13,000d	ND*	360
GRO (µg/l) (DOHS 8015 mod.)	ND	NA	ND	NA	NA	NA	ND
Benzene (µg/l)(EPA 8020)	1.1	NA	ND	ND	ND	ND	ND
Toluene (µg/l)(EPA 8020)	ND	NA	ND	ND	ND	ND	ND
Ethyl benzene (µg/l) (EPA 8020)	0.9	NA	ND	ND	ND	ND	ND
Total xylenes (µg/l) (EPA 8020)	1.6	NA	ND	ND	ND	ND	ND
TDS (mg/l) (EPA 160.1)	NA	410	NA	NA	NA	NA	NA
Volatile Halocarbons (EPA 8010)							
Cis-1,2-dichloroethene (µg/l)	3	NA	7.4	5.7	1	22	5.6
Trans-1,2-dichloroethene (µg/l)	3	NA	3.4	2.1	ND	5.0	ND
Trichloroethene (µg/l)	7	NA	1.3	ND	ND	ND	ND
Tetra-chloroethene (µg/l)	1	NA	ND	ND	ND	ND	2.1
Chloroform (µg/l)	1	NA	ND	ND	ND	ND	ND

Abbreviations:

O&G = Oil & Grease
DRO = Diesel range organics
GRO = Gasoline range organics
mg/l = Milligrams per liter
µg/l = Micrograms per liter
NA = Not analyzed
ND = not detected at or above the method detection limit (MDL)
* = DRO analysis for diesel (C12-C22) using silica gel cleanup

TABLE 3.3.1
STATIC WATER LEVEL (SWL) MEASUREMENTS

LOCATION	DATE	TIME	SWL (ft)	CASING ELEVATION (ft)	WATER ELEVATION (ft)
MW-1	2/18/98	0755	2.82	8.19	5.37
MW-4	2/18/98	0739	3.19	8.53	5.34
MW-5	2/18/98	0749	2.78	8.37	5.59
MW-6	2/18/98	0743	3.14	8.61	5.47
AMW-1	2/18/98	0810	3.48	8.73	5.25
AMW-2	2/18/98	0805	3.60	8.84	5.24
AMW-3	2/18/98	0807	3.28	8.53	5.25

Abbreviations:
ft = Feet

FIGURES

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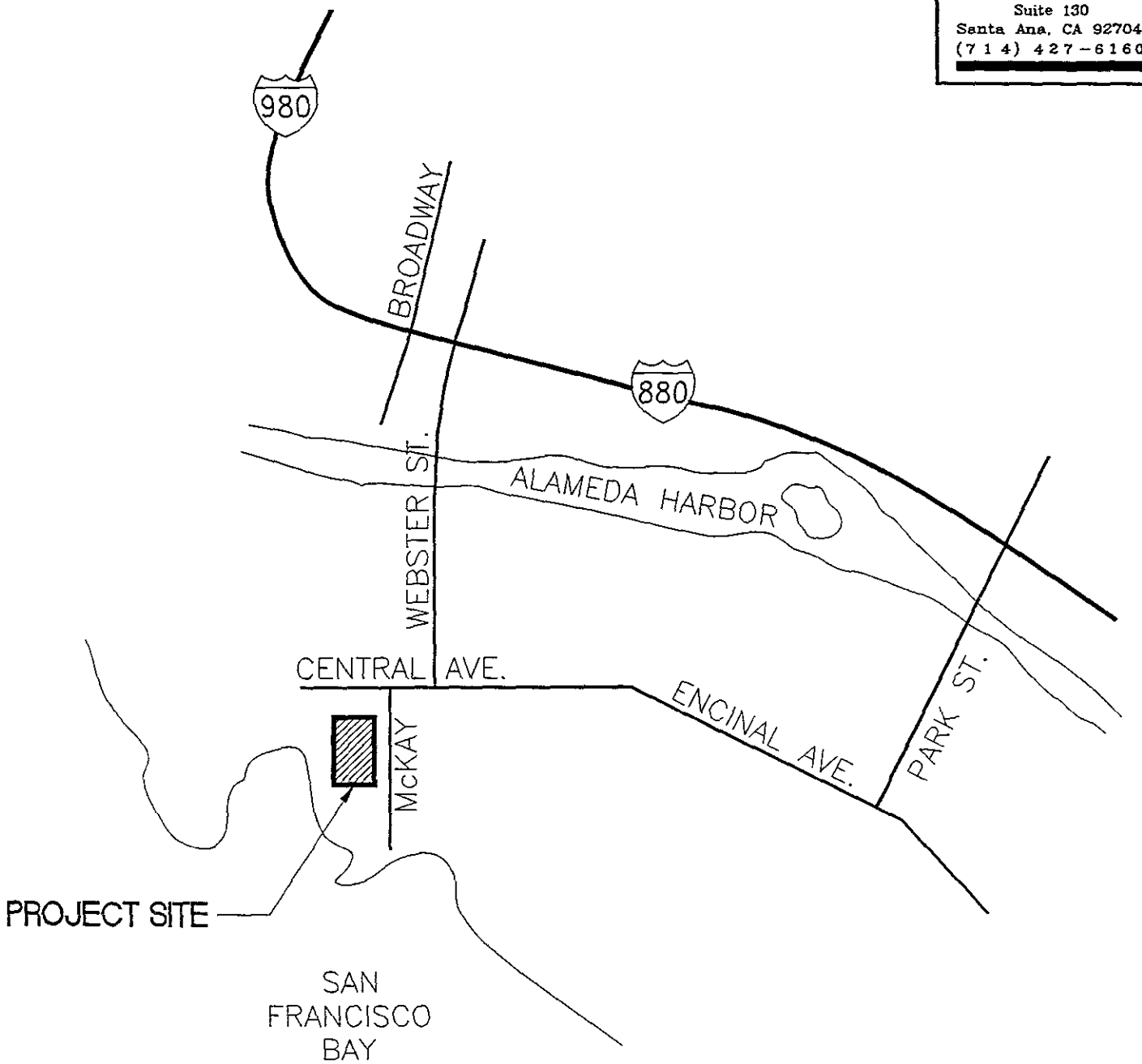

VICINITY MAP

NOT TO SCALE

PROJECT NORTH

SHEET TITLE	CHECKED BY	PROJECT NUMBER
FIGURE 1 - SITE VICINITY MAP	W N M	24030 24

PROJECT TITLE	DRAWN BY	DATE	SHEET
ALAMEDA FEDERAL CENTER, ALAMEDA, CA	G R F	NOV 1997	1 OF 5

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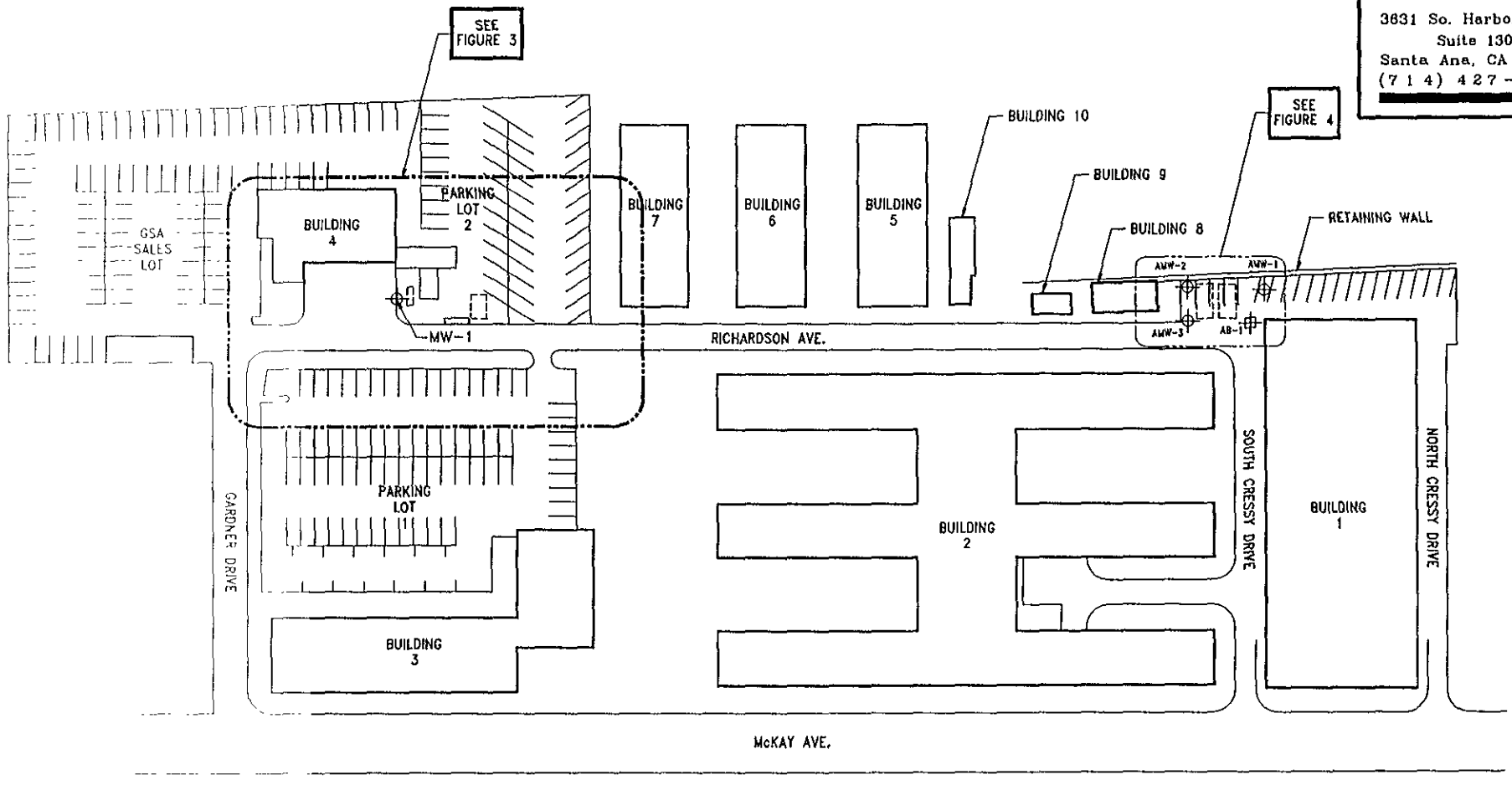

LEGEND

MW-1 MONITORING WELL

AB 1 SOIL BORING

GRAPHIC SCALE

0 10 50 100' 150'

SCALE 1" = 100'

PROJECT NORTH

SHEET TITLE: FIGURE 2 - SITE MAP	CHECKED BY: W.W.M.	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G.R.F.	DATE: MAR. 1998	SHEET: 2 OF 4

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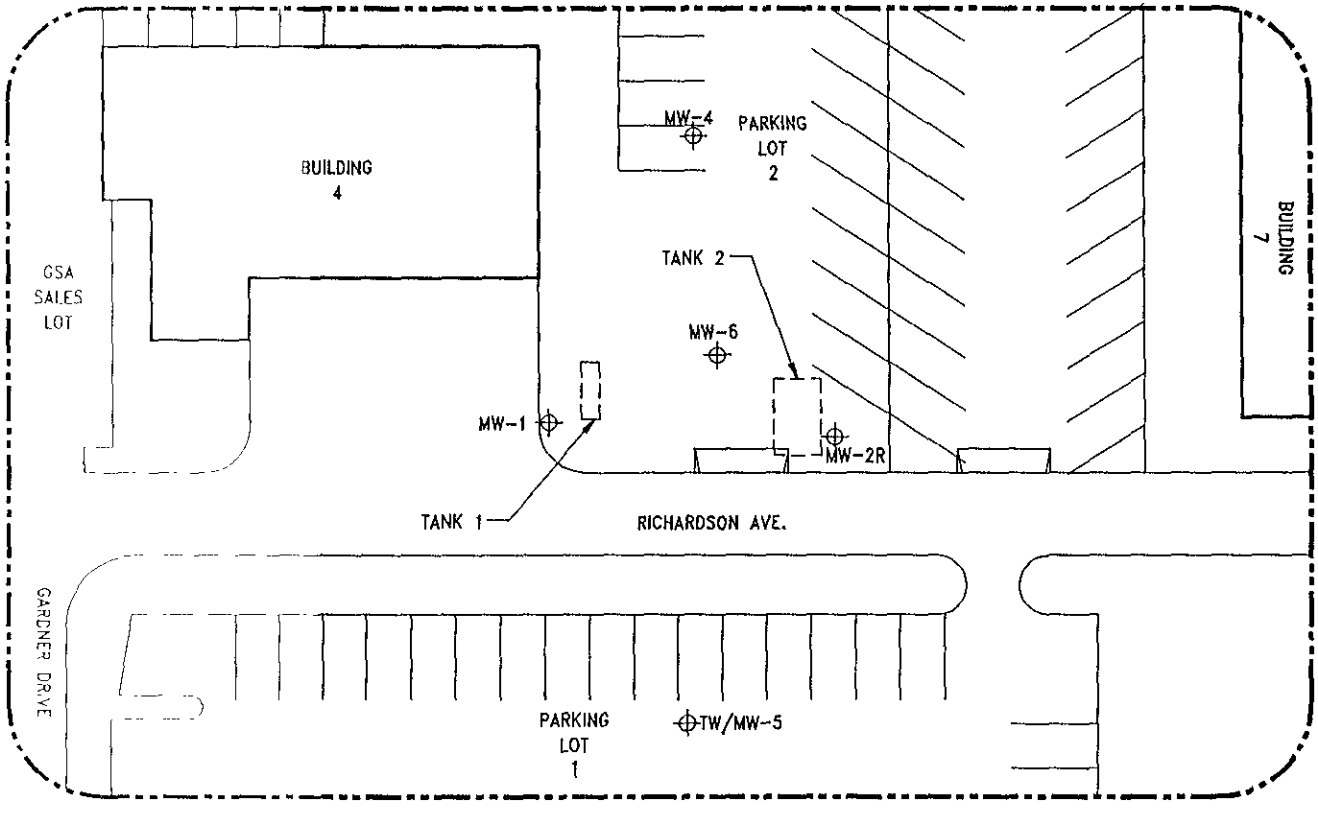


LEGEND

⊕ MW — EXISTING MONITORING WELL

- - - - APPROX. LOCATION OF REMOVED UST's

GRAPHIC SCALE

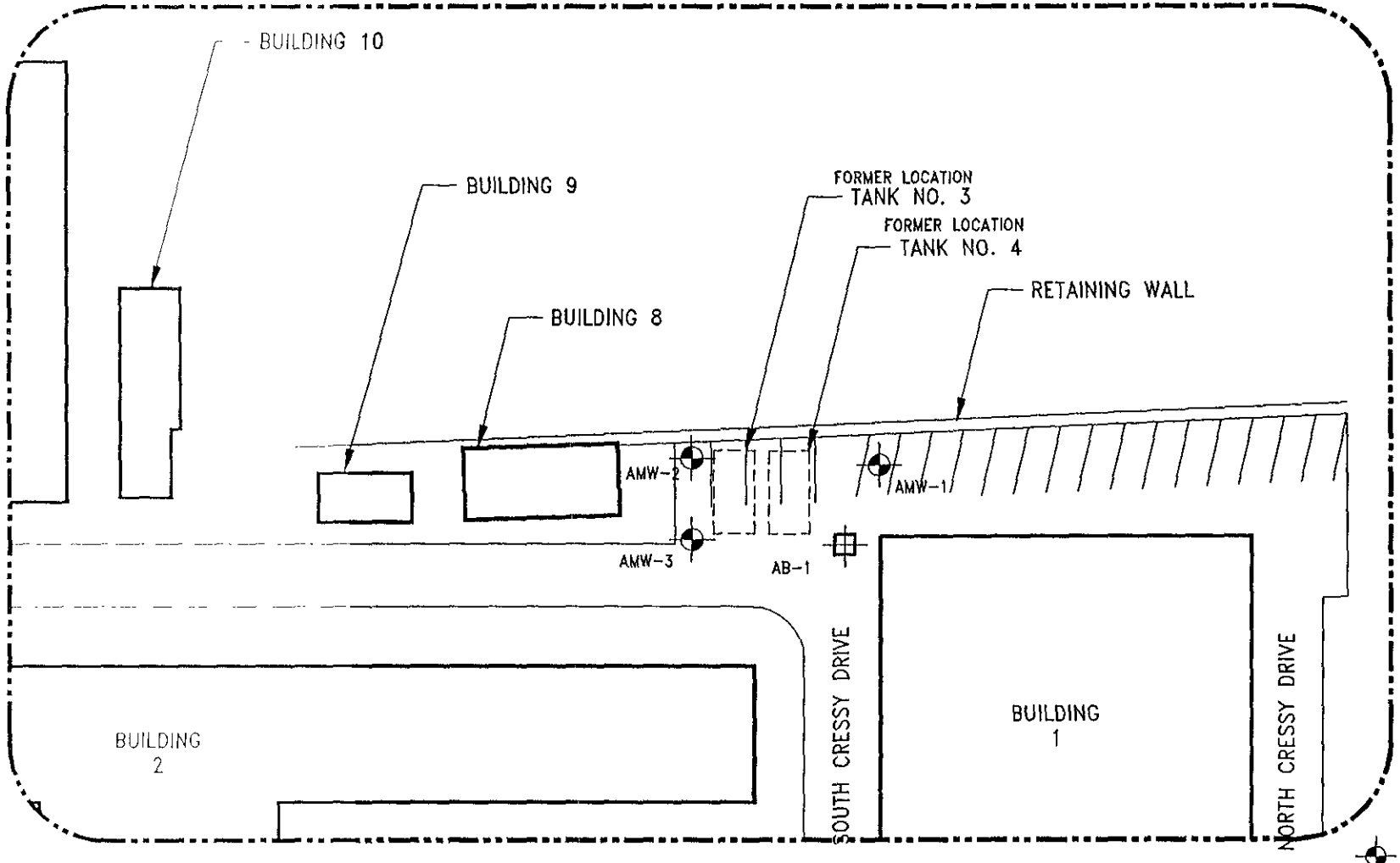
0 10 20 30 40

SCALE: 1" = 40'

PROJECT NORTH

SHEET TITLE: FIGURE 3 – TANK 1 & 2 AREA / MONITORING WELL LOCATIONS	CHECKED BY: W.W.M.	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G.R.F.	DATE: MAR. 1998	SHEET: 3 OF 4

C A P E
ENVIRONMENTAL
MANAGEMENT
I N C
3631 So. Harbor Blvd.
Suite 130
Santa Ana, CA 92704
(714) 427-8180



LEGEND

MONITORING WELLS

SOIL BORING

APPROX. LOCATION OF REMOVED UST's

GRAPHIC SCALE

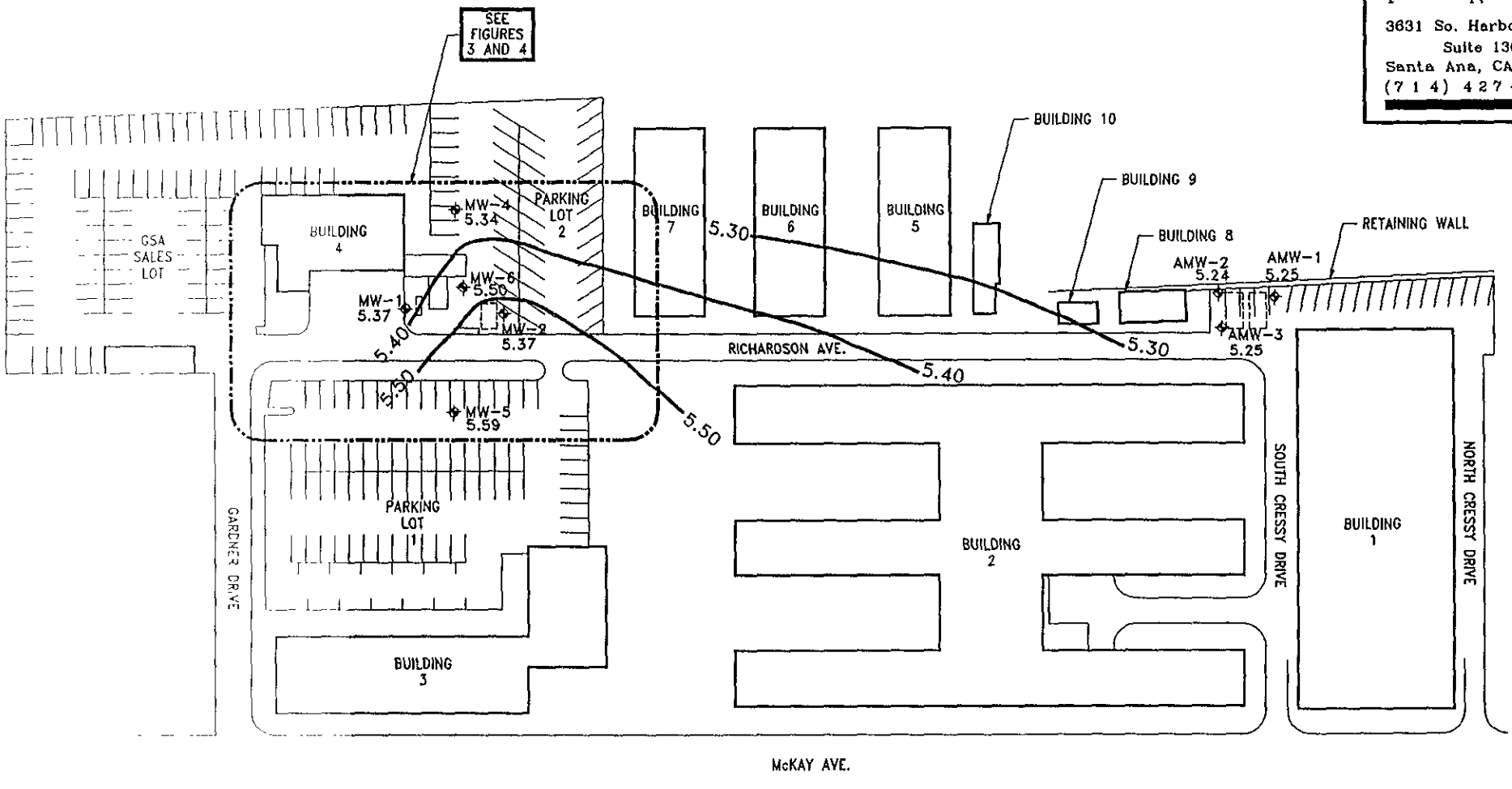
0 10 20 30 40

SCALE 1" = 40'

PROJECT NORTH

SHEET TITLE: FIGURE 4 - TANK 3 & 4 AREA / MONITORING WELL LOCATIONS	CHECKED BY: W.W.M.	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G.R.F.	DATE: MAR. 1998	SHEET: 4 OF 4

C A P E
ENVIRONMENTAL
MANAGEMENT
I N C
3631 So. Harbor Blvd.
Suite 130
Santa Ana, CA 92704
(714) 427-6160



LEGEND

MW-1 5.37 ⌖ EXISTING MONITORING WELL WITH GROUNDWATER LEVEL

5.50 GROUNDWATER CONTOUR GRADIENT

GRAPHIC SCALE

0 10' 50 100 150

PROJECT NORTH

SHEET TITLE: FIGURE 5 - GROUNDWATER GRADIENT MAP 2-18-98	CHECKED BY: B. Millar	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. Fagin	DATE: 4-13-98	SHEET: 5 OF 5

APPENDICES

APPENDIX A

DRILLING PERMIT/APPLICATION
ALAMEDA DEPARTMENT OF PUBLIC WORKS

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
951 TURNER COURT, SUITE 300, HAYWARD, CA 94545-2651
PHONE (510) 670-5575 ANDREAS GODFREY FAX (510) 670-5262
(510) 670-5248 ALVIN KAN

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT ALAMEDA FEDERAL CENTER
620 CENTRAL AVENUE, ALAMEDA, CA

California Coordinates Source _____ ft. Accuracy ± _____ ft
CCN _____ ft CCE _____ ft
APN _____

CLIENT MR. JAMES LOW (9PEC)
Name FEDERAL SERVICES ADMINISTRATION
Address 450 GOLDEN GATE AVE Phone 415/522-3228
City SAN FRANCISCO Zip 94102-3400

APPLICANT
Name BILL MILLAM
CAPE ENVIRONMENTAL Fax 714/427-6761
Address 2313 HARBOR, STE 132 Phone 714/427-6160
City SANTA ANA, CA Zip 92704

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	☐	General	☐
Water Supply	☐	Contamination	☐
Monitoring	X	Well Destruction	☐

PROPOSED WATER SUPPLY WELL USE

New Domestic	☐	Replacement Domestic	☐
Municipal	☐	Irrigation	☐
Industrial	☐	Other _____	☐

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Auger	X
Cable	☐	Other	☐		

DRILLER'S LICENSE NO. 485165 (CREGG DRILLING)

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 15 ft.
Surface Seal Depth 5 ft. Number 3

GEOTECHNICAL PROJECTS
Number of Borings 1 Maximum
Hole Diameter 2 in. Depth 15 ft.

ESTIMATED STARTING DATE 2-16-98
ESTIMATED COMPLETION DATE 2-18-98

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

APPLICANT'S SIGNATURE _____ DATE 1-23-98

FOR OFFICE USE

PERMIT NUMBER 98WR040
WELL NUMBER _____
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

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

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

(C.) GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

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

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

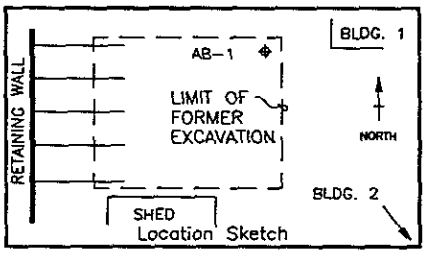
F. WELL DESTRUCTION
See attached

G. SPECIAL CONDITIONS

APPROVED _____ DATE 1/26/98

APPENDIX B

BORING LOGS / WELL CONSTRUCTION DETAILS



Location Sketch

BORING LOG AB-1

Date 2-16-98 Sheet 1 OF 1

Project ALAMEDA FED. CNTR. Project No. 2403C.24

Drilling Co. GREGG Type of Rig B-61

Hole Diameter 8" O.D. in. Drive Weight 140 LB Drop N/A in.

Surface Elevation _____ (msl) Top of Casing Elevation _____ (msl)

Logged by: Bill Millar

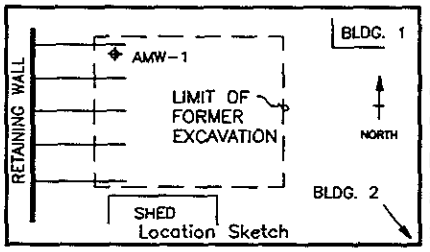
Reviewed by: _____

Depth (Feet)	Well Construction: Casing Detail	Well Construction: Backfill Detail	Samples: Sample ID.	Samples: Time	Samples: Interval	Blows Per 6" Interval	Graphic Log	USCS	OVA/PID (PPM)	SOIL/GEOLOGIC DESCRIPTION
1										4" asphalt
2									N	
3										
4										
5		GROUT CONCRETE	AB-1-5'	1500		N/A		GC	0	@5'-Light olive brown (5Y 5/6), gravely clay little sand, moist, firm (?), no hydrocarbon odor, no sheen.
6										
7										
8										
9										
10			AB-1-10'	1505		N/A		SW	0	@10'-Grayish olive (10Y 4/2), sand, wet, medium-dense (?), no hydrocarbon odor, no sheen, sea shells in sand.
11										
12										
13										
14										
15			AB-1-15'	1515		N/A		SW	0	@15'-Moderate olive brown (5Y 4/4), sand trace gravel, wet, medium-dense (?), no hydrocarbon odor, no sheen, sea shells in sand.
16										
17										
18										
19										
20										NOTE: Winch on rig malfuncting no reliable drop distance, no blow counts.
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

LEGEND
BGS - Below Ground Surface
TD - Total Depth BGS
B - Bentonite Chips 3/8"
BGG - Bentonite Grout
PCC - Portland Cement Concrete

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

CAPE ENVIRONMENTAL MANAGEMENT INC.



Location Sketch

BORING LOG AMW-1

Date 2-16-98 Sheet 1 OF 1

Project ALAMEDA FED. CNTR. Project No. 2403C.24

Drilling Co. GREGG Type of Rig B-61

Hole Diameter 8" O.D. in. Drive Weight 140 LB Drop 30 in.

Surface Elevation _____ (msl) Top of Casing Elevation _____ (msl)

Logged by: Bill Millar

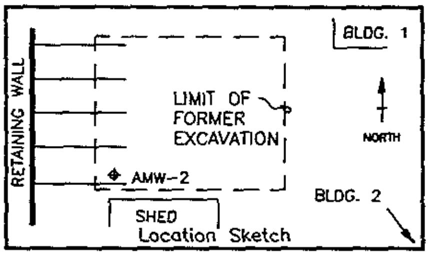
Reviewed by: _____

Depth (Feet)	Well Construction: Casing Detail	Well Construction: Backfill Detail	Well Construction: Sample ID.	Samples: Time	Samples: Interval	Blows Per 6" Interval	Graphic Log	USCS	OVA/PID (PPM)	SOIL/GEOLOGIC DESCRIPTION
1		GROUT CONCRETE.								3" of asphalt
2	BLANK PVC							GW	▽	Pea gravel fill material, excavation. fill
3			BENTONITE PELLETS							
4										
5			NO RECOVERY	0845		6		GW	0	No Recovery, wet, loose.
6						4				
7						2				
8										
9		#3 SAND FILTER PACK								
10	0.01" SLOT SCREEN		NO RECOVERY	0858		11		GW	0	@10'–Dark yellowish brown (10YR 4/2), sandy gravel, wet, medium – dense, no hydro carbon odor, no recovery no soil sample collected.
11						4				
12						4				
13										
14										@15'–Dark yellowish brown (10YR 4/2), sandy gravel, wet, medium – dense, no hydrocarbon odor,
15			NO RECOVERY	0904		8		GW	0	no recovery, no soil sample collected. geotextile in shoe of sampler.
16						12				
17						16				
18										NOTE: Installing the filter pack was diffcult. The gravel caved into the boring as the augers were removed.
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

LEGEND
BGS – Below Ground Surface
TD – Total Depth BGS
B – Bentonite Chips 3/8"
BCG – Bentonite Grout
PCC – Portland Cement Concrete

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

CAPE ENVIRONMENTAL MANAGEMENT INC.



BORING LOG AMW-2

Date: 2-16-98 | Sheet 1 OF 1
Project: ALAMEDA FED. CNTR. | Project No. 2403C.24
Drilling Co.: GREGG | Type of Rig: B-61
Hole Diameter: 8" O.D. in. | Drive Weight: 140 LB | Drop: 30 in.
Surface Elevation: ______ (msl) | Top of Casing Elevation: ______ (msl)

Logged by: Bill Millar
Reviewed by:

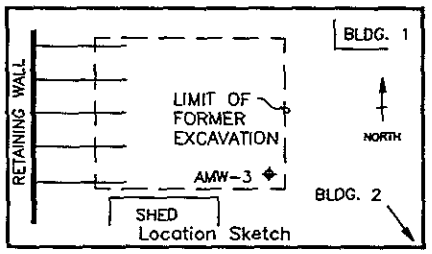
Well Construction (Depth, feet):
- Casing Detail: BLANK PVC (0–5'); 0.01" SLOT SCREEN (5–15')
- Backfill Detail: CONCRETE / GROUT (0–2.5'); BENTONITE PELLETS (2.5–3.5'); #3 SAND FILTER PACK (3.5–15')
- Water level symbol (▽) at approx. 2'

Depth (Feet)	Sample ID.	Time	Blows Per 6" Interval	Graphic Log	USCS	OVA/PID (PPM)	SOIL/GEOLOGIC DESCRIPTION
0							4" asphalt 6" base
5	AMW2-5' Grab Sample	1030	4, 4, 5		GC	0	@5'-Moderate yellowish brown (10YR 5/4) gravelly clay w/sand, grab soil sample from augers, no recover in sampler, wet, firm, no hydrocarbon odor.
10	AMW2-10' Grab Sample	1037	5, 5, 3		SM	0	@10'-Light olive gray (5Y 5/2), gravely fine sand with organics, wet, stiff, no hydrocarbon odor, oily sheen observed in soil sample, grab sample collected from augers, no recovery in sampler.
15	AMW2-15' Grab Sample	1045	12, 7, 8		SP	0	@15'-Olive gray (5Y 3/2), fine sand with organics, wet, medium-dense, no hydrocarbon odor, oily sheen observed in sample.

LEGEND
BGS - Below Ground Surface
TD - Total Depth BGS
B - Bentonite Chips 3/8"
BCG - Bentonite Grout
PCC - Portland Cement Concrete

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

CAPE ENVIRONMENTAL MANAGEMENT INC.



BORING LOG AMW-3

Date 2-16-98 Sheet 1 OF 1

Project ALAMEDA FED. CNTR. Project No. 2403C.24

Drilling Co. GREGG Type of Rig B-61

Hole Diameter 8" O.D. in. Drive Weight 140 LB Drop 30 in.

Surface Elevation _____ (msl) Top of Casing Elevation _____ (msl)

Logged by: Bill Millar

Reviewed by: _____

Depth (Feet)	Well Construction: Casing Detail	Well Construction: Backfill Detail	Samples: Sample ID.	Samples: Time	Samples: Interval	Blows Per 6" Interval	Graphic Log	USCS	OVA/PID (PPM)	SOIL/GEOLOGIC DESCRIPTION
1										3" asphalt
2									▽	
3	BLANK PVC	6" GROUT CONCRETE	BENTONITE PELLETS							
4										
5			AMW3-5' GRAB SAMPLE	1220		4 2 2		GC	0	@5'—Moderate yellowish brown (10YR 5/4), clayey gravel, wet, firm, no hydrocarbon odor, no sheen observed, grab soil sample from augers, no recover in sampler.
6										
7										
8										
9										
10	0.01" SLOT SCREEN	#3 SAND FILTER PACK	AMW3-10' GRAB SAMPLE	1228		2 4 5		SW	0	@10'—Olive gray (5Y 3/2), fine sand, wet, loose, no hydrocarbon odor, no sheen observed in soil sample, grab sample collected from augers, no recovery in sampler, sea shells in sand.
11										
12										
13										
14										@15'—Light olive gray (5Y 5/2), fine grained sand, wet, medium-dense, no hydrocarbon odor, no sheen observed in sample.
15			AMW3-15'	1235		12 12 10		SW	0	
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

LEGEND
BGS – Below Ground Surface
TD – Total Depth BGS
B – Bentonite Chips 3/8"
BCG – Bentonite Grout
PCC – Portland Cement Concrete

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

CAPE ENVIRONMENTAL MANAGEMENT INC.

APPENDIX C

MONITORING WELL DEVELOPMENT LOGS

GREGG

MONITORING WELL DEVELOPMENT LOG

All measurements taken from: [X] Top of Casing [ ] Protective Casing [ ] Ground Level

Well Number AMW-1
Date 2/17/98
Time Start 8:13 End
Client CAFE ALAMEDA
Project FED. OFFICES -
Job Number 7110.24
Installation Date 2/16/98
Well Diameter 2"

Borehole Diameter 8"
Screen Length 10'
Measured Depth (pre-development) 14.90
Measured Depth (post-development)
Static Water Level (ft.) 3.44
Standing Water Column (ft.) 11.46
One Well Volume (gal.) 1.8
One Annulus Vol. (gal.)

Sample ID
Qty. of Drilling Fluid Lost
Minimum Gal. to be Purged
Development Method SURGE, BAIL, PUMP
Purging Equipment 55 BAILER GRUNDFOS PUMP
Water Level Equipment SOLINST
pH/EC Meter HORIBA U-10
Turbidity Meter
Other

MF

Time	Amount Purged (gal)	Field Parameters Measured: EC	pH	Temp.	Turbidity	D.O.	SAL.	GPM / W.L.	Comments	Field Tech.
8:45	1	1.16	6.54	14.8	>999	—	0.05		solid Bottom	
8:52	6	1.23	7.21	15.2	>999	—	0.05			
8:59	10	1.29	7.36	15.2	>999	—	0.05			
9:05		set pump 6' off Bottom						2.0 / 5.44		
9:09	18	1.52	7.40	14.8	>999	—	0.06	2.0 / 3.47		
9:12	24	1.34	7.18	15.0	544	—	0.05	2.0 / 3.47		
9:15	30	1.35	7.19	15.0	26	—	0.06	2.0 / 3.47		
		raise & lower pump through screened interval								
		to clear water.								
	55	total removed								

FINAL FIELD PARAMETER MEASUREMENTS

GREGG

MONITORING WELL DEVELOPMENT LOG

All measurements taken from: ☒ Top of Casing ☐ Protective Casing ☐ Ground Level

Well Number DMW-2
Date 11/17/98
Time Start 11:20 End
Client Cape
Project FED BLDG - ALAMEDA
Job Number 21936.24
Installation Date 2/16/98
Well Diameter 2"

Borehole Diameter 8"
Screen Length 10'
Measured Depth (pre-development) 14.74
Measured Depth (post-development)
Static Water Level (ft.) 3.37
Standing Water Column (ft.) 11.37
One Well Volume (gal.) 1.82
One Annulus Vol. (gal.)

Sample ID
Qty. of Drilling Fluid Lost
Minimum Gal. to be Purged
Development Method Surge, Bail, Pump
Purging Equipment Bladder Pump
Water Level Equipment Solinst
pH/EC Meter Horiba U-10
Turbidity Meter
Other

Time	Amount Purged (gal)	Field Parameters Measured: EC	pH	Temp.	Turbidity	D.O.	SAL.	GPM / W.L.	Comments	Field Tech.
11:40	3	.974	8.08	16.8	>999	—	0.04		Solid Bottom	
11:43	7	.980	8.02	16.5	>999	—	0.04			
11:50	11	1.12	7.85	16.6	>999	—	0.04			
11:55		Set pump 6" off Bottom						1.5 4.62		
12:00	18	1.33	7.50	16.8	>999	—	0.06	1.5 4.62		
12:05	26	1.31	7.43	16.5	>999	—	0.05	1.5 6.22		
12:13	38	1.33	7.52	16.4	346	—	0.06	1.5 6.21		
12:20	48	1.34	7.51	16.4	361	—	0.06	1.5 6.80		
12:27	55	1.35	7.49	16.4	705	—	0.06	1.5 6.80		

FINAL FIELD PARAMETER MEASUREMENTS

GREGG

MONITORING WELL DEVELOPMENT LOG

All measurements taken from: ☐ Top of Casing ☐ Protective Casing ☐ Ground Level

Well Number MW(1)-2
Date 2/17/98
Time Start 9:40 End
Client CAPE
Project FED BLDG - ALAMEDA
Job Number 7103.04
Installation Date 2/16/98
Well Diameter 2"

Borehole Diameter 8"
Screen Length 10'
Measured Depth (pre-development) 14.80
Measured Depth (post-development)
Static Water Level (ft.) 2.98
Standing Water Column (ft.) 11.82
One Well Volume (gal.) 1.89
One Annulus Vol. (gal.)

Sample ID
Qty. of Drilling Fluid Lost
Minimum Gal. to be Purged
Development Method SURGE, BAIL, PUMP 55 GAL DRUM
Purging Equipment GRUNDFOS PUMP
Water Level Equipment SOLINST
pH/EC Meter HORIBA U-10
Turbidity Meter
Other

MF

Time	Amount Purged (gal)	Field Parameters Measured: EC	pH	Temp.	Turbidity	D.O.	SAL.	GPM / W.L.	Comments	Field Tech.
10:10	1 1/2	1.03	8.41	16.3	>999	—	0.04		Solid Bottom	
10:19	5	.808	8.18	15.7	7999	—	0.03			
10:25	9	.783	8.26	15.1	7999	—	0.03	1.5 / 3.28		
10:31	out pump 6" to Bottom									
10:34	14	.614	7.91	14.7	>999	—	0.02	1.5 / 5.12		
10:39	21	.672	7.71	15.1	>999	—	0.02	1.5 / 6.22		
10:45	30	.682	7.52	15.3	552	—	0.02	1.5 / 6.22		
10:52	42	.705	7.51	15.2	281	—	0.03	1.5 / 6.45		
10:59	49	.709	7.46	15.2	61	—	0.03	1.5 / 6.55		
11:03	55	.710	7.39	15.2	41	—	0.03	1.5 / 6.49		

FINAL FIELD PARAMETER MEASUREMENTS

APPENDIX D

GROUNDWATER PURGING AND SAMPLING LOGS

GROUNDWATER PURGING AND SAMPLING LOG

WELL NUMBER: MW-1

SITE: ALAMEDA FEDERAL CENTER JOB NUMBER: 2403C.24

COLLECTOR: BILL MILLAR DATE SAMPLED: 2-18-98

pH / SPECIFIC CONDUCTIVITY METER USED, SERIAL NUMBER: 9511

pH METER CALIBRATION: BUFFERED SOLUTIONS 2-18-98

CONDUCTIVITY METER CALIBRATION: ———

DEPTH TO WATER PRIOR TO PURGING: 2.82 ft. TIME: 0755

DEPTH TO BOTTOM OF WELL: 15' ft. CASING DIAMETER

STANDING WELL VOLUME: 2.07 x 3 = 6.21 gallons (Inches): 2

TIME	TEMP (°C)	pH	CONDUCTIVITY (Umhos)	COLOR	TURBIDITY	OTHERS*	VOLUME PURGED
11:26	64.5	7.71	8.74 X100	CLEAR	NO		1G
11:30	62.3	7.66	8.44X100	"	"		3G
11:36	62.0	7.62	8.45X100	"	"		5G

DEPTH TO WATER AFTER PURGING: 2.85 ft.

START PURGE: 11:26 o'clock

END PURGE: 11:47 o'clock

PURGE DURATION: 21 minutes

PURGE RATE: BAILER gpm

WELL VOLUMES PURGED: 3

SAMPLE NUMBER	CONTAINER(S)	TYPE	FILTERED (Y/N)	TIME	PRESERVATIVES	REMARKS
MW-1	2	BLUE	N	11:30	"	
MW-1	3	VOA	N	11:30	"	

DECON PROCEDURE: (internal) DISPOSABLES

DECON PROCEDURE: (external) ———

* Include other tests, if performed, such as dissolved oxygen, Eh, etc.

GROUNDWATER PURGING AND SAMPLING LOG

WELL NUMBER: AMW-1

SITE: [illegible] JOB NUMBER: 2403C.2L

COLLECTOR: ZAK MILLAR DATE SAMPLED: 2-18-98

pH / SPECIFIC CONDUCTIVITY METER USED, SERIAL NUMBER: 9511

pH METER CALIBRATION: 2-18-98 BUFFERED SOLUTIONS

CONDUCTIVITY METER CALIBRATION: _____

DEPTH TO WATER PRIOR TO PURGING: 3.48 ft. TIME: 0810

DEPTH TO BOTTOM OF WELL: 15' ft. CASING DIAMETER

STANDING WELL VOLUME: 1.96 x 3 = 5.88 gallons (Inches): 2

TIME	TEMP (°C)	pH	CONDUCTIVITY (Umhos)	COLOR	TURBIDITY	OTHERS*	VOLUME PURGED
0942	63.7	8.25	1.51 x1000	CLEAR	NO		<1G
0945	61.5	8.10	1.46X1000	"	"		1G
0948	61.2	8.05	1.44X1000	"	"		2.5G
0950	60.7	7.92	1.41X1000	"	"		3G
0953	60.9	—	1.46X1000	"	"		4G
0959	61.2	7.82	1.45X1000	"	"		6G

DEPTH TO WATER AFTER PURGING: 3.49 ft.

START PURGE: 0942 o'clock

END PURGE: 0959 o'clock

PURGE DURATION: 17 minutes

PURGE RATE: BAILER gpm

WELL VOLUMES PURGED: _____

SAMPLE NUMBER	CONTAINER(S)	TYPE	FILTERED (Y/N)	TIME	PRESERVATIVES	REMARKS
AMW-1	2	BLZL	N	1002		

DECON PROCEDURE: (internal) _____

DECON PROCEDURE: (external) _____

* Include other tests, if performed, such as dissolved oxygen, Eh, etc.

GROUNDWATER PURGING AND SAMPLING LOG

WELL NUMBER: AMW-2

SITE: ALAMEDA FEDERAL CENTER JOB NUMBER: 2403C.24

COLLECTOR: BILL MILLER DATE SAMPLED: 2-18-98

pH / SPECIFIC CONDUCTIVITY METER USED, SERIAL NUMBER: 9511

pH METER CALIBRATION: 2-18-98 BUFFER SOLUTIONS

CONDUCTIVITY METER CALIBRATION:

DEPTH TO WATER PRIOR TO PURGING: 3.60' ft. TIME: 0805

DEPTH TO BOTTOM OF WELL: 15' ft. CASING DIAMETER

STANDING WELL VOLUME: 1.9 x 3 = 5.7 gallons (Inches): 2"

TIME	TEMP (°C)	pH	CONDUCTIVITY (Umhos)	COLOR	TURBIDITY	OTHERS*	VOLUME PURGED
0825	60.1	9.28	7.65x100	GRAY	YES	SHEEN	<1.6 GAL
0828	60.3	9.32	7.57x100	GRAY	YES		<1.6 GAL
0836	61.1	9.21	7.76x100	"	"		3 GAL
0841	61.3	9.31	0.81x100	"	"		4 GAL
0843	61.6	9.00	11.26x100	"	"		4.5 GAL
0846	61.3	—	11.44x100	"	"		5 GAL
0849	61.3	8.68	12.22x100	"	"		5.8 GAL

DEPTH TO WATER AFTER PURGING: 3.71 ft.

START PURGE: 0825 o'clock

END PURGE: 0850 o'clock

PURGE DURATION: 25 MIN minutes

PURGE RATE: BAILER gpm

WELL VOLUMES PURGED: 3

SAMPLE NUMBER	CONTAINER(S)	TYPE	FILTERED (Y/N)	TIME	PRESERVATIVES	REMARKS
AMW-2	2-VOA	VOA	N	0900		
AMW-2	2	VOA	N	0900		

DECON PROCEDURE: (internal) SUBMERSIBLE PUMP

DECON PROCEDURE: (external)

* Include other tests, if performed, such as dissolved oxygen, Eh, etc.

GROUNDWATER PURGING AND SAMPLING LOG

WELL NUMBER: AMW-3

SITE: ALAMEDA FEDERAL CENTER JOB NUMBER: 2403C.24

COLLECTOR: BILL MILLAR DATE SAMPLED: 2-18-98

pH / SPECIFIC CONDUCTIVITY METER USED, SERIAL NUMBER: 9511

pH METER CALIBRATION: 2-18-98 BUFFERED SOLUTIONS

CONDUCTIVITY METER CALIBRATION:

DEPTH TO WATER PRIOR TO PURGING: 3.28 ft. TIME: 0857

DEPTH TO BOTTOM OF WELL: 15' ft. CASING DIAMETER

STANDING WELL VOLUME: 1.99 x 3 = 5.98 gallons (Inches): 2

TIME	TEMP (°C)	pH	CONDUCTIVITY (Umhos)	COLOR	TURBIDITY	OTHERS*	VOLUME PURGED
1034	65.2	9.08	8.52x100	BROWN	YES		1 G
1037	63.2	9.09	8.24x100	BROWN	YES		2.5G
1039	63.1	8.94	7.94x100	"	"		3 G
1041	62.5	8.71	7.49x100	"	"		3.5G
1045	61.8	8.46	7.21x100	"	"		5G
1050	62.0	8.36	7.12x100	"	"		6G

DEPTH TO WATER AFTER PURGING: 3.29 ft.

START PURGE: _____ o'clock

END PURGE: _____ o'clock

PURGE DURATION: _____ minutes

PURGE RATE: _____ gpm

WELL VOLUMES PURGED: _____

SAMPLE NUMBER	CONTAINER(S)	TYPE	FILTERED (Y/N)	TIME	PRESERVATIVES	REMARKS

DECON PROCEDURE: (internal) _____

DECON PROCEDURE: (external) _____

* Include other tests, if performed, such as dissolved oxygen, Eh, etc.

APPENDIX E

CERTIFIED LABORATORY REPORTS AND SAMPLE CHAIN-OF-CUSTODY DOCUMENTATION

Our Quality Control Is Your Quality Assurance

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 03/26/98
Log #: L28267-1

Sample Description:

Soil Analysis
2403C.24

Label: AMW-2-5'
Date Sampled: 02/16/98
Time Sampled: 10:30
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
General Chemistry							
Oil/Grease	350	mg/kg (dw)	5520	10	03/13	03/13	RL
Percent Solids							
Percent Solid	88	%	SM2540B	0.10	03/06	03/06	MG
Gasoline Range Organics							
Gasoline Range Organics	BDL	mg/kg (dw)	5030/8015M	1.0	02/25	02/25	CAL
Dilution Factor	1.0		5030/8015M		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	104	%	5030/8015M	50-150	02/25	02/25	CAL
Diesel Range Organics							
DRO	14	mg/kg (dw)	3550/8015M	1.0	02/20	02/24	CAL
Dilution Factor	1.0		3550/8015M		02/20	02/24	CAL
Surrogate Recoveries:							
O-Terphenyl	63.0	%	3550/8015M	50-150	02/20	02/24	CAL
Volatile Organic Aromatics							
Benzene	BDL	mg/kg (dw)	8020	0.0050	02/26	02/26	CAL
Ethylbenzene	BDL	mg/kg (dw)	8020	0.0050	02/26	02/26	CAL
Toluene	BDL	mg/kg (dw)	8020	0.0050	02/26	02/26	CAL
Total Xylenes	BDL	mg/kg (dw)	8020	0.0050	02/26	02/26	CAL
Dilution Factor	1.0		8020		02/26	02/26	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	104	%	8020	58-144	02/26	02/26	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
2-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
1-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-1

Sample Description:

Soil Analysis
2403C.24

Label: AMW-2-5'
Date Sampled: 02/16/98
Time Sampled: 10:30
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons (continued)							
Acenaphthylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Acenaphthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluorene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Phenanthrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Chrysene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(b)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(k)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dibenzo(a,h)Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Indeno(1,2,3-c,d)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(g,h,i)perylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dilution Factor	1.0		3550/8270		03/11	03/13	SW
Surrogate Recoveries:							
Nitrobenzene-d5	74.0	%	3550/8270	23-120	03/11	03/13	SW
2-Fluorobiphenyl	81.0	%	3550/8270	30-115	03/11	03/13	SW
Terphenyl-d14	104	%	3550/8270	18-137	03/11	03/13	SW
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromoform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromomethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Carbon Tetrachloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dibromochloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,3-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,4-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dichlorodifluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 3 of 3
Date: 03/26/98
Log #: L28267-1

Sample Description:

Soil Analysis
2403C.24

Label: AMW-2-5'
Date Sampled: 02/16/98
Time Sampled: 10:30
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,3-Dichloropropene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,3-Dichloropropen	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Methylene Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2,2-Tetrachloroethan	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Tetrachloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,1-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichlorofluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Vinyl Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-Trichloro-1,2,2-Tr	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dilution Factor	1.0		8010		02/24	02/24	CAL
Surrogate Recoveries:							
Bromochloromethane	110	%	8010	65-131	02/24	02/24	CAL

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G	HRS# E86240,86356	NC CERT# 444
SUB HRS# 86122,86109,E86048	ADEM ID# 40850	ND CERT# R-148
SC CERT# 96031	TN CERT# 02985	CT CERT# PH-0122
ELPAT# 13801	CA CERT# I-1068	USACE CERT
VA CERT# 00395	RI CERT# 191	MA CERT# M-FL449

Respectfully submitted,

Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 03/26/98
Log #: L28267-2

Sample Description:

Soil Analysis
2403C.24

Label: AMW-2-10'
Date Sampled: 02/16/98
Time Sampled: 10:37
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
General Chemistry							
Oil/Grease	310	mg/kg (dw)	5520	10	03/13	03/13	RL
Percent Solids							
Percent Solid	80	%	SM2540B	0.10	03/06	03/06	MG
Gasoline Range Organics							
Gasoline Range Organics	BDL	mg/kg (dw)	5030/8015M	1.0	02/25	02/25	CAL
Dilution Factor	1.0		5030/8015M		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	107	%	5030/8015M	50-150	02/25	02/25	CAL
Diesel Range Organics							
DRO	5.9	mg/kg (dw)	3550/8015M	1.0	02/20	02/24	CAL
Dilution Factor	1.0		3550/8015M		02/20	02/24	CAL
Surrogate Recoveries:							
O-Terphenyl	72.5	%	3550/8015M	50-150	02/20	02/24	CAL
Volatile Organic Aromatics							
Benzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Ethylbenzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Toluene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Total Xylenes	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Dilution Factor	1.0		8020		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	107	%	8020	58-144	02/25	02/25	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
2-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
1-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-2

Sample Description:

Soil Analysis
2403C.24

Label: AMW-2-10'
Date Sampled: 02/16/98
Time Sampled: 10:37
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons (continued)							
Acenaphthylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Acenaphthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluorene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Phenanthrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Chrysene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(b)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(k)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dibenzo(a,h)Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Indeno(1,2,3-c,d)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(g,h,i)perylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dilution Factor	1.0		3550/8270		03/11	03/13	SW
Surrogate Recoveries:							
Nitrobenzene-d5	72.0	%	3550/8270	23-120	03/11	03/13	SW
2-Fluorobiphenyl	67.0	%	3550/8270	30-115	03/11	03/13	SW
Terphenyl-d14	97.0	%	3550/8270	18-137	03/11	03/13	SW
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromoform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromomethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Carbon Tetrachloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dibromochloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,3-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,4-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dichlorodifluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-2

Sample Description:

Soil Analysis
2403C.24

Label: AMW-2-10'
Date Sampled: 02/16/98
Time Sampled: 10:37
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,3-Dichloropropene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,3-Dichloropropen	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Methylene Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2,2-Tetrachloroethan	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Tetrachloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,1-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichlorofluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Vinyl Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-Trichloro-1,2,2-Tr	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dilution Factor	1.0		8010		02/24	02/24	CAL
Surrogate Recoveries:							
Bromochloromethane	118	%	8010	65-131	02/24	02/24	CAL

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G
SUB HRS# 86122,86109,E86048
SC CERT# 96031
ELPAT# 13801
VA CERT# 00395

HRS# E86240,86356
ADEM ID# 40850
TN CERT# 02985
CA CERT# I-1068
RI CERT# 191

NC CERT# 444
ND CERT# R-148
CT CERT# PH-0122
USACE CERT
MA CERT# M-FL449

Respectfully submitted,

Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 03/26/98
Log #: L28267-3

Sample Description:

Soil Analysis
2403C.24

Label: AMW-2-15'
Date Sampled: 02/16/98
Time Sampled: 10:45
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
General Chemistry							
Oil/Grease	400	mg/kg (dw)	5520	10	03/13	03/13	RL
Percent Solids							
Percent Solid	90	%	SM2540B	0.10	03/06	03/06	MG
Gasoline Range Organics							
Gasoline Range Organics	BDL	mg/kg (dw)	5030/8015M	1.0	02/25	02/25	CAL
Dilution Factor	1.0		5030/8015M		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	104	%	5030/8015M	50-150	02/25	02/25	CAL
Diesel Range Organics							
DRO	7.9	mg/kg (dw)	3550/8015M	1.0	02/20	02/24	CAL
Dilution Factor	1.0		3550/8015M		02/20	02/24	CAL
Surrogate Recoveries:							
O-Terphenyl	70.5	%	3550/8015M	50-150	02/20	02/24	CAL
Volatile Organic Aromatics							
Benzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Ethylbenzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Toluene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Total Xylenes	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Dilution Factor	1.0		8020		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	104	%	8020	58-144	02/25	02/25	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
2-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
1-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-3

Sample Description:

Soil Analysis
2403C.24

Label: AMW-2-15'
Date Sampled: 02/16/98
Time Sampled: 10:45
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons		(continued)					
Acenaphthylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Acenaphthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluorene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Phenanthrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Chrysene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(b)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(k)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dibenzo(a,h)Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Indeno(1,2,3-c,d)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(g,h,i)perylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dilution Factor	1.0		3550/8270		03/11	03/13	SW
Surrogate Recoveries:							
Nitrobenzene-d5	76.0	%	3550/8270	23-120	03/11	03/13	SW
2-Fluorobiphenyl	78.0	%	3550/8270	30-115	03/11	03/13	SW
Terphenyl-d14	97.0	%	3550/8270	18-137	03/11	03/13	SW
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromoform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromomethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Carbon Tetrachloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dibromochloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,3-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,4-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dichlorodifluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-3

Sample Description:

Soil Analysis
2403C.24

Label: AMW-2-15'
Date Sampled: 02/16/98
Time Sampled: 10:45
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,3-Dichloropropene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,3-Dichloropropen	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Methylene Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2,2-Tetrachloroethan	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Tetrachloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,1-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichlorofluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Vinyl Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-trichloro-1,2,2-tr	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dilution Factor	1.0		8010		02/24	02/24	CAL
Surrogate Recoveries:							
Bromochloromethane	106	%	8010	65-131	02/24	02/24	CAL

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G
SUB HRS# 86122,86109,E86048
SC CERT# 96031
ELPAT# 13801
VA CERT# 00395
HRS# E86240,86356
ADEM ID# 40850
TN CERT# 02985
CA CERT# I-1068
RI CERT# 191
NC CERT# 444
ND CERT# R-148
CT CERT# PH-0122
USACE CERT
MA CERT# M-FL449

Respectfully submitted,

Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 03/26/98
Log #: L28267-4

Sample Description:

Soil Analysis
2403C.24

Label: AMW-3-5'
Date Sampled: 02/16/98
Time Sampled: 12:20
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
General Chemistry							
Oil/Grease	530	mg/kg (dw)	5520	10	03/13	03/13	RL
Percent Solids							
Percent Solid	89	%	SM2540B	0.10	03/06	03/06	MG
Gasoline Range Organics							
Gasoline Range Organics	BDL	mg/kg (dw)	5030/8015M	1.0	02/25	02/25	CAL
Dilution Factor	1.0		5030/8015M		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	100	%	5030/8015M	50-150	02/25	02/25	CAL
Diesel Range Organics							
DRO	22	mg/kg (dw)	3550/8015M	1.0	02/20	02/24	CAL
Dilution Factor	1.0		3550/8015M		02/20	02/24	CAL
Surrogate Recoveries:							
O-Terphenyl	92.5	%	3550/8015M	50-150	02/20	02/24	CAL
Volatile Organic Aromatics							
Benzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Ethylbenzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Toluene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Total Xylenes	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Dilution Factor	1.0		8020		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	100	%	8020	58-144	02/25	02/25	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
2-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
1-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-4

Sample Description:

Soil Analysis
2403C.24

Label: AMW-3-5'
Date Sampled: 02/16/98
Time Sampled: 12:20
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons (continued)							
Acenaphthylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Acenaphthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluorene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Phenanthrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Chrysene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(b)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(k)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dibenzo(a,h)Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Indeno(1,2,3-c,d)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(g,h,i)perylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dilution Factor	1.0		3550/8270		03/11	03/13	SW
Surrogate Recoveries:							
Nitrobenzene-d5	71.0	%	3550/8270	23-120	03/11	03/13	SW
2-Fluorobiphenyl	69.0	%	3550/8270	30-115	03/11	03/13	SW
Terphenyl-d14	91.0	%	3550/8270	18-137	03/11	03/13	SW
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromoform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromomethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Carbon Tetrachloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dibromochloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,3-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,4-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dichlorodifluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-4

Sample Description:

Soil Analysis
2403C.24

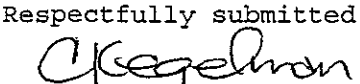
Label: AMW-3-5'
Date Sampled: 02/16/98
Time Sampled: 12:20
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,3-Dichloropropene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,3-Dichloropropen	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Methylene Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2,2-Tetrachloroethan	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Tetrachloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,1-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichlorofluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Vinyl Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-trichloro-1,2,2-tr	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dilution Factor	1.0		8010		02/24	02/24	CAL
Surrogate Recoveries:							
Bromochloromethane	114	%	8010	65-131	02/24	02/24	CAL

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G	HRS# E86240,86356	NC CERT# 444	
SUB HRS# 86122,86109,E86048	ADEM ID# 40850	ND CERT# R-148	
SC CERT# 96031	TN CERT# 02985	CT CERT# PH-0122	
ELPAT# 13801	CA CERT# I-1068	USACE CERT	
VA CERT# 00395	RI CERT# 191	MA CERT# M-FL449	

Respectfully submitted,



Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 03/26/98
Log #: L28267-5

Sample Description:

Soil Analysis
2403C.24

Label: AMW-3-10'
Date Sampled: 02/16/98
Time Sampled: 12:28
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
General Chemistry							
Oil/Grease	160	mg/kg (dw)	5520	10	03/13	03/13	RL
Percent Solids							
Percent Solid	60	%	SM2540B	0.10	03/06	03/06	MG
Gasoline Range Organics							
Gasoline Range Organics	BDL	mg/kg (dw)	5030/8015M	1.0	02/25	02/25	CAL
Dilution Factor	1.0		5030/8015M		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	105	%	5030/8015M	50-150	02/25	02/25	CAL
Diesel Range Organics							
DRO	35	mg/kg (dw)	3550/8015M	1.0	02/20	02/24	CAL
Dilution Factor	1.0		3550/8015M		02/20	02/24	CAL
Surrogate Recoveries:							
O-Terphenyl	106	%	3550/8015M	50-150	02/20	02/24	CAL
Volatile Organic Aromatics							
Benzene	BDL	mg/kg (dw)	8020	0.0050	02/26	02/26	CAL
Ethylbenzene	BDL	mg/kg (dw)	8020	0.0050	02/26	02/26	CAL
Toluene	BDL	mg/kg (dw)	8020	0.0050	02/26	02/26	CAL
Total Xylenes	BDL	mg/kg (dw)	8020	0.0050	02/26	02/26	CAL
Dilution Factor	1.0		8020		02/26	02/26	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	105	%	8020	58-144	02/26	02/26	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
2-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
1-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-5

Sample Description:

Soil Analysis
2403C.24

Label: AMW-3-10'
Date Sampled: 02/16/98
Time Sampled: 12:28
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons		**(continued)**					
Acenaphthylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Acenaphthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluorene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Phenanthrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Pyrene	0.27	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Chrysene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(b)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(k)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dibenzo(a,h)Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Indeno(1,2,3-c,d)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(g,h,i)perylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dilution Factor	1.0		3550/8270		03/11	03/13	SW
Surrogate Recoveries:							
Nitrobenzene-d5	74.0	%	3550/8270	23-120	03/11	03/13	SW
2-Fluorobiphenyl	75.0	%	3550/8270	30-115	03/11	03/13	SW
Terphenyl-d14	97.0	%	3550/8270	18-137	03/11	03/13	SW
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromoform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromomethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Carbon Tetrachloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dibromochloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,3-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,4-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dichlorodifluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 3 of 3
Date: 03/26/98
Log #: L28267-5

Sample Description:

Soil Analysis
2403C.24

Label: AMW-3-10'
Date Sampled: 02/16/98
Time Sampled: 12:28
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,3-Dichloropropene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,3-Dichloropropen	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Methylene Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2,2-Tetrachloroethan	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Tetrachloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,1-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichlorofluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-trichloro-1,2,2-tr	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dilution Factor	1.0		8010		02/24	02/24	CAL
Surrogate Recoveries:							
Bromochloromethane	121	%	8010	65-131	02/24	02/24	CAL

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G
SUB HRS# 86122,86109,E86048
SC CERT# 96031
ELPAT# 13801
VA CERT# 00395
HRS# E86240,86356
ADEM ID# 40850
TN CERT# 02985
CA CERT# I-1068
RI CERT# 191
NC CERT# 444
ND CERT# R-148
CT CERT# PH-0122
USACE CERT
MA CERT# M-FL449

Respectfully submitted,
CKegelman
Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 03/26/98
Log #: L28267-6

Sample Description:

Soil Analysis
2403C.24

Label: AMW-3-15'
Date Sampled: 02/16/98
Time Sampled: 12:35
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
General Chemistry							
Oil/Grease	BDL	mg/kg (dw)	5520	10	03/13	03/13	RL
Percent Solids							
Percent Solid	83	%	SM2540B	0.10	03/06	03/06	MG
Gasoline Range Organics							
Gasoline Range Organics	BDL	mg/kg (dw)	5030/8015M	1.0	02/25	02/25	CAL
Dilution Factor	1.0		5030/8015M		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	103	%	5030/8015M	50-150	02/25	02/25	CAL
Diesel Range Organics							
DRO	BDL	mg/kg (dw)	3550/8015M	1.0	02/20	02/24	CAL
Dilution Factor	1.0		3550/8015M		02/20	02/24	CAL
Surrogate Recoveries:							
O-Terphenyl	107	%	3550/8015M	50-150	02/20	02/24	CAL
Volatile Organic Aromatics							
Benzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Ethylbenzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Toluene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Total Xylenes	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Dilution Factor	1.0		8020		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	103	%	8020	58-144	02/25	02/25	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
2-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
1-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-6

Sample Description:

Soil Analysis
2403C.24

Label: AMW-3-15'
Date Sampled: 02/16/98
Time Sampled: 12:35
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons (continued)							
Acenaphthylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Acenaphthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluorene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Phenanthrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Chrysene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(b)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(k)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dibenzo(a,h)Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Indeno(1,2,3-c,d)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(g,h,i)perylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dilution Factor	1.0		3550/8270		03/11	03/13	SW
Surrogate Recoveries:							
Nitrobenzene-d5	71.0	%	3550/8270	23-120	03/11	03/13	SW
2-Fluorobiphenyl	74.0	%	3550/8270	30-115	03/11	03/13	SW
Terphenyl-d14	104	%	3550/8270	18-137	03/11	03/13	SW
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromoform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromomethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Carbon Tetrachloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dibromochloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,3-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,4-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dichlorodifluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-6

Sample Description:

Soil Analysis
2403C.24

Label: AMW-3-15'
Date Sampled: 02/16/98
Time Sampled: 12:35
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,3-Dichloropropene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,3-Dichloropropen	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Methylene Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2,2-Tetrachloroethan	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Tetrachloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,1-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichlorofluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Vinyl Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-trichloro-1,2,2-tr	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dilution Factor	1.0		8010		02/24	02/24	CAL
Surrogate Recoveries:							
Bromochloromethane	103	%	8010	65-131	02/24	02/24	CAL

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G
SUB HRS# 86122,86109,E86048
SC CERT# 96031
ELPAT# 13801
VA CERT# 00395
HRS# E86240,86356
ADEM ID# 40850
TN CERT# 02985
CA CERT# I-1068
RI CERT# 191
NC CERT# 444
ND CERT# R-148
CT CERT# PH-0122
USACE CERT
MA CERT# M-FL449

Respectfully submitted,
CKegelman
Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 03/26/98
Log #: L28267-7

Sample Description:

Soil Analysis
2403C.24

Label: AB-1-5'
Date Sampled: 02/16/98
Time Sampled: 15:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
General Chemistry							
Oil/Grease	BDL	mg/kg (dw)	5520	10	03/13	03/13	RL
Percent Solids							
Percent Solid	90	%	SM2540B	0.10	03/06	03/06	MG
Gasoline Range Organics							
Gasoline Range Organics	BDL	mg/kg (dw)	5030/8015M	1.0	02/25	02/25	CAL
Dilution Factor	1.0		5030/8015M		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	110	%	5030/8015M	50-150	02/25	02/25	CAL
Diesel Range Organics							
DRO	17	mg/kg (dw)	3550/8015M	10	02/20	02/24	CAL
Dilution Factor	1.0		3550/8015M		02/20	02/24	CAL
Surrogate Recoveries:							
O-Terphenyl	62.5	%	3550/8015M	50-150	02/20	02/24	CAL
Volatile Organic Aromatics							
Benzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Ethylbenzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Toluene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Total Xylenes	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Dilution Factor	1.0		8020		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	110	%	8020	58-144	02/25	02/25	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
2-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
1-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-7

Sample Description:

Soil Analysis
2403C.24

Label: AB-1-5'
Date Sampled: 02/16/98
Time Sampled: 15:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons		(continued)					
Acenaphthylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Acenaphthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluorene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Phenanthrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Chrysene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(b)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(k)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dibenzo(a,h)Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Indeno(1,2,3-c,d)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(g,h,i)perylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dilution Factor	1.0		3550/8270		03/11	03/13	SW
Surrogate Recoveries:							
Nitrobenzene-d5	73.0	%	3550/8270	23-120	03/11	03/13	SW
2-Fluorobiphenyl	77.0	%	3550/8270	30-115	03/11	03/13	SW
Terphenyl-d14	105	%	3550/8270	18-137	03/11	03/13	SW
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromoform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromomethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Carbon Tetrachloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dibromochloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,3-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,4-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dichlorodifluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-7

Sample Description:

Soil Analysis
2403C.24

Label: AB-1-5'
Date Sampled: 02/16/98
Time Sampled: 15:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,3-Dichloropropene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,3-Dichloropropen	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Methylene Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2,2-Tetrachloroethan	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Tetrachloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,1-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichlorofluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Vinyl Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-trichloro-1,2,2-tr	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dilution Factor	1.0		8010		02/24	02/24	CAL
Surrogate Recoveries:							
Bromochloromethane	113	%	8010	65-131	02/24	02/24	CAL

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G
SUB HRS# 86122,86109,E86048
SC CERT# 96031
ELPAT# 13801
VA CERT# 00395
HRS# E86240,86356
ADEM ID# 40850
TN CERT# 02985
CA CERT# I-1068
RI CERT# 191
NC CERT# 444
ND CERT# R-148
CT CERT# PH-0122
USACE CERT
MA CERT# M-FL449

Respectfully submitted,

Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-8

Sample Description:

Soil Analysis
2403C.24

Label: AB-1-10'
Date Sampled: 02/16/98
Time Sampled: 15:05
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
General Chemistry							
Oil/Grease	15	mg/kg (dw)	5520	10	03/13	03/13	RL
Percent Solids							
Percent Solid	86	%	SM2540B	0.10	03/06	03/06	MG
Gasoline Range Organics							
Gasoline Range Organics	BDL	mg/kg (dw)	5030/8015M	1.0	02/25	02/25	CAL
Dilution Factor	1.0		5030/8015M		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	106	%	5030/8015M	50-150	02/25	02/25	CAL
Diesel Range Organics							
DRO	5.9	mg/kg (dw)	3550/8015M	1.0	02/20	02/24	CAL
Dilution Factor	1.0		3550/8015M		02/20	02/24	CAL
Surrogate Recoveries:							
O-Terphenyl	85.0	%	3550/8015M	50-150	02/20	02/24	CAL
Volatile Organic Aromatics							
Benzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Ethylbenzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Toluene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Total Xylenes	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Dilution Factor	1.0		8020		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	106	%	8020	58-144	02/25	02/25	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
2-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
1-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-8

Sample Description:

Soil Analysis
2403C.24

Label: AB-1-10'
Date Sampled: 02/16/98
Time Sampled: 15:05
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons (continued)							
Acenaphthylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Acenaphthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluorene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Phenanthrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Chrysene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(b)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(k)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dibenzo(a,h)Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Indeno(1,2,3-c,d)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(g,h,i)perylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dilution Factor	1.0		3550/8270		03/11	03/13	SW
Surrogate Recoveries:							
Nitrobenzene-d5	72.0	%	3550/8270	23-120	03/11	03/13	SW
2-Fluorobiphenyl	80.0	%	3550/8270	30-115	03/11	03/13	SW
Terphenyl-d14	108	%	3550/8270	18-137	03/11	03/13	SW
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Bromoform	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Bromomethane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Carbon Tetrachloride	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Chlorobenzene	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Chloroethane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Chloroform	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Chloromethane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Dibromochloromethane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
1,2-Dichlorobenzene	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
1,3-Dichlorobenzene	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
1,4-Dichlorobenzene	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Dichlorodifluoromethane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
1,1-Dichloroethane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
1,2-Dichloroethane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
1,1-Dichloroethene	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Cis-1,2-Dichloroethene	BDL	mg/kg (dw)	8260	0 0050	03/07	03/07	CAL
Trans-1,2-Dichloroethene	BDL	mg/kg (dw)	8260	0 0050	03/07	03/07	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-8

Sample Description:

Soil Analysis
2403C.24

Label: AB-1-10'
Date Sampled: 02/16/98
Time Sampled: 15:05
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Cis-1,3-Dichloropropene	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Trans-1,3-Dichloropropen	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Methylene Chloride	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
1,1,2,2-Tetrachloroethan	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Tetrachloroethene	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
1,1,1-Trichloroethane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
1,1,2-Trichloroethane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Trichloroethene	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Trichlorofluoromethane	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Vinyl Chloride	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
1,1,2-trichloro-1,2,2-tr	BDL	mg/kg (dw)	8260	0.0050	03/07	03/07	CAL
Dilution Factor	1.0		8260		03/07	03/07	CAL
Surrogate Recoveries:							
Dibromofluoromethane	109	%	8260	58-146	03/07	03/07	CAL
Toluene-D8	88.0	%	8260	78-118	03/07	03/07	CAL
4-Bromofluorobenzene	102	%	8260	65-131	03/07	03/07	CAL

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G
SUB HRS# 86122,86109,E86048
SC CERT# 96031
ELPAT# 13801
VA CERT# 00395
HRS# E86240,86356
ADEM ID# 40850
TN CERT# 02985
CA CERT# I-1068
RI CERT# 191
NC CERT# 444
ND CERT# R-148
CT CERT# PH-0122
USACE CERT
MA CERT# M-FL449

Respectfully submitted,
Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 03/26/98
Log #: L28267-9

Sample Description:

Soil Analysis
2403C.24

Label: AB-1-15'
Date Sampled: 02/16/98
Time Sampled: 15:15
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
General Chemistry							
Oil/Grease	BDL	mg/kg (dw)	5520	10	03/13	03/13	RL
Percent Solids							
Percent Solid	78	%	SM2540B	0.10	03/06	03/06	MG
Gasoline Range Organics							
Gasoline Range Organics	BDL	mg/kg (dw)	5030/8015M	1.0	02/25	02/25	CAL
Dilution Factor	1.0		5030/8015M		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	115	%	5030/8015M	50-150	02/25	02/25	CAL
Diesel Range Organics							
DRO	8.8	mg/kg (dw)	3550/8015M	1.0	02/20	02/24	CAL
Dilution Factor	1.0		3550/8015M		02/20	02/24	CAL
Volatile Organic Aromatics							
Benzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Ethylbenzene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Toluene	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Total Xylenes	BDL	mg/kg (dw)	8020	0.0050	02/25	02/25	CAL
Dilution Factor	1.0		8020		02/25	02/25	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	115	%	8020	58-144	02/25	02/25	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
2-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
1-Methylnaphthalene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Acenaphthylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Acenaphthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-9

Sample Description:

Soil Analysis
2403C.24

Label: AB-1-15'
Date Sampled: 02/16/98
Time Sampled: 15:15
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons		**(continued)**					
Fluorene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Phenanthrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Chrysene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(b)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(k)fluoranthene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(a)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dibenzo(a,h)Anthracene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Indeno(1,2,3-c,d)pyrene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Benzo(g,h,i)perylene	BDL	mg/kg (dw)	3550/8270	0.10	03/11	03/13	SW
Dilution Factor	1.0		3550/8270		03/11	03/13	SW
Surrogate Recoveries:							
Nitrobenzene-d5	74.0	%	3550/8270	23-120	03/11	03/13	SW
2-Fluorobiphenyl	76.0	%	3550/8270	30-115	03/11	03/13	SW
Terphenyl-d14	102	%	3550/8270	18-137	03/11	03/13	SW
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromoform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Bromomethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Carbon Tetrachloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloroform	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Chloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dibromochloromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,3-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,4-Dichlorobenzene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dichlorodifluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trans-1,2-Dichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,2-Dichloropropane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Cis-1,3-Dichloropropene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 03/26/98
Log #: L28267-9

Sample Description:

Soil Analysis
2403C.24

Label: AB-1-15'
Date Sampled: 02/16/98
Time Sampled: 15:15
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
Trans-1,3-Dichloropropen	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Methylene Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2,2-Tetrachloroethan	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Tetrachloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,1-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-Trichloroethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichloroethene	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Trichlorofluoromethane	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Vinyl Chloride	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
1,1,2-trichloro-1,2,2-tr	BDL	mg/kg (dw)	8010	0.0050	02/24	02/24	CAL
Dilution Factor	1.0		8010		02/24	02/24	CAL
Surrogate Recoveries:							
Bromochloromethane	108	%	8010	65-131	02/24	02/24	CAL

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G
SUB HRS# 86122,86109,E86048
SC CERT# 96031
ELPAT# 13801
VA CERT# 00395
HRS# E86240,86356
ADEM ID# 40850
TN CERT# 02985
CA CERT# I-1068
RI CERT# 191
NC CERT# 444
ND CERT# R-148
CT CERT# PH-0122
USACE CERT
MA CERT# M-FL449

Respectfully submitted,
C Kegelman
Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 04/07/98
Log #: L28267-10

Sample Description:

Groundwater Analysis
2403C.24

Label: AMW-1
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Gasoline Range Organics							
Gasoline Range Organics	BDL	mg/l	5030/8015M	0.050	03/09	03/09	MP
Dilution Factor	1.0		5030/8015M		03/09	03/09	MP
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	96.0	%	5030/8015M	50-150	03/09	03/09	MP
Diesel Range Organics							
DRO	0.15	mg/l	3510/8015M	0.010	02/20	02/20	CAL
Dilution Factor	1.0		3510/8015M		02/20	02/20	CAL
Surrogate Recoveries:							
O-Terphenyl	136	%	3510/8015M	50-150	02/20	02/20	CAL
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Bromoform	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Bromomethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Carbon Tetrachloride	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Chlorobenzene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Chloroethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Chloroform	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Chloromethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Dibromochloromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,2-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,3-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,4-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Dichlorodifluoromethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,1-Dichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,2-Dichloroethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,1-Dichloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Cis-1,2-Dichloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Trans-1,2-Dichloroethene	BDL	ug/l	8010	2.0	02/20	02/20	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 04/07/98
Log #: L28267-10

Sample Description:

Groundwater Analysis
2403C.24

Label: AMW-1
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Cis-1,3-Dichloropropene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Trans-1,3-Dichloropropen	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Methylene Chloride	BDL	ug/l	8010	2.0	02/20	02/20	CAL
1,1,2,2-Tetrachloroethan	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Tetrachloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,1,1-Trichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,1,2-Trichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Trichloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Trichlorofluoromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Vinyl Chloride	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,1,2-trichloro-1,2,2-tr	BDL	ug/l	8010	2.0	02/20	02/20	CAL
Dilution Factor	1.0		8010		02/20	02/20	CAL
Surrogate Recoveries:							
Bromochloromethane	102	%	8010	58-146	02/20	02/20	CAL
Volatile Organic Aromatics							
Benzene	BDL	ug/l	8020	1.0	03/09	03/09	MP
Ethylbenzene	BDL	ug/l	8020	1.0	03/09	03/09	MP
Toluene	BDL	ug/l	8020	1.0	03/09	03/09	MP
Total Xylenes	BDL	ug/l	8020	1.0	03/09	03/09	MP
MTBE	BDL	ug/l	8020	10	03/09	03/09	MP
Dilution Factor	1.0		8020		03/09	03/09	MP
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	102	%	8020	50-150	03/09	03/09	MP
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
2-Methylnaphthalene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
1-Methylnaphthalene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Acenaphthylene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Acenaphthene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Fluorene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Phenanthrene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Anthracene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Pyrene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Benzo(a)anthracene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Chrysene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Benzo(b)fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 04/07/98
Log #: L28267-10

Sample Description:

Groundwater Analysis
2403C.24

Label: AMW-1
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons (continued)							
Benzo(k)fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Benzo(a)pyrene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Dibenzo(a,h)Anthracene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Indeno(1,2,3-c,d)pyrene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Benzo(g,h,i)perylene	BDL	ug/l	3510/8270	1.0	02/20	03/25	GM
Dilution Factor	1.0		3510/8270		02/20	03/25	GM
Surrogate Recoveries:							
Nitrobenzene-d5	60.0	%	3510/8270	35-114	02/20	03/25	GM
2-Fluorobiphenyl	44.0	%	3510/8270	43-116	02/20	03/25	GM
Terphenyl-d14	68.0	%	3510/8270	33-141	02/20	03/25	GM

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G	HRS# E86240,86356	NC CERT# 444
SUB HRS# 86122,86109,E86048	ADEM ID# 40850	ND CERT# R-148
SC CERT# 96031	TN CERT# 02985	CT CERT# PH-0122
ELPAT# 13801	CA CERT# I-1068	USACE CERT
VA CERT# 00395	RI CERT# 191	MA CERT# M-FL449

Respectfully submitted,
C Kegelman
Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 04/07/98
Log #: L28267-11

Sample Description:

Groundwater Analysis
2403C.24

Label: AMW-2
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Gasoline Range Organics							
Gasoline Range Organics	BDL	ug/l	5030/8015M	50	02/24	02/24	CAL
Dilution Factor	1.0		5030/8015M		02/24	02/24	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	107	%	5030/8015M	50-150	02/24	02/24	CAL
Diesel Range Organics							
DRO	0.38	mg/l	3510/8015M	0.010	02/19	02/20	CAL
Dilution Factor	1.0		3510/8015M		02/19	02/20	CAL
Surrogate Recoveries:							
O-Terphenyl	103	%	3510/8015M	50-150	02/19	02/20	CAL
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Bromoform	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Bromomethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Carbon Tetrachloride	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Chlorobenzene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Chloroethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Chloroform	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Chloromethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Dibromochloromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,2-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,3-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,4-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Dichlorodifluoromethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,1-Dichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,2-Dichloroethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,1-Dichloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Cis-1,2-Dichloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Trans-1,2-Dichloroethene	BDL	ug/l	8010	2.0	02/20	02/20	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 04/07/98
Log #: L28267-11

Sample Description:

Groundwater Analysis
2403C.24

Label: AMW-2
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Cis-1,3-Dichloropropene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Trans-1,3-Dichloropropen	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Methylene Chloride	BDL	ug/l	8010	2.0	02/20	02/20	CAL
1,1,2,2-Tetrachloroethan	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Tetrachloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,1,1-Trichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,1,2-Trichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Trichloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Trichlorofluoromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Vinyl Chloride	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,1,2-Trichloro-1,2,2-Tr	BDL	ug/l	8010	2.0	02/20	02/20	CAL
Dilution Factor	1.0		8010		02/20	02/20	CAL
Surrogate Recoveries:							
Bromochloromethane	117	%	8010	76-130	02/20	02/20	CAL
Volatile Organic Aromatics							
Benzene	0.99	ug/l	8020	0.50	02/24	02/24	CAL
Ethylbenzene	BDL	ug/l	8020	0.50	02/24	02/24	CAL
Toluene	BDL	ug/l	8020	0.50	02/24	02/24	CAL
Total Xylenes	BDL	ug/l	8020	0.50	02/24	02/24	CAL
Dilution Factor	1.0		8020		02/24	02/24	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	107	%	8020	50-150	02/24	02/24	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
2-Methylnaphthalene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
1-Methylnaphthalene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Acenaphthylene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Acenaphthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Fluorene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Phenanthrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Anthracene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Pyrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(a)anthracene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Chrysene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(b)fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(k)fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 04/07/98
Log #: L28267-11

Sample Description:

Groundwater Analysis
2403C.24

Label: AMW-2
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons (continued)							
Benzo(a)pyrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Dibenzo(a,h)Anthracene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Indeno(1,2,3-c,d)pyrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(g,h,i)perylene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Dilution Factor	1.0		3510/8270		02/20	04/07	GM
Surrogate Recoveries:							
Nitrobenzene-d5	29.0	%	3510/8270	35-114	02/20	04/07	GM
2-Fluorobiphenyl	33.0	%	3510/8270	43-116	02/20	04/07	GM
Terphenyl-d14	30.0	%	3510/8270	33-141	02/20	04/07	GM

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G
SUB HRS# 86122,86109,E86048
SC CERT# 96031
ELPAT# 13801
VA CERT# 00395
HRS# E86240,86356
ADEM ID# 40850
TN CERT# 02985
CA CERT# I-1068
RI CERT# 191
NC CERT# 444
ND CERT# R-148
CT CERT# PH-0122
USACE CERT
MA CERT# M-FL449

Respectfully submitted,

Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 04/07/98
Log #: L28267-12

Sample Description:

Groundwater Analysis
2403C.24

Label: AMW-3
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Gasoline Range Organics							
Gasoline Range Organics	140	ug/l	5030/8015M	50	02/24	02/24	CAL
Dilution Factor	1.0		5030/8015M		02/24	02/24	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	105	%	5030/8015M	50-150	02/24	02/24	CAL
Diesel Range Organics							
DRO	17	mg/l	3510/8015M	0.20	02/19	02/21	CAL
Dilution Factor	20		3510/8015M		02/19	02/21	CAL
Surrogate Recoveries:							
O-Terphenyl	n/a	%	3510/8015M	50-150	02/19	02/21	CAL
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Bromoform	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Bromomethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Carbon Tetrachloride	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Chlorobenzene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Chloroethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Chloroform	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Chloromethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Dibromochloromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,2-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,3-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,4-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Dichlorodifluoromethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,1-Dichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,2-Dichloroethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,1-Dichloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Cis-1,2-Dichloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Trans-1,2-Dichloroethene	BDL	ug/l	8010	2.0	02/20	02/20	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 04/07/98
Log #: L28267-12

Sample Description:

Groundwater Analysis
2403C.24

Label: AMW-3
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Cis-1,3-Dichloropropene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Trans-1,3-Dichloropropen	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Methylene Chloride	BDL	ug/l	8010	2.0	02/20	02/20	CAL
1,1,2,2-Tetrachloroethan	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Tetrachloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,1,1-Trichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,1,2-Trichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Trichloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Trichlorofluoromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Vinyl Chloride	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,1,2-Trichloro-1,2,2-Tr	BDL	ug/l	8010	2.0	02/20	02/20	CAL
Dilution Factor	1.0		8010		02/20	02/20	CAL
Surrogate Recoveries:							
Bromochloromethane	107	%	8010	76-130	02/20	02/20	CAL
Volatile Organic Aromatics							
Benzene	BDL	ug/l	8020	0.50	02/24	02/24	CAL
Ethylbenzene	BDL	ug/l	8020	0.50	02/24	02/24	CAL
Toluene	BDL	ug/l	8020	0.50	02/24	02/24	CAL
Total Xylenes	BDL	ug/l	8020	0.50	02/24	02/24	CAL
Dilution Factor	1.0		8020		02/24	02/24	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	105	%	8020	50-150	02/24	02/24	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
2-Methylnaphthalene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
1-Methylnaphthalene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Acenaphthylene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Acenaphthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Fluorene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Phenanthrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Anthracene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Pyrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(a)anthracene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Chrysene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(b)fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(k)fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 04/07/98
Log #: L28267-12

Sample Description:

Groundwater Analysis
2403C.24

Label: AMW-3
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons (continued)							
Benzo(a)pyrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Dibenzo(a,h)Anthracene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Indeno(1,2,3-c,d)pyrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(g,h,i)perylene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Dilution Factor	1.0		3510/8270		02/20	04/07	GM
Surrogate Recoveries:							
Nitrobenzene-d5	24.0	%	3510/8270	35-114	02/20	04/07	GM
2-Fluorobiphenyl	29.0	%	3510/8270	43-116	02/20	04/07	GM
Terphenyl-d14	30.0	%	3510/8270	33-141	02/20	04/07	GM

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
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Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G
SUB HRS# 86122,86109,E86048
SC CERT# 96031
ELPAT# 13801
VA CERT# 00395
HRS# E86240,86356
ADEM ID# 40850
TN CERT# 02985
CA CERT# I-1068
RI CERT# 191
NC CERT# 444
ND CERT# R-148
CT CERT# PH-0122
USACE CERT
MA CERT# M-FL449

Respectfully submitted,

Cindy Kegelman
Senior Project Manager

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Page: Page 1 of 3
Date: 04/07/98
Log #: L28267-13

Sample Description:

Groundwater Analysis
2403C.24

Label: MW-1
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Gasoline Range Organics							
Gasoline Range Organics	BDL	ug/l	5030/8015M	50	02/24	02/24	CAL
Dilution Factor	1.0		5030/8015M		02/24	02/24	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	108	%	5030/8015M	50-150	02/24	02/24	CAL
Diesel Range Organics							
DRO	0.36	mg/l	3510/8015M	0.010	02/19	02/20	CAL
Dilution Factor	1.0		3510/8015M		02/19	02/20	CAL
Surrogate Recoveries:							
O-Terphenyl	104	%	3510/8015M	50-150	02/19	02/20	CAL
Volatile Organic Halocarbons							
Bromodichloromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Bromoform	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Bromomethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Carbon Tetrachloride	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Chlorobenzene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Chloroethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Chloroform	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Chloromethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Dibromochloromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,2-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,3-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,4-Dichlorobenzene	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Dichlorodifluoromethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,1-Dichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,2-Dichloroethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,1-Dichloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Cis-1,2-Dichloroethene	5.6	ug/l	8010	0.50	02/20	02/20	CAL
Trans-1,2-Dichloroethene	BDL	ug/l	8010	2.0	02/20	02/20	CAL

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 04/07/98
Log #: L28267-13

Sample Description:

Groundwater Analysis
2403C.24

Label: MW-1
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Volatile Organic Halocarbons (continued)							
1,2-Dichloropropane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Cis-1,3-Dichloropropene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Trans-1,3-Dichloropropen	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Methylene Chloride	BDL	ug/l	8010	2.0	02/20	02/20	CAL
1,1,2,2-Tetrachloroethan	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Tetrachloroethene	2.1	ug/l	8010	0.50	02/20	02/20	CAL
1,1,1-Trichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
1,1,2-Trichloroethane	BDL	ug/l	8010	1.0	02/20	02/20	CAL
Trichloroethene	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Trichlorofluoromethane	BDL	ug/l	8010	0.50	02/20	02/20	CAL
Vinyl Chloride	BDL	ug/l	8010	0.50	02/20	02/20	CAL
1,1,2-Trichloro-1,2,2-Tr	BDL	ug/l	8010	2.0	02/20	02/20	CAL
Dilution Factor	1.0		8010		02/20	02/20	CAL
Surrogate Recoveries:							
Bromochloromethane	107	%	8010	76-130	02/20	02/20	CAL
Volatile Organic Aromatics							
Benzene	BDL	ug/l	8020	0.50	02/24	02/24	CAL
Ethylbenzene	BDL	ug/l	8020	0.50	02/24	02/24	CAL
Toluene	BDL	ug/l	8020	0.50	02/24	02/24	CAL
Total Xylenes	BDL	ug/l	8020	0.50	02/24	02/24	CAL
Dilution Factor	1.0		8020		02/24	02/24	CAL
Surrogate Recoveries:							
a,a,a-Trifluorotoluene	108	%	8020	50-150	02/24	02/24	CAL
Polynuclear Aromatic Hydrocarbons							
Naphthalene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
2-Methylnaphthalene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
1-Methylnaphthalene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Acenaphthylene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Acenaphthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Fluorene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Phenanthrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Anthracene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Pyrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(a)anthracene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Chrysene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(b)fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(k)fluoranthene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM

Client #: CAL-98-031701
Address: Cape Environmental Management
3631 S. Harbor Blvd.; Suite 130
Santa Ana, CA 92704
Bill Millar

Date: 04/07/98
Log #: L28267-13

Sample Description:

Groundwater Analysis
2403C.24

Label: MW-1
Date Sampled: 02/18/98
Time Sampled: 00:00
Date Received: 02/18/98
Collected By: Client

Parameter	Results	Units	Method	Reportable Limit	Extr. Date	Analysis Date	Analyst
Polynuclear Aromatic Hydrocarbons (continued)							
Benzo(a)pyrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Dibenzo(a,h)Anthracene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Indeno(1,2,3-c,d)pyrene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Benzo(g,h,i)perylene	BDL	ug/l	3510/8270	1.0	02/20	04/07	GM
Dilution Factor	1.0		3510/8270		02/20	04/07	GM
Surrogate Recoveries:							
Nitrobenzene-d5	27.0	%	3510/8270	35-114	02/20	04/07	GM
2-Fluorobiphenyl	32.0	%	3510/8270	43-116	02/20	04/07	GM
Terphenyl-d14	30.0	%	3510/8270	33-141	02/20	04/07	GM

BDL = Below Detection Limits
* Compounds are Screened Only, with an estimated detection limit.
All analyses were performed using EPA, ASTM, USGS, or Standard Methods.
All analyses were performed within EPA holding times unless otherwise noted.
Analyses are reported in dry weight unless otherwise indicated by units.

QAP# 900376G
SUB HRS# 86122,86109,E86048
SC CERT# 96031
ELPAT# 13801
VA CERT# 00395
HRS# E86240,86356
ADEM ID# 40850
TN CERT# 02985
CA CERT# I-1068
RI CERT# 191
NC CERT# 444
ND CERT# R-148
CT CERT# PH-0122
USACE CERT
MA CERT# M-FL449

Respectfully submitted,
C Kegelman
Cindy Kegelman
Senior Project Manager

VOC Analytical Laboratories

1212 E. KATELLA AVE
ANAHEIM, CA 92805

1085 SHARY CIRCLE
CONCORD, CA 94518

801 WESTERN AVE.
GLENDALE, CA 91201

4411 S. BROADWAY Ste. D-1
PHOENIX, AZ 85040

V.O.C. Log # L28267

Chain of Custody Record 9802359

Quote # _____

Company Name CAPE ENVIRONMENTAL

Address 3631 S. HARBOR BLVD, STE 130

City SANTA ANA State CA Zip 92704

Attn: BILL MILLAR Fax # 714/427-6161

Project Name / Number 2403C.24 PO# 2403C.24

Sampler Name / Signature _____ Phone # 714/427-6160

LAB ANALYSIS

#	Sample Label (Client ID)	Collected Date	Collected Time	Matrix Code*	#of Cont	Parameters	Sample	pH	Pres Codes	8020 BTEX	8015 d & g	8010 CHLORINATED HYDROCARBONS	OIL & GREASE 5520	8270 8310 PAH's	Field Filtered (Y/N)	Integrity OK (Y/N)	REMARKS
1	AMW-2-5'	2-16-98	1030	SO	1					X	X	X	X	X			
2	AMW-2-10'		1037							X	X	X	X	X			
3	AMW-2-15'		1045							X	X	X	X	X			
4	AMW-3-5'		1220							X	X	X	X	X			
5	AMW-3-10'		1228							X	X	X	X	X			
6	AMW-3-15'		1235							X	X	X	X	X			
7	AB-1-5'		1500							X	X	X	X	X			
8	AB-1-10'		1505							X	X	X	X	X			
9	AB-1-15'		1515							X	X	X	X	X			
10	AMW-1	2-18-98		GW	4					X	X	X	X	X			

Matrix Codes *

SD	Solid Waste	OL	Oil
GW	Ground Water	SL	Sludge
EFF	Effluent	SO	Soil Sediment
AFW	Analyte Free H_2O	AQ	Aqueous
WW	Waste Water	NA	Nonaqueous
DW	Drinking Water	PE	Petroleum
SU	Surface Water	O	Other (Please Specify)

Pres Codes

A- None	E- HCl
B- HNO_3	F- MeOH
C- H_2SO_4	I- Ice
D- NaOH	O- Other

Short Hold Y ___ N ___

Ice Y ___ N ___

QA/QC Report Level None ___ 1 ___ 2 ___ 3 ___ Other ___

C.A.T. Request ___ RUSH ___ Custody Seals Y N

COC OK Y N | Initials

Temp Control ___°C | Local Job Y N

Item	Relinquished by	Date	Time	Received by	Date	Time
	[signature]	2-18-98	11:52	Marina Mackey	2/18/98	11:52
	Marina Mackey	2/18/98	1730	[signature]	2/19/98	830

C.O.C. # 1006347

ORIGINAL

VOC Analytical Laboratories

❑ 1212 E. KATELLA AVE
ANAHEIM, CA 92805

❑ 801 WESTERN AVE.
GLENDALE, CA 91201

❑ 1085 SHARY CIRCLE
CONCORD, CA 94518

❑ 4411 S. BROADWAY Ste. D-1
PHOENIX, AZ 85040

Chain of Custody Record

V.O.C. Log # _____

Quote # _____

Company Name CAPE

Address 2621 S. HARBOR BLVD

City SANTA ANA State CA Zip 92704

Attn: ZIC MILLAR Fax # 714/427-6161

Project Name / Number 24OPC 24 PO# 24030.24

Sampler Name / Signature _____ Phone # 714/427-6160

#	Sample Label (Client ID)	Collected Date	Collected Time	Matrix Code*	# of Cont.
1	AMW-2	2-18-98		GW	4
2	AMW-3	↓		↓	↓
3	MW-1	↓		↓	↓
4					
5					
6					
7					
8					
9					
10					

LAB ANALYSIS

Parameters	Sample pH	Pres Codes	602 BTEX	8015 (GAS & D)	8010	5520 O&G	8270 PNA's	Field Filtered (Y/N)	Integrity OK (Y/N)
1			X	X	X	X	X		
2			X	X	X	X	X		
3			X	X	X	X	X		
4									
5									
6									
7									
8									
9									
10									

Matrix Codes *

SD	Solid Waste	OL	Oil
GW	Ground Water	SL	Sludge
EFF	Effluent	SO	Soil Sediment
AFW	Analyte Free H_2O	AQ	Aqueous
WW	Waste Water	NA	Nonaqueous
DW	Drinking Water	PE	Petroleum
SU	Surface Water	O	Other _____ (Please Specify)

Pres Codes

A- None	E- HCl
B- HNO_3	F- MeOH
C- H_2SO_4	I- Ice
D- NaOH	O- Other

REMARKS

CLIENT COPY

Short Hold Y____ N____

Y____ Ice N____

QA/QC Report Level None____ 1____ 2____ 3____ Other____

COC OK Y N | Initials

T.A.T. Request: Standard

RUSH: Date required

Custody Seals Y N

Temp Control ____°C

Local Job Y N

Item	Relinquished by	Date	Time	Received by	Date	Time
	[signature]	2-18-98	11:52	[signature]	2/18/98	11:52

C.O.C. # 1006346

APPENDIX F

MONITORING WELL SURVEY DATA

RON ARCHER

CIVIL ENGINEER INC.

CONSULTING • PLANNING • DESIGN • SURVEYING

4133 Mohr Ave., Suite E • Pleasanton, CA 94566
(510) 462-9372

Post-it® Fax Note 7671	Date 2-25-98	# of pages ▶
To BILL MULLER	From RON ARCHER	
Co./Dept. CAPE ENV.	Co.	
Phone #	Phone # 510 462-9372	
Fax # 714 927-6161	Fax # 510 462-4454	

MAY 15, 1995 JOB NO 2289.1
*REVISED: FEBRUARY 17, 1998

ELEVATIONS OF ADDITIONAL WELLS AT THE FEDERAL CENTER LOCATED AT 620 CENTRAL AVENUE AT MCKAY AVENUE, CITY OF ALAMEDA, CA

FOR: ***CAPE ENVIRONMENTAL MANAGEMENT INC.***

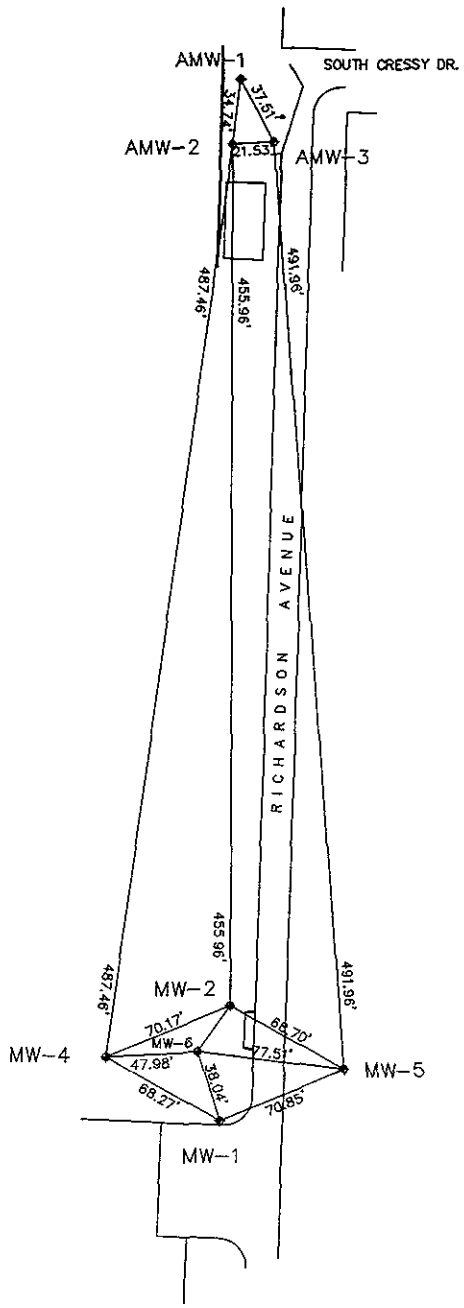
BENCHMARK:

A FOUND U.S.C. & G.S. BRONZE DISK STAMPED CENT-SIXTH, 1947 SET IN A STANDARD CITY MONUMENT CASING, 12 INCHES BELOW THE SIDEWALK SURFACE AT THE NORTHWEST CORNER OF THE INTERSECTION OF 6TH STREET AND CENTRAL AVENUE. ELEVATION TAKEN AS 16.792 MEAN SEA LEVEL.

MONITORING WELL DATA TABLE

WELL DESIGNATION	TOP OF CASING ELEVATION	TOP OF BOX ELEVATION
MW-1	8.19	8.85
MW-2	8.27	8.73
MW-3	9.00	9.24
MW-4	8.63	8.73
MW-5	8.37	8.73
MW-6	8.61	8.75
*AMW-1	8.73	8.96
*AMW-2	8.84	9.17
*AMW-3	8.83	8.85

SCALE 1" = 100'



GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

1 inch = 100 ft

RON ARCHER CIVIL ENGINEER INC * 4 33 MOHR AVE SUITE E * PLEASANTON CA 94566	DATE 02-25-98	JOB NO 2289-A