

APR 16 2001

**Groundwater Monitoring Results
First through Fourth Quarter 2000
Cargill Salt - Alameda Facility
Alameda, California**

Apr 2001

CARGILL SALT

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April 11, 2001

Alameda County Dept. of Environmental Health
Hazardous Materials Division
1131 Harbor Bay Parkway
Alameda, California 94502-6577
Attn: eva chu

**RE: Groundwater Monitoring Results, First through Fourth Quarter 2000
Cargill Salt – Alameda Facility, Alameda, California**

Results of groundwater transect sampling and the initial sampling of groundwater monitoring wells installed in November 1999 were reported in the January 31, 2000 submittal, "Groundwater Characterization and Monitoring Well Installation" prepared by Crawford Consulting, Inc. and Conor Pacific/EFW. The monitoring wells were installed to help characterize and monitor the occurrence of volatile organic compounds, primarily tetrachloroethene (PCE) and its breakdown product, trichloroethene (TCE), in groundwater at the site.

Since the initial groundwater monitoring well sampling event, four additional quarters of groundwater monitoring data have been collected. These data generally confirm the results of the transect sampling and initial sampling of the monitoring wells.

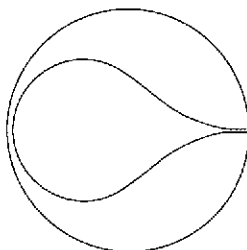
Using the results of the transect sampling and the five quarters of groundwater monitoring data, a workplan for additional off-site delineation will be developed and submitted for your review before implementation.

The attached report presents the groundwater monitoring results for First through Fourth Quarter 2000 for the Cargill Salt Alameda facility. To the best of my knowledge the attached report is true, complete, and correct. Should you have any questions concerning the report, please don't hesitate to call.

Sincerely,



Barbara N. Ransom
Environmental Affairs Manager



**Groundwater Monitoring Results
First through Fourth Quarter 2000
Cargill Salt - Alameda Facility
Alameda, California**

Prepared for:

**Cargill Salt
7220 Central Avenue
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Prepared by:

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**Project No. CS1605
April 11, 2001**

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1 Introduction

Crawford Consulting, Inc. (CCI) has prepared this report on behalf of Cargill Salt for the Cargill Salt Dispensing Systems Division facility (hereafter, the Site) in Alameda, California.

Results of groundwater transect sampling and the initial sampling of groundwater monitoring wells installed in November 1999 were presented in the January 31, 2000 report, *Groundwater Characterization and Monitoring Well Installation, Cargill Salt – Alameda Facility, Alameda, California* (Crawford Consulting, Inc. and Conor Pacific/EFW). The groundwater transect sampling and the monitoring wells installation and sampling were performed to help characterize and monitor the occurrence of volatile organic compounds (VOCs), primarily tetrachloroethene (PCE) and its breakdown product, trichloroethene (TCE), previously detected in groundwater at the Site.

One of the recommendations in the report was to confirm the groundwater analytical results of the newly installed monitoring wells (wells MW-1, MW-2, and MW-3) and the groundwater flow direction and gradient via quarterly monitoring. Since the initial groundwater monitoring well sampling event, four additional quarters of groundwater monitoring data have been collected. These data are presented in this report. Background information and a summary of the reporting period activities are presented below.

1.1 Background Information

A description of the Site and a summary of the development of characterization and monitoring programs for the Site are presented in this section.

1.1.1 Site Description

Alameda is an island on the east side of San Francisco Bay, separated from Oakland by a tidal canal (Figure 1). The Cargill Salt Dispensing Systems Division facility is located on a rectangular lot in an industrial and residential neighborhood. The facility building occupies approximately one-third of the site and is separated from the vacant, unpaved side of the lot by an asphalt driveway (Figures 2 and 3). The site is bordered by a sheet-metal shop and a residential lot to the northwest, an apartment complex to the southwest, and a residential lot to the southeast.

From 1951 to 1978, the Alameda facility produced salt-dispensing units, which required casting and milling aluminum parts. Casting now occurs off site; the facility still mills and repairs salt-dispensing units.

Constituents of concern associated with site operations have included casting sands with elevated concentrations of metals, and solvents, machine oils, and grease used in casting and milling operations. As discussed below, previous investigations and remedial activities have investigated and remediated metals and solvents (VOCs) in vadose-zone soil.

1.1.2 Summary of Investigative and Remedial Activities

Cargill Salt initiated site investigative activities in 1993 to determine if facility operations had impacted site soils. Cargill Salt submitted the results of the soil sampling investigation to the Alameda County Environmental Health Services (ACEHS) in October 1993 along with a workplan for excavation and disposal of impacted soils and assessment of potential impact to groundwater (Groundworks Environmental, Inc. [Groundworks], 1993).

After approval of the workplan by ACEHS, Cargill Salt conducted several phases of soil remediation and groundwater characterization. Surficial soils impacted by metals were excavated for disposal off site. Vadose-zone soils with the highest degree of impact by VOCs were also excavated for off-site disposal (see "Soil excavation area" on Figure 2).

The results of these activities were submitted to the ACEHS in a report, *Soil and Groundwater Investigations and Remedial Activities, July 1993 - September 1994, Cargill Salt - Alameda Facility, Alameda, California* (Groundworks, 1995). PCE concentrations detected in groundwater in 1993 and 1994 are shown on Figure 2. The approximate direction of groundwater flow determined in temporary borings is also shown on Figure 2. Recommendations for additional work to further delineate the lateral and vertical extent of VOCs in groundwater beneath the site were presented in the report.

A workplan for the additional delineation of VOCs in groundwater, *Workplan for Groundwater Characterization and Monitoring Well Installation, 2016 Clement Avenue, Alameda, California* (CCI), was submitted to the ACEHS in July 1999.

After approval of the workplan by the ACEHS, Cargill Salt conducted groundwater sampling and well installation activities during August and November of 1999. The results of these activities were submitted to the ACEHS in a report, *Groundwater Characterization and Monitoring Well Installation, Cargill Salt - Alameda Facility, Alameda, California* (Crawford Consulting, Inc. and Conor Pacific/EFW, dated January 31, 2000). The groundwater transect sampling and monitoring well locations are shown on Figure 3. PCE and TCE concentrations detected the transects are shown on Figures 4 and 5, respectively. The concentrations of VOCs detected in the November 1999 sampling event are shown on Figure 6.

1.1.3 Source of VOC Impact

As discussed in the 1995 report, the occurrence of VOCs in soils and groundwater at the site appears to be the result of a discharge or spill to surficial soils at a location near the rear property line at the southwestern corner of the property. The area with the highest degree of chemical impact was delineated prior to excavation and was then excavated using a backhoe and transported off-site for appropriate disposal. It is possible that the VOCs detected in soils and groundwater at this location were associated with waste products from facility operations. The VOCs may be associated with solvents previously used for degreasing operations at the facility, although there are no records indicating use of PCE. Site records indicate that the solvents used for degreasing operations were not PCE-based solvents.

It is also possible that the VOCs and oil and grease are associated with waste products discarded from neighboring properties. There is an apartment complex next to the rear property line of the facility, and the laundry room for this complex is in the utility shed immediately adjacent to the rear property line. This laundry room is only 4 feet away from the area of highest impact to soil. If PCE associated with laundry cleaning products were spilled in this laundry room, it is possible that it could have

drained onto the Cargill Salt property. Also, site personnel have reported that the residential neighbor to the northwest owns a dry cleaning business that could be a potential source for PCE.

1.2 Reporting Period Activities

Three groundwater monitoring wells (MW-1, MW-2, and MW-3) were installed, sampled, and analyzed in November 1999 as part of a remedial investigation at the Site.

Since the initial sampling and analysis event in November 1999, four quarters of groundwater monitoring data have been collected. Groundwater levels in the Site monitoring wells were measured, groundwater samples were collected and analyzed, and the groundwater flow direction and gradient were determined. This report presents the results of groundwater monitoring data collected during the first through fourth quarters of 2000.

The quarterly monitoring schedule is shown below.

Quarter of 2000	Field Date
First	March 30, 2000
Second	May 16, 2000
Third	July 28, 2000
Fourth	November 30, 2000

Supervision of the quarterly monitoring events were conducted for Cargill Salt by CCI. Groundwater level measurements and collection of groundwater samples were conducted by Field Solutions, Inc. The groundwater samples for the first through third quarters of 2000 were analyzed by Columbia Analytical Services, Inc. (CAS), a state-certified laboratory in Santa Clara, California. The groundwater samples for the fourth quarter of 2000 were analyzed by Curtis & Tompkins, Ltd., a state-certified laboratory in Berkeley, California.

2 Groundwater Flow Analysis

Groundwater levels were measured and groundwater contour maps were prepared for the first through fourth quarter 2000 reporting period.

2.1 Water-Level Measurement

Water levels in groundwater monitoring wells (MW-1, MW-2, and MW-3) were measured each quarter, before any of the groundwater monitoring wells were purged for sampling for the quarterly monitoring event. The groundwater monitoring well locations are shown on Figure 2. The water levels were measured with an electric sounder. The depth to water at each well was recorded on a *Water Level Field Data* sheet (see Appendix A).

The water-level data through the fourth quarter of 2000 are shown on Table 1. The data in Table 1 include the date and time of measurement, the well casing elevation, the measured depth to groundwater, the groundwater elevation, and the change in elevation from the previous measurement.

Between the November 1999 and the first quarter 2000 (March 30, 2000) measurements, the groundwater levels rose 0.94 to 2.42 feet, reflecting winter-season recharge. During the remaining quarters of 2000, the water levels fell or stayed approximately the same, reflecting dissipation of the winter-season recharge.

2.2 Groundwater Flow Direction and Gradient

Groundwater contour maps for the fourth quarter of 1999 and the first through fourth quarters of 2000 based on the November 1999 and March, May, July, and November 2000 water-level data are shown on Figures 7 through 11.

The groundwater flow direction determined for each quarter of 2000 was to the northeast, consistent with the groundwater flow direction determined in November 1999 and in September 1994.

The horizontal hydraulic gradients measured for the first, second, third, and fourth quarters of 2000 were 0.025, 0.018, 0.015, and 0.014, respectively.

3 Groundwater Sampling and Analysis

This section summarizes the sample collection and analytical methods, presents an evaluation of quality control data, and summarizes the results of the sampling events.

3.1 Sample Collection and Analysis

Groundwater samples were collected March 30, May 16, July 28, and November 30, 2000 from groundwater monitoring wells MW-1, MW-2, and MW-3. Prior to the first quarter 2000 sampling event, dedicated tubing was installed in each well to facilitate sampling with a peristaltic pump. Dedicated fluorinated ethylene propylene resin (FEP) lined polyethylene tubing was installed in each monitoring well. The tubing intake was placed about one foot above the well bottom in each of the wells. Viton dedicated check valves were installed on the tubing intakes to prevent back-flow of water into the well. A short length of dedicated Viton tubing was installed at the well head for use in a peristaltic pumphead. Prior to sample collection for each quarterly monitoring event, the wells were purged using a peristaltic pump. Field parameters (pH, electrical conductivity, temperature, and turbidity) were measured in purged groundwater from each well prior to sampling; these data are recorded on the Sample Collection Field Data sheets presented in Appendix A. After purging, groundwater samples were collected using the peristaltic pump and the dedicated Viton pumphead discharge tubing.

The groundwater samples were analyzed for VOCs using U.S. Environmental Protection Agency (USEPA) Method 8260. Results for all Method 8010 analytes were reported. The groundwater samples for first through third quarter 2000 were delivered with appropriate chain-of-custody documentation to Columbia Analytical Services, Inc., a state-certified laboratory in Santa Clara, California, for chemical analysis. The groundwater samples for fourth quarter 2000 were delivered with appropriate chain-of-custody documentation to Curtis & Tompkins, Ltd., a state-certified laboratory in Berkeley, California, for chemical analysis.

3.2 Analytical Results

The results of field and laboratory quality control measures and the results of the groundwater monitoring well samples are reviewed in this section. The certified analytical reports and chain-of-custody documentation are presented in Appendix B.

3.2.1 Quality Control

Quality control (QC) samples were analyzed as part of the sampling and analysis program to evaluate the precision and accuracy of the reported groundwater chemistry data. QC samples included both field and laboratory samples. Descriptions of the purpose of specific field and laboratory QC samples used during the sampling and analysis program and an evaluation of field and laboratory QC results are presented below.

Field Quality Control Samples

An equipment blank was used during the first quarter 2000 sampling program for the Site as a field QC sample. An equipment blank (or rinsate blank) is a sample of analyte-free water used to rinse the sampling equipment (i.e., the FEP-lined polyethylene tubing). An equipment blank, which can be collected prior to or during the sampling event, is used to document that adequate cleaning of the equipment has been achieved. During the first quarter 2000 sampling program, de-ionized water prepared by the laboratory was pumped through the dedicated tubing and check valve to be installed in monitoring well MW-1 and collected from the peristaltic pump discharge. The equipment blank was collected prior to dedicating the tubing to well MW-1.

A field duplicate was used during the second through fourth quarter 2000 sampling program for the site. A field duplicate is used to assess sampling and analytical precision. The duplicate is collected at a selected well (MW-1) and then submitted "blind" to the laboratory for analysis with the same batch as the regular sample for the selected well. An estimate of precision is obtained by calculating the relative percent difference (RPD) between the regular sample and the duplicate sample using the following formula:

$$\text{RPD} = \frac{[x - y] 100}{0.5 (x + y)}$$

where: $[x - y]$ = the absolute value of the difference in concentration between the regular sample (x) and the duplicate sample (y).

Laboratory Quality Control Samples

The following types of laboratory QC samples were used during the first through fourth quarter 2000 analytical program for the Site:

- surrogate spikes
- matrix spikes/duplicate matrix spikes

A surrogate spike is a check standard added to a sample in a known amount prior to analysis. Surrogate spikes consist of analytes not normally found in environmental samples and not targeted by the analytical procedure. Surrogate spikes provide information on recovery efficiency by comparing the percent recovery of specific surrogate analyses to statistically derived acceptance limits developed by the USEPA or the laboratory (provided such laboratory-specific limits are stricter than those developed by the USEPA). If the recoveries fall within the acceptance limits for the analytes, the analysis exhibits an acceptable recovery efficiency. Recoveries that fall outside the acceptance limits indicate a potential problem with the recovery efficiency of analytes, which in turn indicates a potential bias with respect to the reported concentration of the environmental samples analyzed in the same batch.

Matrix spikes and duplicate matrix spikes are analyzed by the laboratory for the purpose of providing a quantitative measure of accuracy and precision, and to document the effect that the sample matrix has on the analysis. A selected sample is spiked in duplicate with known concentrations of analytes. The recoveries of the spiked analytes are compared to statistically derived acceptance limits developed by the USEPA or the laboratory (provided such laboratory-specific limits are stricter than those developed by the USEPA). If the recoveries fall within the acceptance limits for the analytes, the analysis has no statistically significant bias (i.e., the analysis is accurate). Recoveries that fall outside

of the acceptance limits have a positive or negative bias, depending on whether the recovery is greater or less than the upper or lower acceptance limit, respectively. Analyses where analyte recoveries fall outside the acceptance limits should be regarded as estimates only.

Precision for matrix spikes is measured by calculating the relative percent differences (RPDs) between the measured concentration of analytes in the matrix and the duplicate matrix spike. The following equation is used for matrix spikes:

$$\text{RPD} = \frac{[\text{MS} - \text{MSD}] 100}{0.5 (\text{MS} + \text{MSD})}$$

where: [MS - MSD] = the absolute value of the difference in concentration between the matrix spike (MS) and the matrix spike duplicate (MSD)

First Quarter 2000 Field QC Results

One equipment blank (EB-1) was analyzed as part of the first quarter 2000 sampling event at the Site. The blank sample was analyzed for halogenated VOCs using USEPA Method 8260 (8010 list). No VOCs were detected in the equipment blank collected from the dedicated sample tubing for well MW-1, with the exception of chloroform (a common laboratory contaminant) at a concentration of 0.6 micrograms per liter ($\mu\text{g/L}$). Chloroform was detected at a concentration of 0.6 $\mu\text{g/L}$ in the groundwater sample from well MW-1. However, this detection could be attributed to cross-contamination from the sampling container and preservative, or contamination introduced during sample collection, sample transport and storage, sample preparation, and sample analysis, and indicates that chloroform may not be present in groundwater at well MW-1.

Second Quarter 2000 Field QC Results

One field duplicate (DUP-1) was analyzed as part of the second quarter 2000 sampling event at the Site. The duplicate sample was collected at groundwater monitoring well MW-1 and was analyzed for halogenated VOCs using USEPA Method 8260 (8010 list). Table 3 summarizes the calculated RPDs for MW-1 and MW-1 duplicate (DUP-1). Of the two parameters for which RPDs could be calculated (see Table 3), one parameter (Trichloroethene) exhibits a moderate RPD value (i.e., between 10% and 25%) indicative of fair precision, and one parameter (Tetrachloroethene) exhibits a high RPD value (> 25%) indicative of relatively poor precision. The second quarter 2000 results for the parameters exhibiting relatively poor precision should be viewed with caution if they appear anomalous with respect to previous or subsequent monitoring results.

Third Quarter 2000 Field QC Results

One duplicate sample (DUP-1) was analyzed as part of the third quarter 2000 sampling event at the Site. The blank sample was collected at groundwater monitoring well MW-1 and was analyzed for halogenated VOCs using USEPA Method 8260 (8010 list). Table 3 summarizes the calculated RPDs for MW-1 and MW-1 duplicate (DUP-1). Of the three parameters for which RPDs could be calculated (see Table 3), three parameters (1,1-Dichloroethene, Trichloroethene, and Tetrachloroethene) exhibit low RPD values (i.e., less than 10%) indicative of good precision.

Fourth Quarter 2000 Field QC Results

One duplicate sample (DUP-1) was analyzed as part of the fourth quarter 2000 sampling event at the Site. The blank sample was collected at groundwater monitoring well MW-1 and was analyzed for halogenated VOCs using USEPA Method 8260 (8010 list). Table 3 summarizes the calculated RPDs for MW-1 and MW-1 duplicate (DUP-1). Of the three parameters for which RPDs could be calculated (see Table 3), two parameters (Trichloroethene and Tetrachloroethene) exhibit low RPD values (i.e., less than 10%) indicative of good precision, and one parameter (1,1-Dichloroethene) exhibits a moderate RPD value (between 10% and 25%) indicative of fair precision.

First through Fourth Quarter 2000 Laboratory QC Results

A review of the first through fourth quarter 2000 field data sheets and laboratory reports (presented in Appendices A and B, respectively) indicates that all analyses were performed within USEPA or California Department of Health Services (DHS) recommended maximum sample holding times.

QC data on surrogate spike recoveries and matrix spike recoveries are presented in the laboratory reports. These data indicate: (1) no surrogate spike recoveries were outside of the laboratory's acceptance limits; (2) no matrix spike or duplicate matrix spike recoveries were outside of the laboratory's control limits; and (3) RPD values for the matrix spikes and duplicate matrix spikes indicate a high overall degree of analytical precision. The laboratory QC data indicate that the results reported herein are of adequate quality for evaluation of site groundwater conditions.

3.2.2 Groundwater Results

The results of VOC analyses for each quarter of 2000 are summarized in Table 2, which also shows the VOC results for the initial sampling event for monitoring wells MW-1, MW-2, and MW-3 in November 1999.

Similar to previous characterization and monitoring results, PCE and its breakdown product TCE were the predominant VOCs detected in groundwater at the Site during the first through fourth quarters of 2000. A third breakdown product of PCE, 1,1-DCE, was detected at low concentrations at well MW-1.

For the first through fourth quarters of 2000, the concentrations of PCE detected ranged from 880 to 1,900 $\mu\text{g/L}$ in monitoring well MW-1 and from 1,700 to 3,600 $\mu\text{g/L}$ in MW-2. PCE was only detected at MW-3 during one quarter, at a concentration of 0.8 $\mu\text{g/L}$.

The concentrations of TCE detected ranged from 130 to 190 $\mu\text{g/L}$ in monitoring well MW-1 and from 20 to 53 $\mu\text{g/L}$ in MW-2. TCE was not detected at MW-3.

The concentrations of DCE detected ranged from 13 to 15 $\mu\text{g/L}$ in monitoring well MW-1. DCE was not detected at MW-2 or MW-3.

Also, several parameters were detected at low concentrations in monitoring well MW-1 during the first quarter 2000 sampling event that were not detected in November 1999 and then were not detected in subsequent quarters (see Table 2). However, this seems to be primarily an artifact of the variations in the detection limits reported by the laboratory: detection limits for these parameters were higher for other quarters than for the first quarter of 2000. CCI will coordinate with the lab to try to obtain consistent detection limits for subsequent sampling events.

3.3 Discussion

The results for the year 2000 quarterly monitoring events are generally similar to the results reported for the initial sampling of monitoring wells MW-1, MW-2, and MW-3 after installation in November 1999, with some exceptions. The concentrations of PCE reported for wells MW-1 and MW-2 in the first quarter of 2000 were higher than the concentrations reported for November 1999. This rise in concentrations correlates with a rise in groundwater elevation at the site. After the first quarter, PCE concentrations generally fell, corresponding with a fall in groundwater levels at the Site.

The groundwater transect sampling completed in 1999 and the results of quarterly monitoring have identified the location of the core of the VOC plume at the site (see Figures 4 - 6). Upgradient, the core of the plume, consisting primarily of PCE, is close to the northwestern property fence. Downgradient, the core of the VOC plume is seen at a greater depth to the northeast, reflecting the local groundwater flow direction. The eastern edge of the plume has been delineated within the property boundary. The western edge and the downgradient edge of the plume appear to be located off-site to the west and northeast of the property, respectively. PCE was detected at an off-site probe location AP-3, approximately 40 feet downgradient of the property boundary, in 1994 (see Figure 2).

However, as discussed in the 1995 Groundworks report, a VOC was detected (trichlorotrifluoromethane [CFC 11] at $32 \mu\text{g/L}$) at downgradient probe location AP-4c that was not detected in on-site soil or groundwater. Detection of VOCs in groundwater downgradient of the site that were not detected in either soil or groundwater on site may indicate that PCE and other VOCs detected downgradient of the site may be related to off-site sources. Sewer lines and utility trenches beneath Clement Avenue may be a potential source for these VOCs.

The concentrations of PCE detected in groundwater samples from MW-1 and MW-2 exceed California's primary drinking water standard for PCE, which is $5 \mu\text{g/L}$. The concentrations of TCE detected in groundwater samples from MW-1 and MW-2 exceed California's primary drinking water standard for TCE, which is also $5 \mu\text{g/L}$. To date, concentrations of PCE and TCE exceeding Primary drinking water standards have only been detected at on-site locations.

Although primary drinking water standards are exceeded in on-site groundwater, shallow groundwater in the vicinity of the site is not considered to be suitable as a source of drinking water (Groundworks, 1995; Hickenbottom and Muir, 1988).

4 Recommendations

One of the recommendations of the January 2000 report by CCI and Conor Pacific, *Groundwater Characterization and Monitoring Well Installation*, was to confirm the groundwater analytical results of the newly installed monitoring wells and the groundwater flow direction and gradient through quarterly monitoring. The results of four quarters of subsequent monitoring confirm the general findings of groundwater characterization and monitoring presented in the January 2000 report.

The additional recommendations presented in the report should be considered at this time. These recommendations are shown below.

- If possible, further delineate the extent of VOCs in groundwater offsite, particularly near the fence line to the northwest and downgradient across Clement Avenue. The possibility of further delineation will depend on whether access will be restricted.
- Investigate whether sewer lines and other utilities beneath Clement Avenue will be possible conduits or pathways for migration of VOCs in groundwater, and evaluate other possible off-site sources of VOCs detected downgradient of the site.
- Collect hydraulic information (e.g., transmissivity) and natural attenuation information as part of evaluating the fate and transport of VOCs in the subsurface and the associated risk.
- Evaluate potential corrective action alternatives for the site.

A workplan for conducting additional off-site delineation and other tasks recommended above will be submitted for review by ACEHS before implementation.

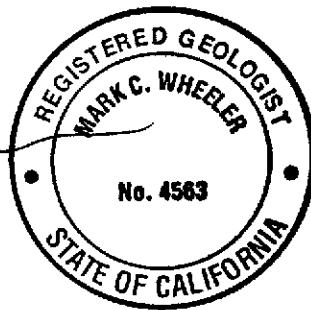
Professional Certification

**Groundwater Monitoring Results
First through Fourth Quarter 2000
Cargill Salt - Alameda Facility
Alameda, California**

This report has been prepared by CRAWFORD CONSULTING, INC.

under the direct supervision of:

Mark C. Wheeler



Mark C. Wheeler
Principal Geologist
R.G. 4563

References

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- Hickenbottom, K. S., and Muir, K.S., 1988. *Geohydrology and Groundwater-Quality Overview of the East Bay Plain Area, Alameda County, California, 205 (j) Report*, prepared for the California Regional Water Quality Control Board, San Francisco Bay Region, by the Alameda County Flood Control and Water Conservation District, June 1988.

Limitations

This report and the evaluations presented herein have been prepared in accordance with generally accepted professional standards and is based solely on the scope of work and services described herein. This report has been prepared solely for the use of Cargill Salt for the purposes noted herein. Any use of this report, in whole or in part, by a third party for other than the purposes noted herein is at such party's sole risk.

Table 1. Groundwater Level Data

Well/ Piezometer	Date	Time	Casing Elevation (feet, MSL)	Depth to Water (feet)	Water Elevation (feet, MSL)	Elev. Change from Last Measurement
MW-1	11/16/1999	09:56	6.75	3.75	3.00	NA
MW-1	3/30/2000	10:09	6.75	2.81	3.94	0.94
MW-1	5/16/2000	09:43	6.75	3.32	3.43	-0.51
MW-1	7/28/2000	09:11	6.75	3.58	3.17	-0.26
MW-1	11/30/2000	08:36	6.75	3.52	3.23	0.06
MW-2	11/16/1999	11:15	9.81	5.22	4.59	NA
MW-2	3/30/2000	10:05	9.81	2.80	7.01	2.42
MW-2	5/16/2000	09:35	9.81	4.13	5.68	-1.33
MW-2	7/28/2000	09:17	9.81	4.85	4.96	-0.72
MW-2	11/30/2000	08:32	9.81	4.75	5.06	0.10
MW-3	11/16/1999	15:43	6.92	4.34	2.58	NA
MW-3	3/30/2000	10:01	6.92	2.77	4.15	1.57
MW-3	5/16/2000	09:46	6.92	3.44	3.48	-0.67
MW-3	7/28/2000	09:05	6.92	3.72	3.20	-0.28
MW-3	11/30/2000	08:34	6.92	3.73	3.19	-0.01

Key:

NA = Not available

feet, MSL = feet, relative to Mean Sea Level

Table 2. Summary of Groundwater Monitoring Well Data
(results measured in $\mu\text{g/L}$)

Well No. Field Date	MW-1					MW-2					MW-3					MCL ¹
	11/16/99	3/30/00	5/16/00	7/28/00	11/30/00	11/16/99	3/30/00	5/16/00	7/28/00	11/30/00	11/16/99	3/30/00	5/16/00	7/28/00	11/30/00	
DCE ²	<50.0	13	<10	15	14	<50.0	<0.5	<25	<25	<8.3	<0.500	<0.5	<0.5	<0.5	<0.5	6
CFC 113 ³	na ⁴	1.4	<10	<10	<8.3	na	<0.5	<25	<25	<17	na	<0.5	<0.5	<0.5	<1.0	ne ⁵
DCA ⁶	<50.0	0.8	<10	<10	<4.2	<50.0	<0.5	<25	<25	<8.3	<0.500	<0.5	<0.5	<0.5	<0.5	5
Chloroform	<50.0	0.6*	<10	<10	<8.3	<50.0	<0.5	<25	<25	<17	<0.500	<0.5	<0.5	<0.5	<1.0	ne
TCA ⁷	<50.0	1.6	<10	<10	<4.2	<50.0	5.0	<25	<25	<8.3	<0.500	<0.5	<0.5	<0.5	<0.5	200
TCE ⁸	178	150	190	170	130	<50	29	53	<25	20	<0.500	<0.5	<0.5	<0.5	<0.5	5
PCE ⁹	906	1,400	1,900	1,200	880	840	3,600	3,200	3,300	1,700	<0.500	<0.5	<0.5	0.8	<0.5	5
All other Method 8010 analytes	nd ¹⁰	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Notes:

¹ MCL = California Primary Drinking Water Standard - Maximum Contaminant Level (in micrograms per liter [$\mu\text{g/L}$])

² DCE = 1,1-Dichloroethene

³ CFC 113 = Trichlorotrifluoroethane

⁴ na = not analyzed

⁵ ne = not established or none applicable

⁶ DCA = 1,1-Dichloroethane

⁷ TCA = 1,1,1-Trichloroethane

⁸ TCE = Trichloroethene

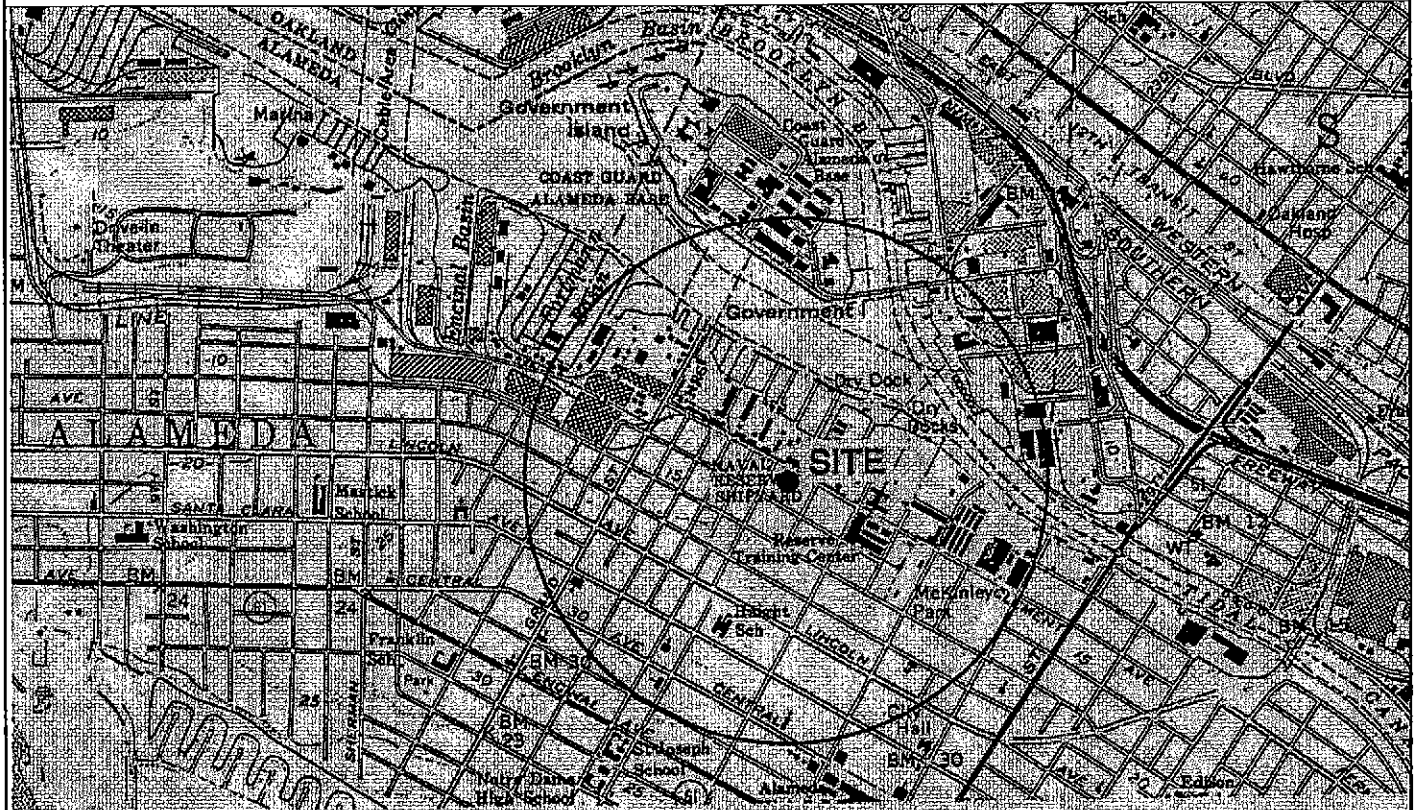
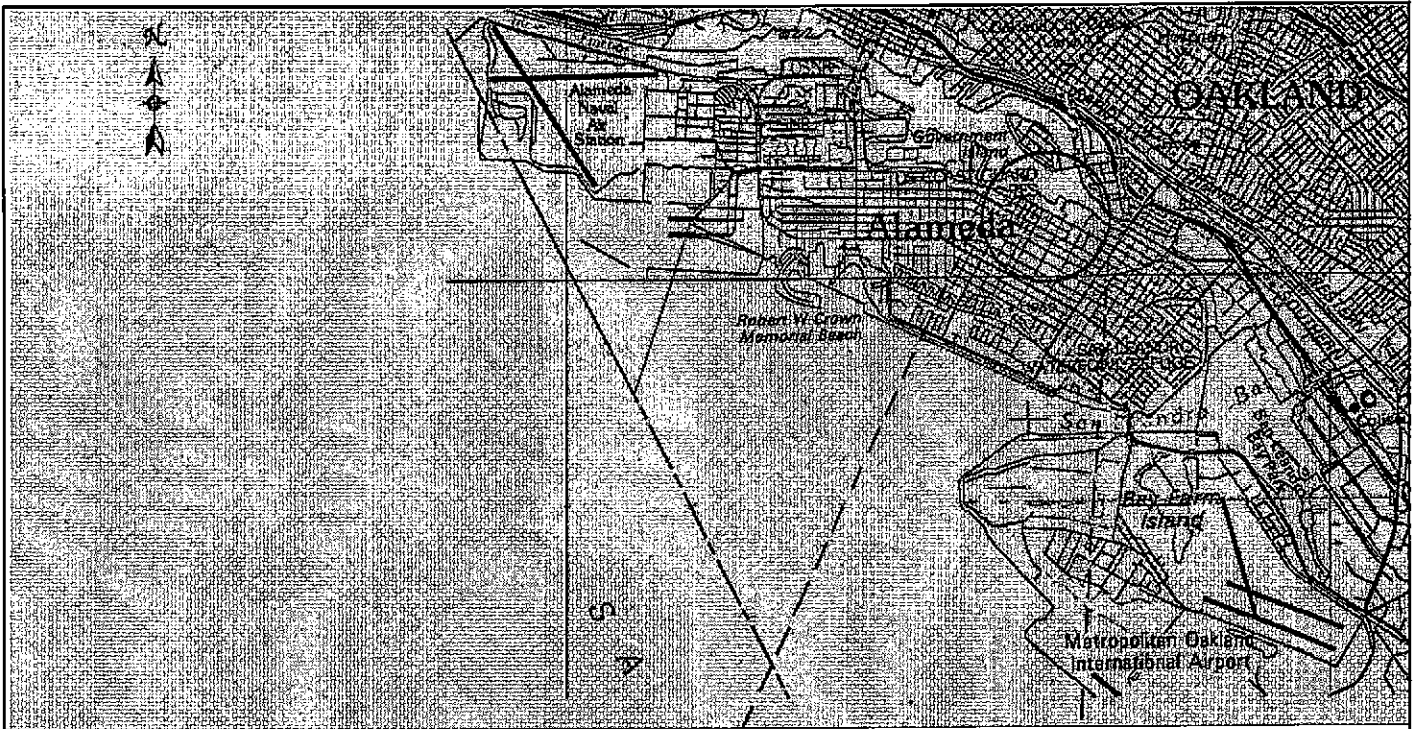
⁹ PCE = Tetrachloroethene

¹⁰ nd = not detected

* Chloroform detected in equipment blank at 1.6 $\mu\text{g/L}$

Table 3.
Relative Percent Difference Based on Duplicate Samples

Analysis	Second Quarter 2000			Third Quarter 2000			Fourth Quarter 2000		
	Well MW-1 Results	DUP-1 Results	RPD ¹ (%)	Well MW-1 Results	DUP-1 Results	RPD ¹ (%)	Well MW-1 Results	DUP-1 Results	RPD ¹ (%)
Organic Compounds ($\mu\text{g/L}$)									
1,1-Dichloroethene	ND ²	ND	NM ³	15	14	6.9	14	16	13.3
Trichloroethene (TCE)	190	160	17.1	170	170	0	130	140	7.4
Tetrachloroethene (PCE)	1,900	1,100	53.3	1,200	1,200	0	880	920	4.4
¹ RPD = relative percent difference ² ND = not detected ³ NM = not meaningful; RPD cannot be accurately calculated where one or both values are below the method reporting limit. All other 8010 analytes not detected.									



Base map (upper): U.S.G.S. 1:1,000,000-scale series (Topographic)
 San Francisco Quadrangle, California, 1976.
 Base map (lower): U.S.G.S. 7.5 minute series (Topographic)
 Oakland East and Oakland West Quadrangles, California,
 1959, Photorevised 1980.

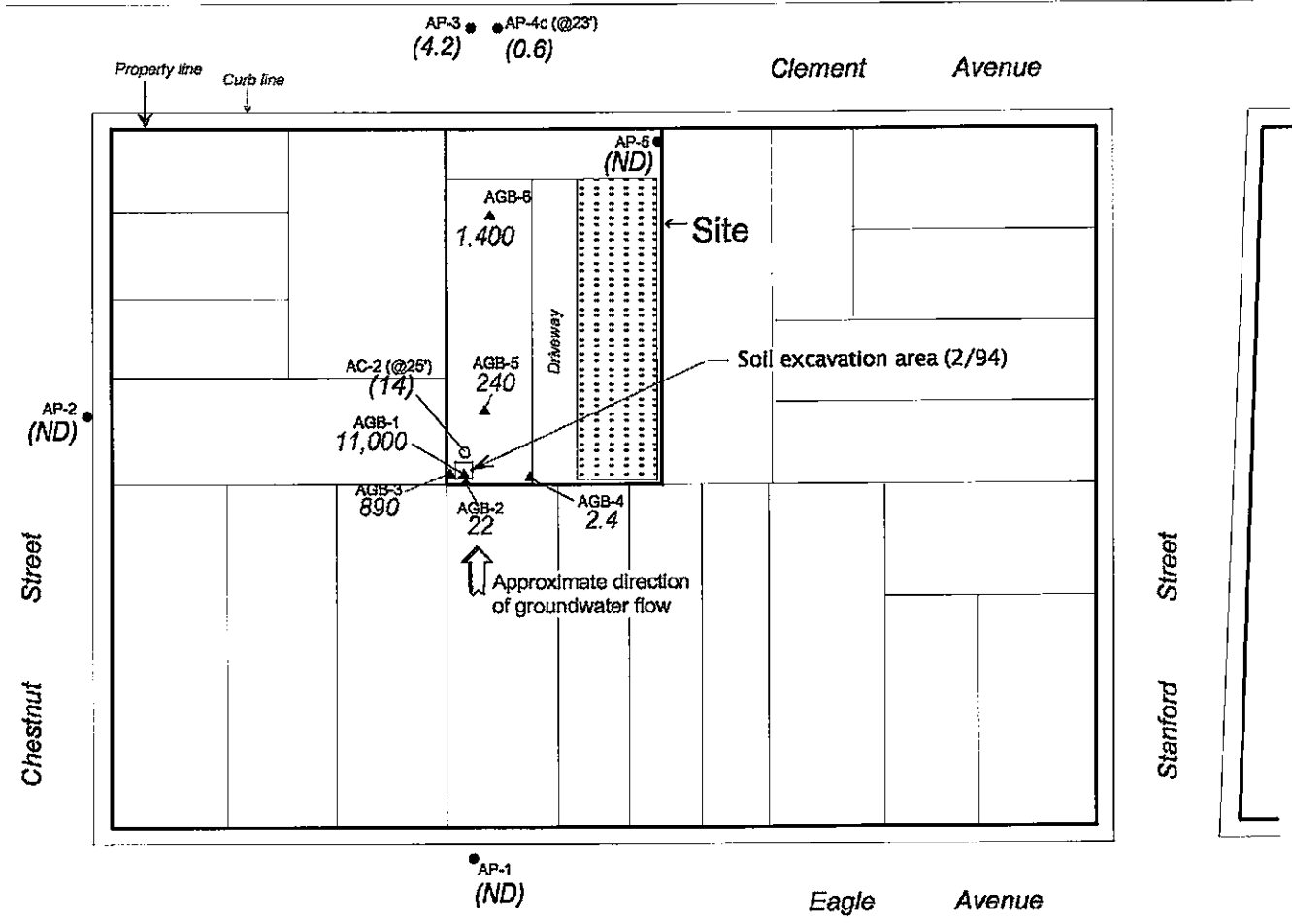
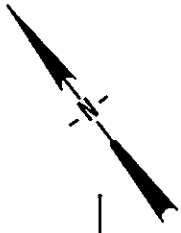


Scale in feet (lower map)



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 2016 Clement Avenue, Alameda, California
 Figure 1. Site Location**



Explanation

- ▲ AGB-5 Hand-augered groundwater sampling boring (Oct-93)
- AP-1 Groundwater sampling probe (Sept-94)
- AC-2 Soil-core boring grab sample (Sept-94)
- 240 PCE concentration (µg/L) in groundwater (Oct-93)
- (4.2) PCE concentration (µg/L) in groundwater (Sept-94)
- ND Not detected

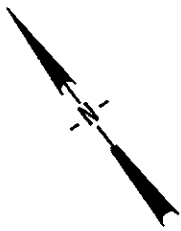


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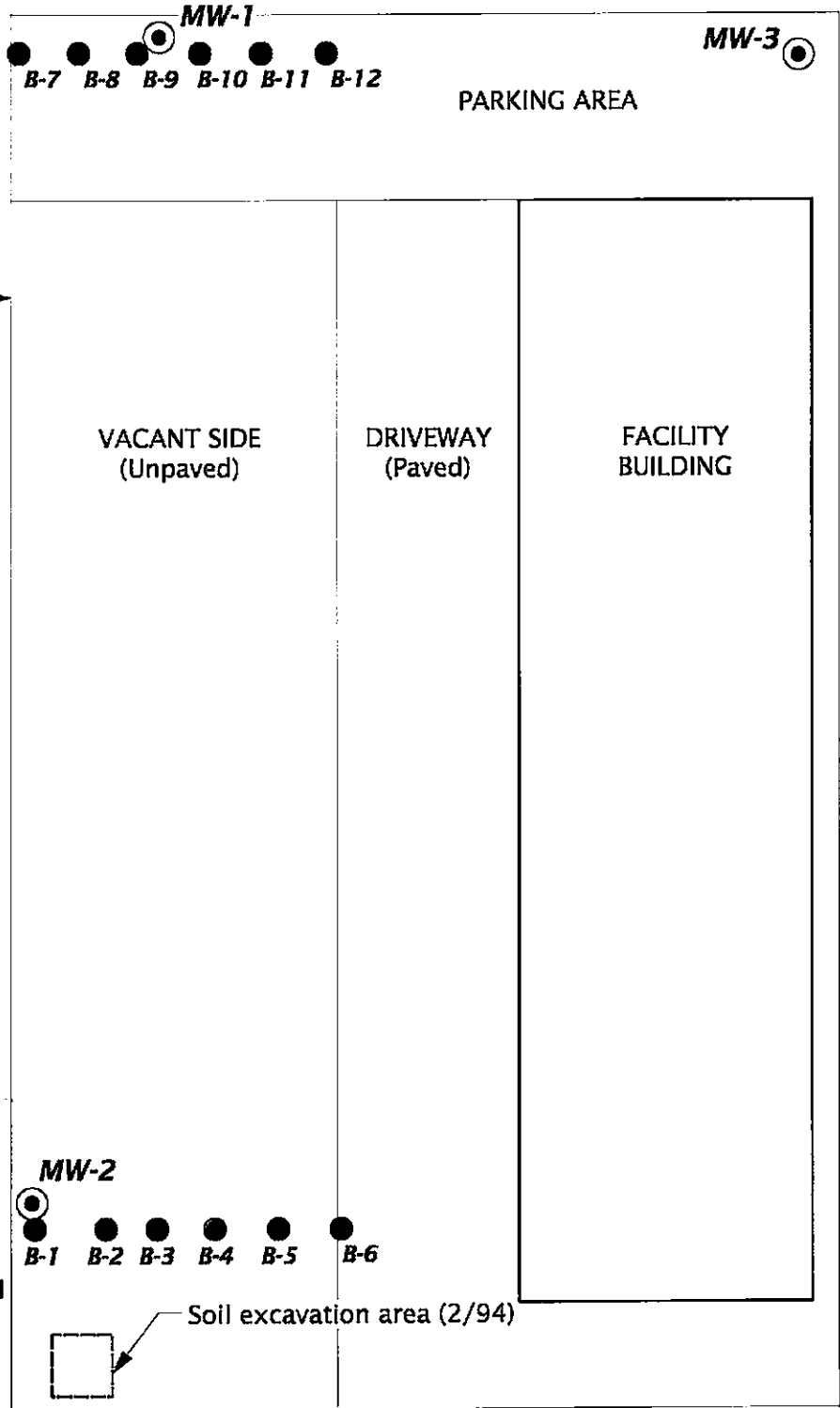


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Project CS1605
Cargill Salt Dispensing Systems Division
2016 Clement Avenue, Alameda, California
**Figure 2. PCE Concentrations in Groundwater -
October 1993 and September 1994**



← Clement Avenue →



Property Line →

VACANT SIDE
(Unpaved)

DRIVEWAY
(Paved)

FACILITY
BUILDING

PARKING AREA

EXPLANATION

- Groundwater monitoring well installed on 11/8/99
- Groundwater grab sample location, 8/99

MW-2

B-1 B-2 B-3 B-4 B-5 B-6

Soil excavation area (2/94)

SCALE: 0 20 40 FEET

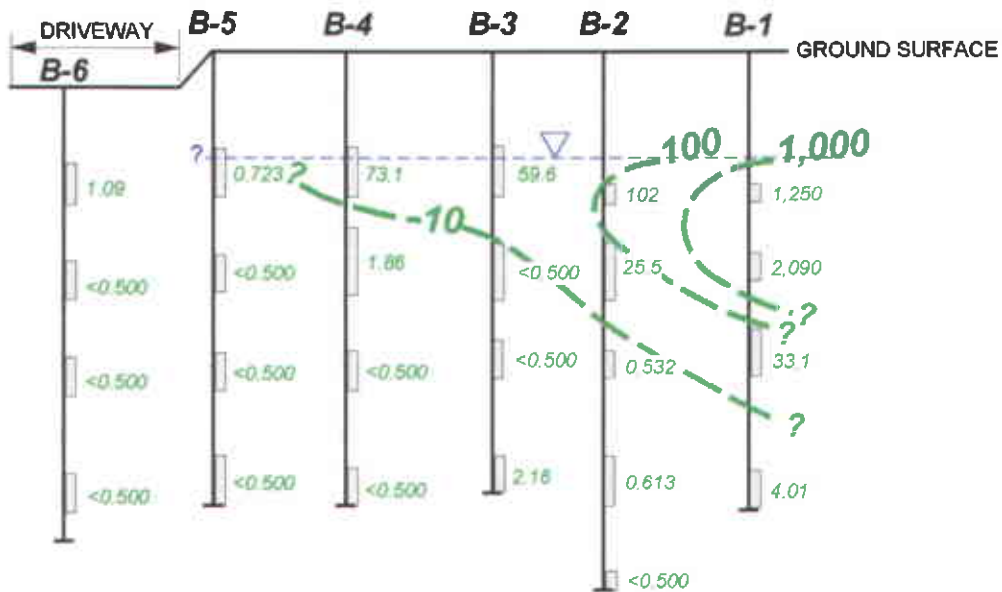


1605fig3.dsf 4/11/01

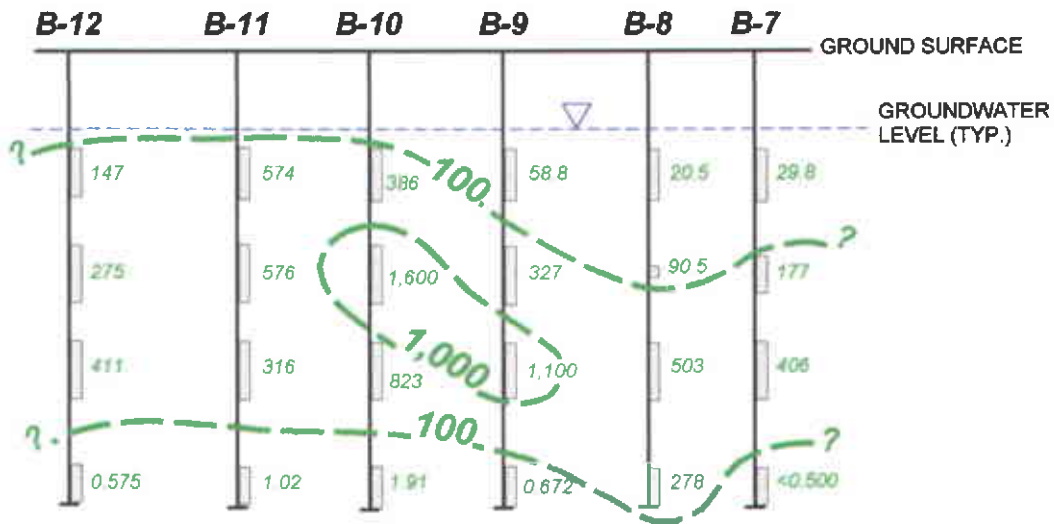


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**Figure 3. Groundwater Transect and Monitoring
Well Locations**



TRANSECT B-1 TO B-6 PCE CONCENTRATIONS (ug/L)
(LOOKING SOUTHWARD)



TRANSECT B-7 TO B-12 PCE CONCENTRATIONS (ug/L)
(LOOKING SOUTHWARD)

EXPLANATION

- B-6** — Boring designation
- 1.09 — Sample interval showing PCE concentration (ug/L)
- 10 — PCE isoconcentration contour (ug/L)

SCALE: 0 10 FEET
 (Vertical and Horizontal)

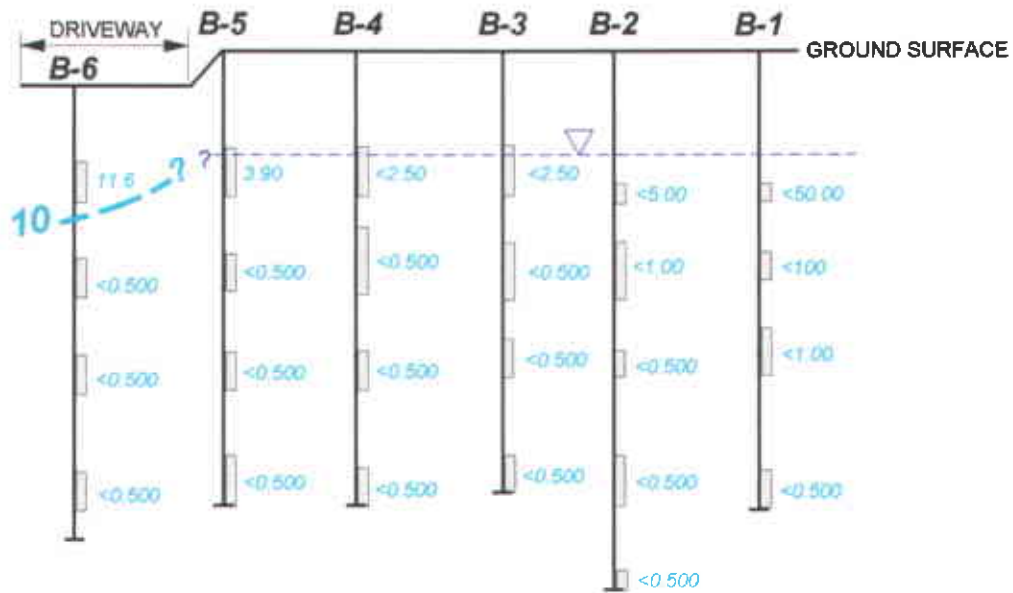
16051q4.dwg 4/11/01



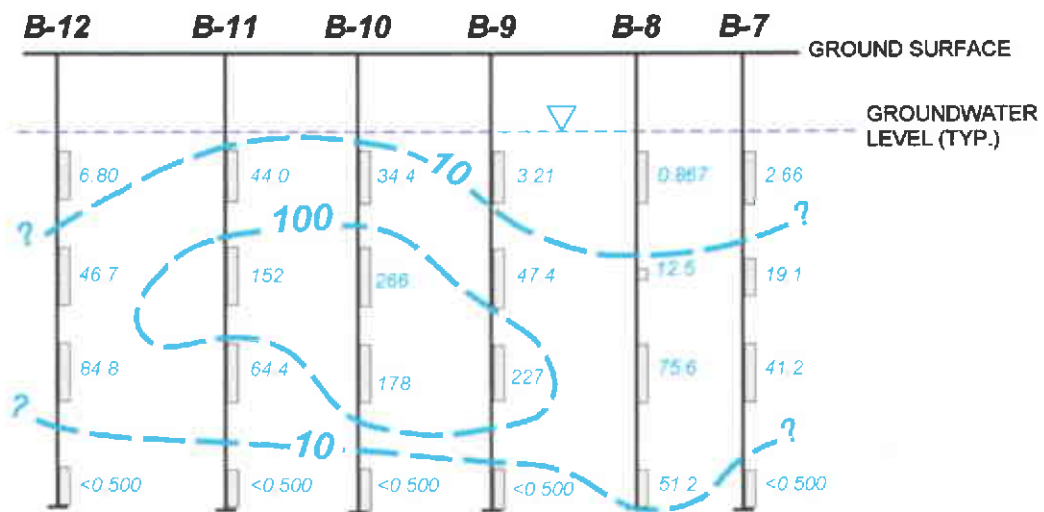
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 2016 Clement Avenue, Alameda, California

Figure 4. Transect PCE Concentrations in Groundwater – August 1999



TRANSECT B-1 TO B-6 TCE CONCENTRATIONS (ug/L)
(LOOKING SOUTHWARD)



TRANSECT B-7 TO B-12 TCE CONCENTRATIONS (ug/L)
(LOOKING SOUTHWARD)

EXPLANATION

- B-6** — Boring designation
- 11.6 — Sample interval showing TCE concentration (ug/L)
- 10 — TCE isoconcentration contour (ug/L)

SCALE: 0 10 FEET
(Vertical and Horizontal)

16051g5.dwg 4/11/01



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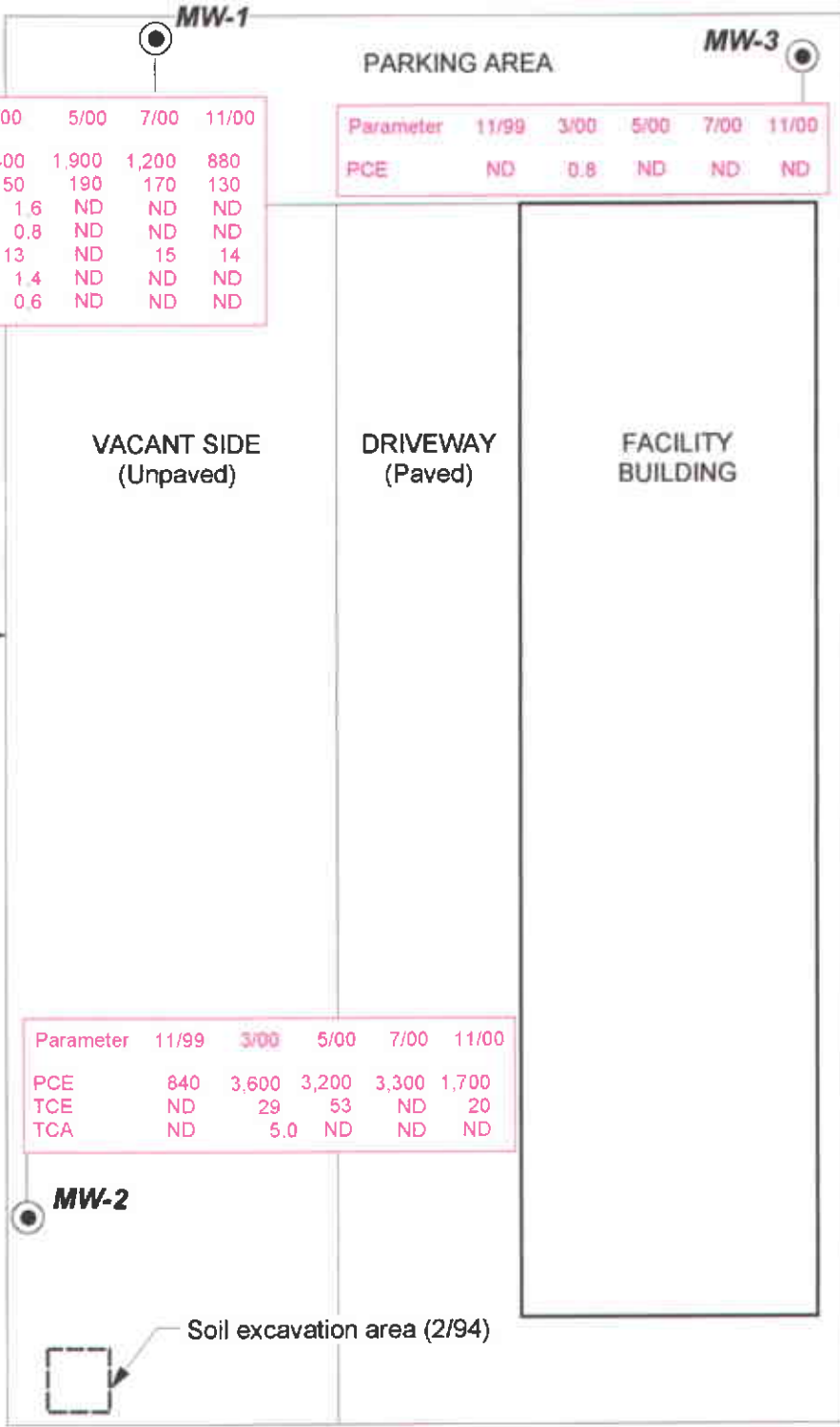
Cargill Salt Dispensing Systems Division
2016 Clement Avenue, Alameda, California
Figure 5. Transect TCE Concentrations in Groundwater – August 1999

← Clement Avenue →



Parameter	11/99	3/00	5/00	7/00	11/00
PCE	906	1,400	1,900	1,200	880
TCE	178	150	190	170	130
TCA	ND	1.6	ND	ND	ND
DCA	ND	0.8	ND	ND	ND
DCE	ND	13	ND	15	14
CFC 113	NA	1.4	ND	ND	ND
Chloroform	ND	0.6	ND	ND	ND

Parameter	11/99	3/00	5/00	7/00	11/00
PCE	ND	0.8	ND	ND	ND



PCE	3,600
TCE	29
TCA	5.0

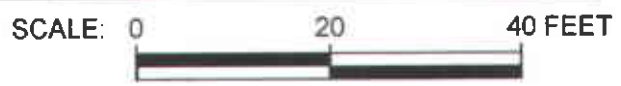
EXPLANATION

- Groundwater monitoring well location
- Analyte concentration
- Analytical parameter

All concentrations reported in micrograms per liter (µg/L), in groundwater. All other 8010 constituents were below detection limits.

- ND = Not detected
- PCE = Tetrachloroethene
- TCE = Trichloroethene
- TCA = 1,1,1-Trichloroethane
- DCA = 1,1-Dichloroethane
- DCE = 1,1-Dichloroethene
- CFC 113 = Trichlorotrifluoroethane
- VOCs = Volatile organic compounds

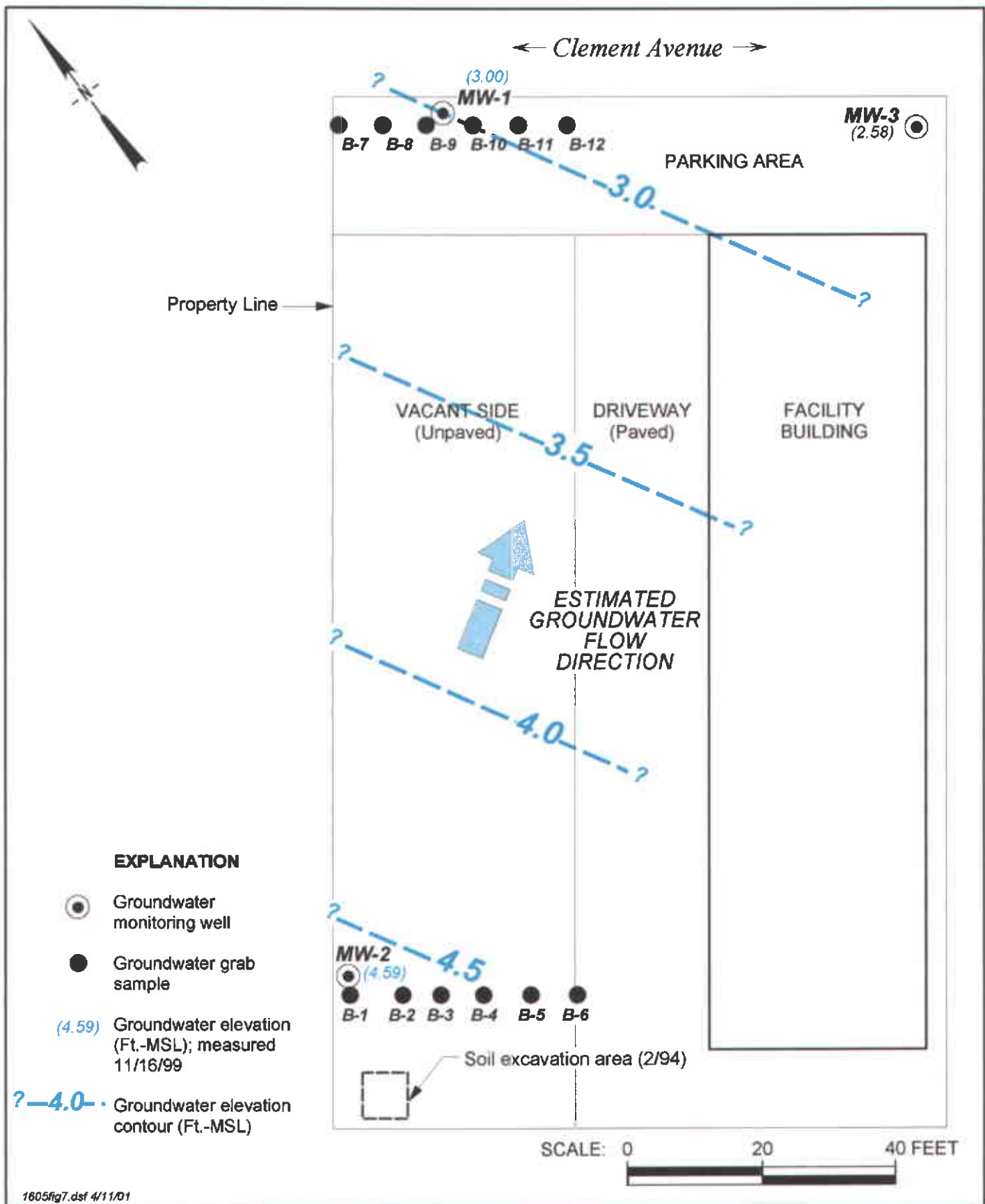
Parameter	11/99	3/00	5/00	7/00	11/00
PCE	840	3,600	3,200	3,300	1,700
TCE	ND	29	53	ND	20
TCA	ND	5.0	ND	ND	ND



1605fig6.dsf 4/11/01



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Figure 6. VOC Concentrations in Groundwater – November 1999 through November 2000



1605fig7.dsf 4/11/01

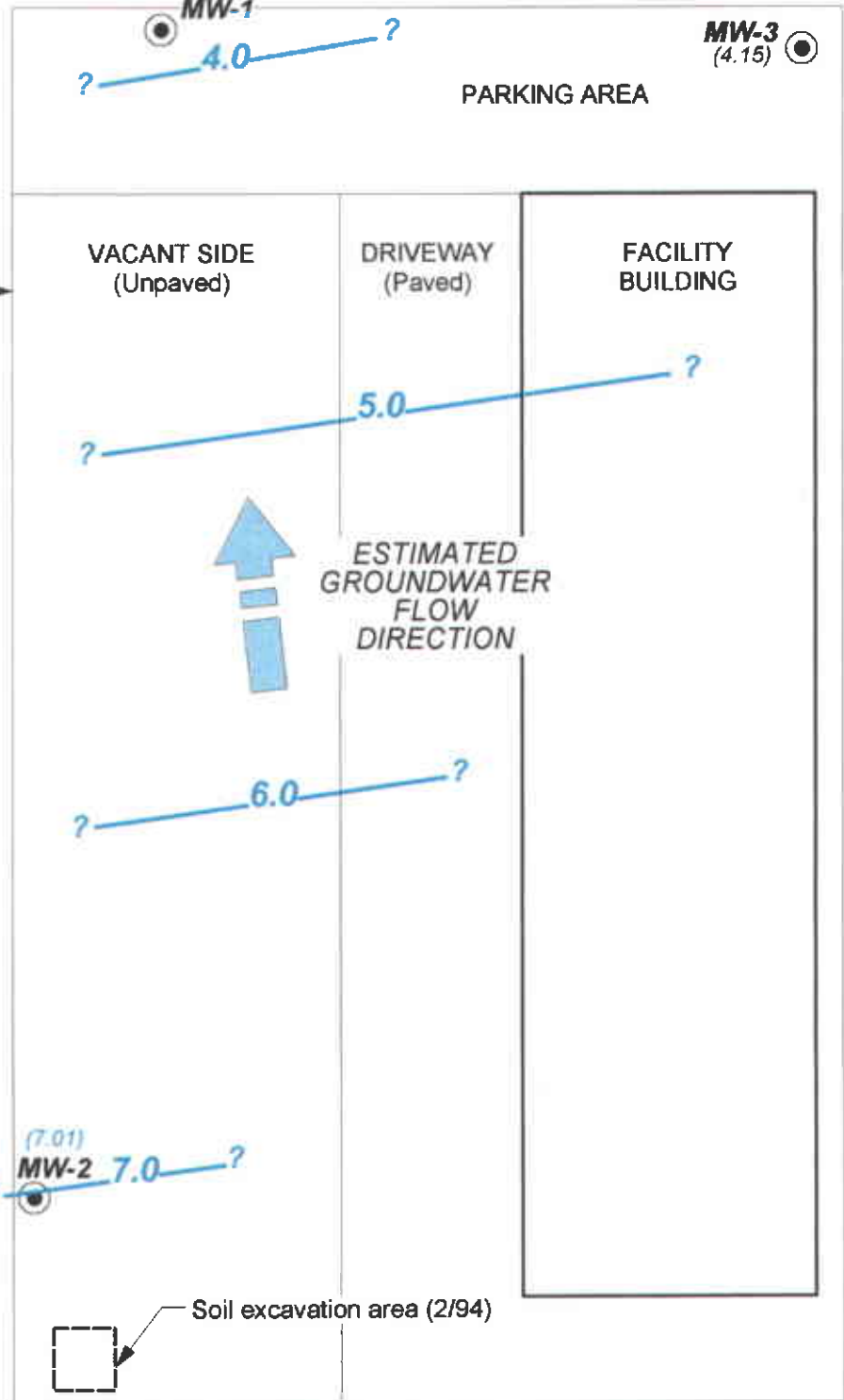


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2016 Clement Avenue, Alameda, California
Figure 7. Groundwater Elevation Contours - November 1999



← Clement Avenue →



Property Line →

VACANT SIDE
(Unpaved)

DRIVEWAY
(Paved)

FACILITY
BUILDING

PARKING AREA

ESTIMATED
GROUNDWATER
FLOW
DIRECTION

Soil excavation area (2/94)

EXPLANATION

⊙ Groundwater monitoring well

(7.01) Groundwater elevation (Ft.-MSL); measured 3/30/00

?-4.0- Groundwater elevation contour (Ft.-MSL)

SCALE: 0 20 40 FEET



1605flg8.dsf 4/11/01



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2016 Clement Avenue, Alameda, California
Figure 8. Groundwater Elevation Contours – March 2000



← Clement Avenue →

(3.43)
MW-1

MW-3
(3.48)

PARKING AREA

Property Line →

? — 4.0 — ?

VACANT SIDE
(Unpaved)

DRIVEWAY
(Paved)

FACILITY
BUILDING



ESTIMATED
GROUNDWATER
FLOW
DIRECTION

? — 5.0 — ?

EXPLANATION

● Groundwater monitoring well

(5.68) Groundwater elevation (Ft.-MSL); measured 5/16/00

? — 4.0 — Groundwater elevation contour (Ft.-MSL)

MW-2
(5.68)

Soil excavation area (2/94)

SCALE: 0 20 40 FEET



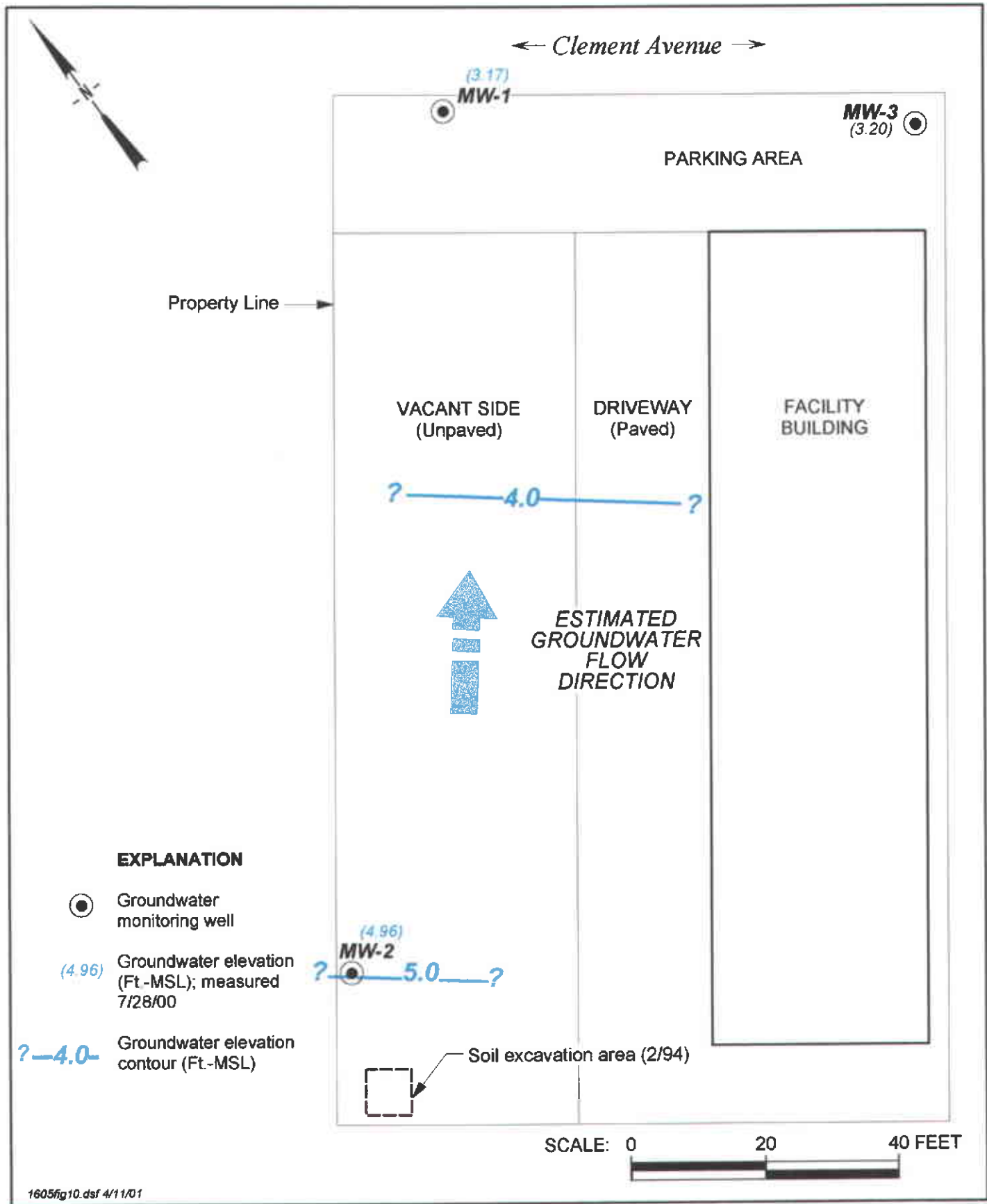
1605fig9.dsf 4/11/01



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2016 Clement Avenue, Alameda, California

Figure 9. Groundwater Elevation Contours – May 2000



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 2016 Clement Avenue, Alameda, California
Figure 10. Groundwater Elevation Contours – July 2000



← Clement Avenue →

(3.23)
MW-1

MW-3
(3.19)

PARKING AREA

Property Line →

VACANT SIDE
(Unpaved)

DRIVEWAY
(Paved)

FACILITY
BUILDING

? — 4.0 — ?



ESTIMATED
GROUNDWATER
FLOW
DIRECTION

EXPLANATION

⊙ Groundwater monitoring well

(5.06) Groundwater elevation (Ft.-MSL); measured 11/30/00

? — 4.0 — Groundwater elevation contour (Ft.-MSL)

? — 5.0 — ?

MW-2
(5.06)

Soil excavation area (2/94)



SCALE: 0 20 40 FEET



1605fig11.dsf 4/11/01



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2016 Clement Avenue, Alameda, California

Figure 11. Groundwater Elevation Contours – November 2000

Appendix A

Field Data Sheets

WATER LEVEL FIELD DATA

Cargill Salt
 Alameda Facility
 Alameda, California
 Project No. CS1605

Well ID	Date	Time	Depth to Water (1st Msmt.) (feet)	Depth to Water (2nd Msmt.) (feet)	Comments
MW-1	3/30/00	1009	2.81	2.81	TD = 18.34
MW-2	3/30/00	1005	2.80	2.80	TD = 15.92
MW-3	3/30/00	1001	2.77	2.77	TD = 17.57

Data Collection

Field measurements by:

Print: J. Butera
 Signature: [Signature]
 Date: 3/30/00

Reviewed by:

Print: P. Lacey
 Signature: [Signature]
 Date: 4-10-00

⊕ Removed well caps and allow wells to stabilize for 15 minutes before recording readings.

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-1
 Sample ID: MW-1
 Start Date: 3/30/00
 Finish Date: 3/30/00

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 2.81 Well depth (ft): 18.3
 One casing volume (gal.): 0.64 Calculated purge volume (gal.) (3 x casing volume): 1.9
 One casing volume = $\pi \times [\text{casing radius (in.)} \times 1 \text{ ft}/12 \text{ in.}]^2 \times [\text{well depth (ft)} - \text{depth to water (ft)}] \times 7.48 \text{ gal/ft}^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): ND Method for checking: Interface probe Clear bailer

WELL PURGING

Date purged: 3/30/00 Start time: 1318 End time: 1403
 Purging equipment: Submersible pump Bladder pump Peristaltic pump
 PVC bailer Teflon bailer Other
 Purge rate: 0.04 gpm Well yield (H/L): low
 Purge water disposal: Contained in steel 5-gallon pail w/ lid on site

Time (2400 hr)	Cumulative Vol. Purged (gal.)	pH (units)	EC (mS/cm)	T (°C)	Color (Visual)	Turbidity (Visual or NTU)
<u>1333</u>	<u>0.65</u>	<u>7.20</u>	<u>598</u>	<u>17.3</u>	<u>cloudy</u>	<u>94.7</u>
<u>1340</u>	<u>1.3</u>	<u>7.17</u>	<u>580</u>	<u>17.3</u>	<u>cloudy</u>	<u>128.0</u>
<u>1403</u>	<u>1.9</u>	<u>7.16</u>	<u>572</u>	<u>17.4</u>	<u>cloudy</u>	<u>75.9</u>
Total Purged (gal.): <u>1.9</u>						

WELL SAMPLING

Date sampled: 3/30/00 Start time: 1404 End time: 1406
 Depth to water (ft) before sampling: 10.21
 Sampling equipment: Peristaltic pump Bladder pump Teflon bailer
 PVC bailer Other

Weather conditions: clear warm Ambient temperature (°F): 65
 Well condition/Remarks: purge at slow rate to avoid degassing well. water level draw down to 10.21 feet following purge. sample

Meter calibration: EC _____ pH _____
 Temperature _____ Turbidity _____
 Purged and sampled by (print): J. Butova
 Signature: [Signature] Reviewed by: [Signature]

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-2
 Sample ID: MW-2
 Start Date: 3/30/00
 Finish Date: 3/30/00

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 2.80 Well depth (ft): 15.9
 One casing volume (gal.): 0.54 Calculated purge volume (gal.) (3 x casing volume): 1.6
 One casing volume = $\pi \times [\text{casing radius (in.)} \times 1 \text{ ft}/12 \text{ in.}]^2 \times [\text{well depth (ft)} - \text{depth to water (ft)}] \times 7.48 \text{ gal/ft}^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): NO Method for checking: Interface probe Clear bailer

WELL PURGING

Date purged: 3/30/00 Start time: 1208 End time: 1243
 Purging equipment: Submersible pump Bladder pump Peristaltic pump
 PVC bailer Teflon bailer Other
 Purge rate: 0.05 gpm Well yield (H/L): low moderate
 Purge water disposal: contained in steel 5-gallon pail on site.

Time (2400 hr)	Cumulative Vol. Purged (gal.)	pH (units)	EC (mS/cm)	T (°C)	Color (Visual)	Turbidity (Visual or NTU)
<u>1225</u>	<u>0.6</u>	<u>6.82</u>	<u>564</u>	<u>16.0</u>	<u>Cloudy</u>	<u>122.0</u>
<u>1235</u>	<u>1.2</u>	<u>6.78</u>	<u>540</u>	<u>15.9</u>	<u>Cloudy</u>	<u>90.5</u>
<u>1243</u>	<u>1.7</u>	<u>6.76</u>	<u>532</u>	<u>15.8</u>	<u>Cloudy</u>	<u>66.3</u>

Total Purged (gal.): 1.7

WELL SAMPLING

Date sampled: 3/30/00 Start time: 1244 End time: 1247
 Depth to water (ft) before sampling: 5.25
 Sampling equipment: Peristaltic pump Bladder pump Teflon bailer
 PVC bailer Other

Weather conditions: Clear warm Ambient temperature (° F): 65
 Well condition/Remarks: located in field near back corner of lot. Purge well at slow pump speed to avoid dewatering. DTW remained at 5.25 feet during purge and sample. Immediately following sample collection removed check valve from tubing and removed silt from bottom of well. Removed additional 2 liters of silt and water.
 Meter calibration: EC _____ pH _____
 Temperature _____ Turbidity _____

Purged and sampled by (print): J. Butera
 Signature: [Signature] Reviewed by: [Signature]

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: Equipment Blank
 Sample ID: EB-1
 Start Date: 3/30/00
 Finish Date: 3/30/00

WELL INFORMATION

Casing diameter (in.): _____ Depth to water (ft): NA Well depth (ft): _____
 One casing volume (gal.): _____ Calculated purge volume (gal.) ($3 \times$ casing volume): _____
 $One\ casing\ volume = \pi \times [casing\ radius\ (in.) \times 1\ ft/12\ in.]^2 \times [well\ depth\ (ft) - depth\ to\ water\ (ft)] \times 7.48\ gal/ft^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): _____ Method for checking: Interface probe _____ Clear bailer _____

WELL PURGING

Date purged: _____ Start time: _____ End time: _____
 Purging equipment: Submersible pump _____ Bladder pump _____ Peristaltic pump _____
 PVC bailer _____ Teflon bailer _____ Other _____
 Purge rate: _____ Well yield (H/L): _____
 Purge water disposal: _____

Time (2400 hr)	Cumulative Vol. Purged (gal.)	pH (units)	EC (mS/cm)	T (° C)	Color (Visual)	Turbidity (Visual or NTU)

Total Purged (gal.): _____

WELL SAMPLING

Date sampled: 3/30/00 Start time: 1036 End time: 1042
 Depth to water (ft) before sampling: _____
 Sampling equipment: Peristaltic pump Bladder pump _____ Teflon bailer _____
 PVC bailer _____ Other _____

Weather conditions: Clear Warm Ambient temperature (° F): 60
 Well condition/Remarks: Collected sample from peristaltic pump discharge. Tubing no lab prep work. PI water was pumped through tubing before it was dedicated to well MW-1 & check valve.

Meter calibration: Temperature _____ EC _____ pH _____ Turbidity _____

Purged and sampled by (print): J. Butera
 Signature: J. Butera Reviewed by: [Signature]

WATER LEVEL FIELD DATA

Cargill Salt
 Alameda Facility
 Alameda, California
 Project No. CS1605

Well ID	Date	Time	Depth to Water (1st Msmt.) (feet)	Depth to Water (2nd Msmt.) (feet)	Comments
MW-1	5/16/00	09:43	3.32	3.32	TB=18.25
MW-2	5/16/00	09:35	4.13	4.13	Lid and cap secure ID=15.95
MW-3	5/16/00	09:46	3.44	3.44	TB=17.60

Data Collection

Field measurements by:

Print: A. MARTIN
 Signature: [Signature]
 Date: 5/16/00

Reviewed by:

Print: J. Butera
 Signature: [Signature]
 Date: 5/18/00

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-2
 Sample ID: MW-2
 Start Date: 5/16/00
 Finish Date: 5/16/00

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 4.13 Well depth (ft): 15.9
 One casing volume (gal.): 0.48 Calculated purge volume (gal.) (3 x casing volume): 1.44
 One casing volume = $\pi \times [\text{casing radius (in.)} \times 1 \text{ ft}/12 \text{ in.}]^2 \times [\text{well depth (ft)} - \text{depth to water (ft)}] \times 7.48 \text{ gal/ft}^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): ND Method for checking: Interface probe Clear bailer

WELL PURGING

Date purged: 5/16/00 Start time: 10:28 End time: 11:07
 Purging equipment: Submersible pump Bladder pump Peristaltic pump
 PVC bailer Teflon bailer Other
 Purge rate: 0.038 gpm Well yield (H/L): Moderate
 Purge water disposal: transfer to steel 5 gallon drum/pail on site

Time (2400 hr)	Cumulative Vol. Purged (gal.)	pH (units)	EC (mS/cm)	T (°C)	Color (Visual)	Turbidity (Visual or NTU)
<u>10:46</u>	<u>0.50</u>	<u>6.57</u>	<u>538</u>	<u>16.9</u>	<u>Cloudy</u>	<u>68</u>
<u>10:58</u>	<u>1.00</u>	<u>6.48</u>	<u>487</u>	<u>16.3</u>	<u>Cloudy</u>	<u>131</u>
<u>11:07</u>	<u>1.50</u>	<u>6.47</u>	<u>483</u>	<u>16.3</u>	<u>Cloudy</u>	<u>42.43</u>
Total Purged (gal.): <u>1.5</u>						

WELL SAMPLING

Date sampled: 5/16/00 Start time: 11:10 End time: 11:12
 Depth to water (ft) before sampling: 4.93
 Sampling equipment: Peristaltic pump Bladder pump Teflon bailer
 PVC bailer Other

Weather conditions: at-cast Ambient temperature (° F): 70°
 Well-condition/Remarks: Lid & well box OK; cap secure
Collected all samples

Meter calibration: 09:55 EC 1361/1413 pH 7.02/7.04/3.91/4.00/10.11/10.11
 Temperature 16.8°C Turbidity _____

Purged and sampled by (print): A. MARTIN Signature: [Signature] Reviewed by: [Signature] ✓DCB

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-3
 Sample ID: MW-3
 Start Date: 5/16/00
 Finish Date: 5/16/00

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 3.44 Well depth (ft): 17.6
 One casing volume (gal.): 0.58 Calculated purge volume (gal.) (3 x casing volume): 1.74
 One casing volume = $\pi \times [\text{casing radius (in.)} \times 1 \text{ ft}/12 \text{ in.}]^2 \times [\text{well depth (ft)} - \text{depth to water (ft)}] \times 7.48 \text{ gal/ft}^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): ND Method for checking: Interface probe Clear bailer

WELL PURGING

Date purged: 5/16/00 Start time: 11:37 End time: 12:15
 Purging equipment: Submersible pump Bladder pump Peristaltic pump
 PVC bailer Teflon bailer Other
 Purge rate: 0.064 Well yield (H/L): Low/moderate
 Purge water disposal: Contained in steel 5 gallon drum on site

Time (2400 hr)	Cumulative Vol. Purged (gal.)	pH (units)	EC (mS/cm)	T (°C)	Color (Visual)	Turbidity (Visual or NTU)
<u>11:48</u>	<u>0.6</u>	<u>8.03</u>	<u>582</u>	<u>16.1</u>	<u>Cloudy</u>	<u>321</u>
<u>12:00</u>	<u>1.2</u>	<u>7.91</u>	<u>588</u>	<u>16.3</u>	<u>Cloudy</u>	<u>542</u>
<u>12:15</u>	<u>1.8</u>	<u>7.19</u>	<u>595</u>	<u>16.7</u>	<u>Cloudy</u>	<u>275</u>
Total Purged (gal.): <u>1.8</u>						

WELL SAMPLING

Date sampled: 5/16/00 Start time: 12:16 End time: 12:18
 Depth to water (ft) before sampling: 15.17
 Sampling equipment: Peristaltic pump Bladder pump Teflon bailer
 PVC bailer Other

Weather conditions: overcast Ambient temperature (° F): 70°
 Well condition/Remarks: Lid in well box OK; cap secure
Collected all samples

Meter calibration: 09:55 EC 0 MW-2 pH _____
 Temperature _____ Turbidity _____
 Purged and sampled by (print): A. MARTIN Signature: [Signature] Reviewed by: [Signature] ✓ DOB

WATER LEVEL FIELD DATA

Cargill Salt
 Alameda Facility
 Alameda, California
 Project No. CS1605

Well ID	Date	Time	Depth to Water (1st Msmt.) (feet)	Depth to Water (2nd Msmt.) (feet)	Comments
MW-1	7/28/00	09:11	3.58	3.58	well box OK; slip cap secure
MW-2	7/28/00	09:17	4.85	4.85	well box OK; slip cap secure
MW-3	7/28/00	09:05	3.72	3.72	well box OK; slip cap secure

Data Collection

Field measurements by: Print: <u>A. MARTIN</u> Signature: <u>[Signature]</u> Date: <u>7/27/00</u>	Reviewed by: Print: <u>[Signature]</u> Signature: <u>[Signature]</u> Date: <u>7/31/00</u>
--	--

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-1
 Sample ID: MW-1 + DUP-1
 Start Date: 7/28/00
 Finish Date: 7/28/00

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 3.58 Well depth (ft): 18.6
 One casing volume (gal.): 0.62 Calculated purge volume (gal.) (3 x casing volume): 1.846
 One casing volume = $\pi \times [\text{casing radius (in.)} \times 1 \text{ ft}/12 \text{ in.}]^2 \times [\text{well depth (ft)} - \text{depth to water (ft)}] \times 7.48 \text{ gal/ft}^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): ND Method for checking: Interface probe Clear bailer

WELL PURGING

Date purged: 7/28/00 Start time: 12:37 End time: 13:25
 Purging equipment: Submersible pump Bladder pump Peristaltic pump
 PVC bailer Teflon bailer Other
 Purge rate: 0.039 gpm Well yield (H/L): Low/moderate
 Purge water disposal: transfer to steel pail on site

Time (2400 hr)	Cumulative Vol. Purged (gal.)	pH (units)	EC (mS/cm)	T (° C)	Color (Visual)	Turbidity (Visual or NTU)
<u>12:55</u>	<u>0.65</u>	<u>6.79</u>	<u>535</u>	<u>19.6</u>	<u>Clear</u>	<u>21.79</u>
<u>13:11</u>	<u>1.3</u>	<u>6.77</u>	<u>531</u>	<u>19.3</u>	<u>Clear</u>	<u>36.02</u>
<u>13:25</u>	<u>1.9</u>	<u>6.77</u>	<u>529</u>	<u>19.2</u>	<u>Clear</u>	<u>14.17</u>
Total Purged (gal.): <u>1.9</u>						

WELL SAMPLING

Date sampled: 7/28/00 Start time: 13:26 End time: 13:33
 Sampling equipment: Peristaltic pump Bladder pump Teflon bailer
 PVC bailer Other
 Depth to water (ft) before sampling: 11.91

Weather conditions: Warm; Clear Ambient temperature (° F): 70°
 Well condition/Remarks: well box OK; slip cap secure
Collected all samples + DUP-1

Meter calibration: AMW-2 EC pH _____
 Temperature _____ Turbidity _____

Purged and sampled by (print): A. MARTIN Signature: [Signature] Reviewed by: [Signature] LDDB

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
Project Name: Alameda Facility
Location: Alameda, CA
Client: Cargill Salt

Well ID: MW-2
Sample ID: MW-2
Start Date: 7/28/00
Finish Date: 7/28/00

WELL INFORMATION

Casing diameter (in.): 6.61.0 Depth to water (ft): 4.85 Well depth (ft): 17.2
One casing volume (gal.): 0.5 Calculated purge volume (gal.) (3 x casing volume): 1.5
One casing volume = pi x [casing radius (in.) x 1 ft/12 in.]^2 x [well depth (ft) - depth to water (ft)] x 7.48 gal/ft^3
Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
Floating product thickness (ft): Method for checking: Interface probe X Clear bailer

WELL PURGING

Date purged: 7/28/00 Start time: 10:10 End time: 10:59
Purging equipment: Submersible pump Bladder pump Peristaltic pump X
PVC bailer Teflon bailer Other
Purge rate: 0.03 gpm Well yield (H/L): Moderate
Purge water disposal: transfer to steel pan on site

Table with 7 columns: Time (2400 hr), Cumulative Vol. Purged (gal.), pH (units), EC (mS/cm), T (°C), Color (Visual), Turbidity (Visual or NTU). Rows show data at 10:30, 10:45, and 10:59.

Total Purged (gal.): 1.5

WELL SAMPLING

Date sampled: 7/28/00 Start time: 11:00 End time: 11:03
Depth to water (ft) before sampling: NR
Sampling equipment: Peristaltic pump X Bladder pump Teflon bailer
PVC bailer Other

Weather conditions: Wavy; Clear Ambient temperature (° F): 70°
Well condition/Remarks: well box ok; ship cap secure

Meter calibration: 7/28/00 EC 1731/1785
Temperature 18.4

pH 3.79/4.00 | 6.93/7.03 | 9.99/10.00
Turbidity 0.12/0.00
10.76/9.94

Purged and sampled by (print): A. MARTIN
Signature: [Handwritten Signature]

Reviewed by: [Handwritten Signature] LOOB

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-3
 Sample ID: MW-3
 Start Date: 7/28/00
 Finish Date: 7/28/00

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 3.72 Well depth (ft): 17.8
 One casing volume (gal.): 0.57 Calculated purge volume (gal.) (3 x casing volume): 1.7
 One casing volume = $\pi \times [\text{casing radius (in.)} \times 1 \text{ ft}/12 \text{ in.}]^2 \times [\text{well depth (ft)} - \text{depth to water (ft)}] \times 7.48 \text{ gal/ft}^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): ND Method for checking: Interface probe Clear bailer

WELL PURGING

Date purged: 7/28/00 Start time: 11:25 End time: 12:15
 Purging equipment: Submersible pump Bladder pump Peristaltic pump
 PVC bailer Teflon bailer Other
 Purge rate: 0.034 gpm Well yield (H/L): Low
 Purge water disposal: transfer to steel pail on site

Time (2400 hr)	Cumulative Vol. Purged (gal.)	pH (units)	EC (mS/cm)	T (°C)	Color (Visual)	Turbidity (Visual or NTU)
<u>11:40</u>	<u>0.6</u>	<u>6.97</u>	<u>559</u>	<u>19.3</u>	<u>Clear</u>	<u>62</u>
<u>11:56</u>	<u>1.2</u>	<u>6.98</u>	<u>553</u>	<u>19.2</u>	<u>Clear</u>	<u>68</u>
<u>12:15</u>	<u>1.7</u>	<u>7.01</u>	<u>560</u>	<u>19.2</u> <u>19.1</u>	<u>Clear</u>	<u>47.99</u>
Total Purged (gal.): <u>1.7</u>						

WELL SAMPLING

Date sampled: 7/28/00 Start time: 12:16 End time: 12:25
 Depth to water (ft) before sampling: 16.12
 Sampling equipment: Peristaltic pump Bladder pump Teflon bailer
 PVC bailer Other

Weather conditions: Warm, Clear Ambient temperature (° F): 70°
 Well condition/Remarks: well box OK, slip cap secure
collected all samples

Meter calibration: MW-2 EC _____ pH _____
 Temperature _____ Turbidity _____
 Purged and sampled by (print): A. MARTIN LOCB
 Signature: [Signature] Reviewed by: [Signature]

WATER LEVEL FIELD DATA

Cargill Salt
 Alameda Facility
 Alameda, California
 Project No. CS1605

Well ID	Date	Time	Depth to Water (1st Msmt.) (feet)	Depth to Water (2nd Msmt.) (feet)	Comments
MW-1	11-30-00	0836	3.52	3.52	Water in box above TOC, CAP secure
MW-2	11-30-00	0832	4.75	4.75	located along fence inside yard. Cap secure
MW-3	11-30-00	0834	3.73	3.73	Water in box above TOC, CAP secure

Data Collection

Field measurements by:

Print: J. Butera
 Signature: [Signature]
 Date: 11-30-00

Reviewed by:

Print: P. Lacey
 Signature: [Signature]
 Date: 12-4-00

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-1
 Sample ID: MW-1
 Start Date: 11-30-00
 Finish Date: 11-30-00

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 3.52 Well depth (ft): 19.3
 One casing volume (gal.): 0.61 Calculated purge volume (gal.) (3 x casing volume): 1.8
 One casing volume = $\pi \times [\text{casing radius (in.)} \times 1 \text{ ft}/12 \text{ in.}]^2 \times [\text{well depth (ft)} - \text{depth to water (ft)}] \times 7.48 \text{ gal/ft}^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): NA Method for checking: _____ Interface probe _____ Clear bailer _____

WELL PURGING

Date purged: 11-30-00 Start time: 1047 End time: 1117
 Purging equipment: Submersible pump _____ Bladder pump _____ Peristaltic pump X
 PVC bailer _____ Teflon bailer _____ Other _____
 Purge rate: 0.04 gpm Well yield (H/L): Moderate
 Purge water disposal: Contained in 5 gallon pail onsite

Time (2400 hr)	Cumulative Vol. Purged (gal.)	pH (units)	EC (mS/cm)	T (°C)	Color (Visual)	Turbidity (Visual or NTU)
<u>1058</u>	<u>0.6</u>	<u>7.41</u>	<u>598</u>	<u>16.2</u>	<u>Clear</u>	<u>16.7</u>
<u>1108</u>	<u>1.2</u>	<u>7.28</u>	<u>597</u>	<u>16.6</u>	<u>Clear</u>	<u>16.6</u>
<u>1117</u>	<u>1.8</u>	<u>7.29</u>	<u>597</u>	<u>16.6</u>	<u>Clear</u>	<u>16.3</u>
Total Purged (gal.): <u>1.8</u>						

WELL SAMPLING

Date sampled: 11-30-00 Start time: 1118 End time: 1120
 Depth to water (ft) before sampling: 8.24
 Sampling equipment: Peristaltic pump X Bladder pump _____ Teflon bailer _____
 PVC bailer _____ Other _____

Weather conditions: Cloudy Ambient temperature (° F): 55
 Well condition/Remarks: Water in box above TOC. Cap secure, removed water before accessing well head. Well recharges at moderate rate, initial draw-down then stabilizes at approx 80 feet at above pump rate. Collected duplicate sample at well.

Meter calibration: EC 11-30-00 @ MW-2 pH _____
 Temperature _____ Turbidity _____

Purged and sampled by (print): J Butera
 Signature: [Signature] Reviewed by: [Signature]

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-2
 Sample ID: MW-2
 Start Date: 11/30/00
 Finish Date: 11/30/00

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 4.75 Well depth (ft): 17.5
 One casing volume (gal.): 0.53 Calculated purge volume (gal.) (3 x casing volume): 1.6
 $One\ casing\ volume = \pi \times [casing\ radius\ (in.) \times 1\ ft/12\ in.]^2 \times [well\ depth\ (ft) - depth\ to\ water\ (ft)] \times 7.48\ gal/ft^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): NA Method for checking: Interface probe Clear bailer Clear bailer

WELL PURGING

Date purged: 11-30-00 Start time: 0856 End time: 0933
 Purging equipment: Submersible pump _____ Bladder pump _____ Peristaltic pump X
 PVC bailer _____ Teflon bailer _____ Other _____
 Purge rate: 0.04 gpm Well yield (H/L): Moderate
 Purge water disposal: Contained in 5 gallon

Time (2400 hr)	Cumulative Vol. Purged (gal.)	pH (units)	EC (mS/cm)	T (°C)	Color (Visual)	Turbidity (Visual or NTU)
<u>0909</u>	<u>0.5</u>	<u>6.37</u>	<u>504</u>	<u>13.8</u>	<u>cloudy</u>	<u>133.0</u>
<u>0920</u>	<u>1.0</u>	<u>6.42</u>	<u>502</u>	<u>15.1</u>	<u>clear</u>	<u>9.9</u>
<u>0933</u>	<u>1.6</u>	<u>6.43</u>	<u>501</u>	<u>15.2</u>	<u>clear</u>	<u>8.3</u>

Total Purged (gal.): 1.6

WELL SAMPLING

Date sampled: 11-30-00 Start time: 0934 End time: 0936
 Depth to water (ft) before sampling: 6.83
 Sampling equipment: Peristaltic pump X Bladder pump _____ Teflon bailer _____
 PVC bailer _____ Other _____

Weather conditions: Cloudy Ambient temperature (° F): 55
 Well condition/Remarks: located near fences in field onsite. Purge well at lowest pump speed to avoid dewatering well. Well recharges slow at rate slightly slower than lowest pump setting. Monitored drawdown during purge. Collected all samples.

Meter calibration: EC 4,690 / 14,500 pH 3.97-4.00 6.08-6.82
 Temperature 10.4 °C Turbidity 0.9-0.1

Purged and sampled by (print): J. Butprg Signature: J. Butprg Reviewed by: [Signature] LDG

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-3
 Sample ID: MW-3
 Start Date: 11-30-00
 Finish Date: 11-30-00

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 3.73 Well depth (ft): 17.6
 One casing volume (gal.): 0.57 Calculated purge volume (gal.) (3 x casing volume): 1.7
 One casing volume = $\pi \times [\text{casing radius (in.)} \times 1 \text{ ft}/12 \text{ in.}]^2 \times [\text{well depth (ft)} - \text{depth to water (ft)}] \times 7.48 \text{ gal/ft}^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): NA Method for checking: Interface probe Clear bailer

WELL PURGING

Date purged: 11-30-00 Start time: 0943 End time: 1034
 Purging equipment: Submersible pump Bladder pump Peristaltic pump
PVC bailer Teflon bailer Other
 Purge rate: 0.03 gpm Well yield (H/L): low
 Purge water disposal: Contained in 5 gallon pail onsite

Time (2400 hr)	Cumulative Vol. Purged (gal.)	pH (units)	EC (mS/cm)	T (°C)	Color (Visual)	Turbidity (Visual or NTU)
<u>1000</u>	<u>0.6</u>	<u>7.12</u>	<u>608</u>	<u>15.1</u>	<u>cloudy</u>	<u>36.4</u>
<u>1017</u>	<u>1.1</u>	<u>7.40</u>	<u>609</u>	<u>15.5</u>	<u>cloudy</u>	<u>60.8</u>
<u>1034</u>	<u>1.7</u>	<u>7.41</u>	<u>610</u>	<u>15.5</u>	<u>cloudy</u>	<u>42.7</u>
Total Purged (gal.): <u>1.7</u>						

WELL SAMPLING

Date sampled: 11-30-00 Start time: 1035 End time: 1037
 Depth to water (ft) before sampling: 13.43
 Sampling equipment: Peristaltic pump Bladder pump Teflon bailer
PVC bailer Other

Weather conditions: cloudy Ambient temperature (° F): 55
 Well condition/Remarks: Water in box above TOC. Cap secure, removed water before accessing well head. purged at slow rate to avoid dewatering well. Self observed at bottom of purge packet, well recharge rate slower than lowest pump setting. Collected all samples.

Meter calibration: EC 11-30-00 @ MW-2 pH _____
 Temperature _____ Turbidity _____
 Purged and sampled by (print): J. Butera Signature: [Signature] Reviewed by: [Signature] LDG

Appendix B

Certified Analytical Reports and Chain-of-Custody Documentation



April 12, 2000

Service Request No.: S2001084

Mr. Mark Wheeler
Crawford Consulting, Inc.
2 North First Street,
4th Floor
San Jose, CA 95113-1100

RE: Alameda Facility/CS1605

Dear Mr Wheeler:

Enclosed are the results of the sample(s) submitted to our laboratory on March 30, 2000. All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply to the sample(s) analyzed. Columbia Analytical Services is not responsible for use of less than the complete report. Signature of this CAS Analytical Report confirms that pages 2 through 10, following, have been thoroughly reviewed and approved for release.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 2352, expiration: January 31, 2001).

If you have any questions, please call me at (408) 748-9700.

Respectfully submitted,

Columbia Analytical Services, Inc.

Bernadette Troncales
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2001084
Date Collected: 03/30/00
Date Received: 03/30/00

Halogenated Volatile Organic Compounds

Sample Name: MW-3
Lab Code: S2001084-001
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	04/09/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	04/09/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Methylene Chloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
trans-1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
cis-1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromodichloromethane	EPA 5030	8260	5	1	NA	04/09/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromoform	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	1	1	NA	04/09/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	

Approved By: _____

PS

Date: _____

04/12/00

1344711470

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2001084
Date Collected: 03/30/00
Date Received: 03/30/00

Halogenated Volatile Organic Compounds

Sample Name: MW-2
Lab Code: S2001084-002
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	04/09/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	04/09/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Methylene Chloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	04/09/00	5.0	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	29	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	04/09/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	50	NA	04/10/00	3600	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromoform	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	

Approved By: _____



Date: _____

04/12/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2001084
Date Collected: 03/30/00
Date Received: 03/30/00

Halogenated Volatile Organic Compounds

Sample Name: MW-1
Lab Code: S2001084-003
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	04/09/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	04/09/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	04/09/00	13	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	1.4	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Methylene Chloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	0.8	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	0.6	
Chloroform	EPA 5030	8260	0.5	1	NA	04/09/00	1.6	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/10/00	150	
Trichloroethene (TCE)	EPA 5030	8260	0.5	20	NA	04/09/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	04/09/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	20	NA	04/10/00	1400	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromoform	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	

Approved By: _____

Handwritten signature

Date: _____

04/12/00

1044 111620

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2001084
Date Collected: 03/30/00
Date Received: 03/30/00

Halogenated Volatile Organic Compounds

Sample Name: EB-1
Lab Code: S2001084-004
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	04/09/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	04/09/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Methylene Chloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	04/09/00	1.6	X
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	04/09/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromoform	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	

X

Positive hit was confirmed by second run.

Approved By: _____

RT

Date: _____

04/12/00

1044111290

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2001084
Date Collected: NA
Date Received: NA

Halogenated Volatile Organic Compounds

Sample Name:
Lab Code:
Test Notes:

Method Blank(MS02)
S200409-WB1

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	04/09/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	04/09/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Methylene Chloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	04/09/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
Bromoform	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	04/09/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/09/00	ND	

Approved By: _____

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Date: _____

04/12/00

1599111290

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2001084
Date Collected: NA
Date Received: NA

Halogenated Volatile Organic Compounds

Sample Name:
Lab Code:
Test Notes:

Method Blank(MS02)
S200410-WB1

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	04/10/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	04/10/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Methylene Chloride	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	04/10/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
Bromoform	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	04/10/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/10/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/10/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	04/10/00	ND	

Approved By: _____

MT

Date: _____

04/12/00

Columbia Analytical Services

3334 Victor Court, Santa Clara, CA 95054
 (408) 748-9700 FAX (408) 748-9860

CHAIN OF CUSTODY / LABORATORY ANALYSIS REQUEST FORM

Service Request: **S2001084**

Date: **3/30/00**

Project Name: Alameda Facility
Project Number: CS1605
Project Manager: Mark Wheeler
Company/Address: Crawford Consulting, Inc.
 2 North First St, 4th Floor
 San Jose, CA 95113
Phone: (408) 287-9934
Fax: (408) 287-9937
Sampler's Signature: *J Butera*

Number of Containers	Analysis Requested											REMARKS			
	Metals (6010A)	500 ml plastic HNO ₃	Pb (7421); As (7060)	Same as Metals	COD, TKN	500 ml plastic H ₂ SO ₄	Chloride, Nitrate	500 ml plastic NP	pH, Conductivity	500 ml plastic NP	Total Phenols		2 x 500 ml glass H ₂ SO ₄	Volatile Organics (8010)	2 x 40 ml vial

Sample I.D.	Date	Time	LAB I.D.	Sample Matrix
MW-3	3/30/00	1134	①	H ₂ O
MW-2	↓	1244	②	↓
MW-1	↓	1404	③	↓
EB-1	↓	1036	④	↓

3													X			
3													X			
3													X			
3													X			

Relinquished By
 Signature: *J Butera*
 Printed Name: **J. Butera**
 Firm: **FBI**
 Date/Time: **3/30/00 1545**

Received By
 Signature: *Joseph Machado*
 Printed Name: **JOSEPH MACHADO**
 Firm: **CAS**
 Date/Time: **3/30/00 1545**

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 day
 Standard (10 working days)
 Provide Verbal Preliminary Results
 Provide FAX Preliminary Results
 Due Date: **4/13/00**

REPORT REQUIREMENTS
 I. Routine Report
 II. Report (includes DUP, MS MSD, as required, may be charged as samples)
 III. Data Validation Report (includes All Raw Data)
 RWQCB
 (MDLs/PQLs/TRACE#)

INVOICE INFORMATION
 P.O. # _____
 Bill to: _____

SAMPLE RECEIPT
 Shipping VIA: _____
 Shipping #: _____
 Condition: _____

Relinquished By
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

Received By
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

Special Instructions/Comments:
 List 8010 compounds only
 Please fax results to: **Dana Bergmann**
Crawford Consulting, Inc.
(408) 287-9937

RU/DI



June 2, 2000

Service Request No.: S2001523

Mr. Mark Wheeler
Crawford Consulting, Inc.
2 North First Street,
4th Floor
San Jose, CA 95113-1100

RE: Alameda Facility CS1605

Dear Mr Wheeler:

Enclosed are the results of the sample(s) submitted to our laboratory on May 16, 2000. All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply to the sample(s) analyzed. Columbia Analytical Services is not responsible for use of less than the complete report. Signature of this CAS Analytical Report confirms that pages 2 through 11, following, have been thoroughly reviewed and approved for release.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 2352, expiration: January 31, 2001).

If you have any questions, please call me at (408) 748-9700.

Respectfully submitted,

Columbia Analytical Services, Inc.

Bernadette Troncales
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTL	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility CS1605
Water

Service Request: S2001523
Date Collected: 5/16/00
Date Received: 5/16/00

EPA Method 8260
Volatile Organic Compounds

Units: ug/L (ppb)
Basis: NA

Sample Name: MW-2
Lab Code: S2001523-001
Test Notes: C1

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	50	NA	5/27/00	<50	
Chloromethane	EPA 5030	8260	1	50	NA	5/27/00	<50	
Vinyl Chloride	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
Bromomethane	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
Chloroethane	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
1,1-Dichloroethene	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	5	50	NA	5/27/00	<250	
Methylene Chloride	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
1,1-Dichloroethane	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
Chloroform	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
Carbon Tetrachloride	EPA 5030	8260	0.5	50	NA	5/27/00	53	
1,2-Dichloroethane	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
Trichloroethene (TCE)	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
1,2-Dichloropropane	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
Bromodichloromethane	EPA 5030	8260	5	50	NA	5/27/00	<250	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	100	NA	5/30/00	3200	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
Dibromochloromethane	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
Chlorobenzene	EPA 5030	8260	1	50	NA	5/27/00	<50	
Ethylbenzene	EPA 5030	8260	0.5	50	NA	5/27/00	<25	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	1	50	NA	5/27/00	<50	
1,3-Dichlorobenzene	EPA 5030	8260	1	50	NA	5/27/00	<50	
1,4-Dichlorobenzene	EPA 5030	8260	1	50	NA	5/27/00	<50	
1,2-Dichlorobenzene	EPA 5030	8260	1	50	NA	5/27/00	<50	

C1

The MRL was elevated due to high analyte concentration requiring sample dilution.

Approved By: _____

[Signature]

Date: 06/01/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility CS1605
Water

Service Request: S2001523
Date Collected: 5/16/00
Date Received: 5/16/00

EPA Method 8260
Volatile Organic Compounds

Sample Name: MW-3
Lab Code: S2001523-002
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	5/28/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	5/28/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	5	1	NA	5/28/00	ND	
Methylene Chloride	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Bromodichloromethane	EPA 5030	8260	5	1	NA	5/28/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Chlorobenzene	EPA 5030	8260	1	1	NA	5/28/00	ND	
Ethylbenzene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	1	1	NA	5/28/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/28/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/28/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/28/00	ND	

Approved By: _____

Date: _____

06/01/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility CS1605
Water

Service Request: S2001523
Date Collected: 5/16/00
Date Received: 5/16/00

EPA Method 8260
Volatile Organic Compounds

Sample Name: MW-1
Lab Code: S2001523-003
Test Notes: C1

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	20	NA	5/27/00	<20	
Chloromethane	EPA 5030	8260	1	20	NA	5/27/00	<20	
Vinyl Chloride	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
Bromomethane	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
Chloroethane	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
1,1-Dichloroethene	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	5	20	NA	5/27/00	<100	
Methylene Chloride	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
1,1-Dichloroethane	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
Chloroform	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
Carbon Tetrachloride	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
1,2-Dichloroethane	EPA 5030	8260	0.5	20	NA	5/27/00	190	
Trichloroethene (TCE)	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
1,2-Dichloropropane	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
Bromodichloromethane	EPA 5030	8260	5	20	NA	5/27/00	<100	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	20	NA	5/27/00	1900	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
Dibromochloromethane	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
Chlorobenzene	EPA 5030	8260	1	20	NA	5/27/00	<20	
Ethylbenzene	EPA 5030	8260	0.5	20	NA	5/27/00	<10	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	1	20	NA	5/27/00	<20	
1,3-Dichlorobenzene	EPA 5030	8260	1	20	NA	5/27/00	<20	
1,4-Dichlorobenzene	EPA 5030	8260	1	20	NA	5/27/00	<20	
1,2-Dichlorobenzene	EPA 5030	8260	1	20	NA	5/27/00	<20	

C1

The MRL was elevated due to high analyte concentration requiring sample dilution.

Approved By: _____

[Signature]

Date: _____

06/01/00

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility CS1605
Water

Service Request: S2001523
Date Collected: 5/16/00
Date Received: 5/16/00

EPA Method 8260
Volatile Organic Compounds

Sample Name: DUP-1
Lab Code: S2001523-004
Test Notes: C1

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	20	NA	5/30/00	<20	
Chloromethane	EPA 5030	8260	1	20	NA	5/30/00	<20	
Vinyl Chloride	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
Bromomethane	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
Chloroethane	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
1,1-Dichloroethene	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
Methylene Chloride	EPA 5030	8260	5	20	NA	5/30/00	<100	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
1,1-Dichloroethane	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
Chloroform	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
Carbon Tetrachloride	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
1,2-Dichloroethane	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
Trichloroethene (TCE)	EPA 5030	8260	0.5	20	NA	5/30/00	160	
1,2-Dichloropropane	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
Bromodichloromethane	EPA 5030	8260	0.5	20	NA	5/30/00	<100	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	20	NA	5/30/00	<10	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	20	NA	5/30/00	1100	
Dibromochloromethane	EPA 5030	8260	0.5	20	NA	5/30/00	<10	
Chlorobenzene	EPA 5030	8260	0.5	20	NA	5/30/00	<20	
Ethylbenzene	EPA 5030	8260	1	20	NA	5/30/00	<10	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	20	NA	5/30/00	<20	
1,3-Dichlorobenzene	EPA 5030	8260	1	20	NA	5/30/00	<20	
1,4-Dichlorobenzene	EPA 5030	8260	1	20	NA	5/30/00	<20	
1,2-Dichlorobenzene	EPA 5030	8260	1	20	NA	5/30/00	<20	

C1

The MRL was elevated due to high analyte concentration requiring sample dilution.

Approved By: _____

Handwritten signature

Date: _____

06/01/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility CS1605
Water

Service Request: S2001523
Date Collected: NA
Date Received: NA

EPA Method 8260
Volatile Organic Compounds

Sample Name:
Lab Code:
Test Notes:

Method Blank (MS02)
S200527-WB1

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	5/27/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	5/27/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Methylene Chloride	EPA 5030	8260	5	1	NA	5/27/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	5/27/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
Ethylbenzene	EPA 5030	8260	1	1	NA	5/27/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	5/27/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/27/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/27/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/27/00	ND	

Approved By: _____

[Signature]

Date: _____

06/01/02

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility CS1605
Water

Service Request: S2001523
Date Collected: NA
Date Received: NA

EPA Method 8260
Volatile Organic Compounds

Sample Name:
Lab Code:
Test Notes:

Method Blank (MS01)
S200530-WB1

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	5/30/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	5/30/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Methylene Chloride	EPA 5030	8260	5	1	NA	5/30/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	5/30/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
Ethylbenzene	EPA 5030	8260	1	1	NA	5/30/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	5/30/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/30/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/30/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/30/00	ND	

Approved By: _____

ht

Date: _____

06/01/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility CS1605
Water

Service Request: S2001523
Date Collected: NA
Date Received: NA

EPA Method 8260
Volatile Organic Compounds

Sample Name:
Lab Code:
Test Notes:

Method Blank (MS04)
S200528-WB1

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	5/28/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	5/28/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Methylene Chloride	EPA 5030	8260	5	1	NA	5/28/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	5/28/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
Ethylbenzene	EPA 5030	8260	1	1	NA	5/28/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	5/28/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/28/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/28/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	5/28/00	ND	

Approved By: _____

PS

Date: _____

06/01/00

1044111270

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Crawford Consulting, Inc.
 Project: Alameda Facility CS1605
 Sample Matrix: Water

Service Request: S2001523
 Date Collected: NA
 Date Received: NA
 Date Extracted: NA
 Date Analyzed: 5/27/00

Matrix Spike/Duplicate Matrix Spike Summary
 Volatile Organic Compounds

Sample Name: MW-3
 Lab Code: S2001523-002MS S2001523-002DMS
 Test Notes:

Units: ug/L (ppb)
 Basis: NA

Percent Recovery

Analyte	Prep Method	Analysis Method	Spike Level			Sample Result	Spike Result		Percent Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
			MRL	MS	DMS		MS	DMS	MS	DMS			
1,1-Dichloroethene	EPA 5030	8260	0.5	10	10	ND	10	11	100	110	62-145	10	
Benzene	EPA 5030	8260	0.5	10	10	ND	11	11	110	110	77-127	<1	
Trichloroethene	EPA 5030	8260	0.5	10	10	ND	11	10	110	100	71-119	10	
Toluene	EPA 5030	8260	0.5	10	10	ND	11	10	110	100	76-124	10	
Chlorobenzene	EPA 5030	8260	0.5	10	10	ND	11	11	110	110	75-127	<1	

Approved By: _____



Date: _____

06/01/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Crawford Consulting, Inc.
 Project: Alameda Facility CS1605
 Sample Matrix: Water

Service Request: S2001523
 Date Collected: NA
 Date Received: NA
 Date Extracted: NA
 Date Analyzed: NA

Surrogate Recovery Summary
 Volatile Organic Compounds

Prep Method: EPA 5030
 Analysis Method: 8260

Units: PERCENT
 Basis: NA

Sample Name	Lab Code	Test Notes	P e r c e n t R e c o v e r y		
			Dibromofluoromethane	Toluene-D8	4-Bromofluorobenzene
MW-2	S2001523-001		100	99	112
MW-3	S2001523-002		90	96	99
MW-1	S2001523-003		114	112	112
DUP-1	S2001523-004		101	102	102
Method Blank (MS02)	S200527-WB1		89	94	88
Method Blank (MS01)	S200530-WB1		118	88	121
Method Blank (MS04)	S200528-WB1		114	118	115
MW-3	S2001523-002MS		92	96	95
MW-3	S2001523-002DMS		95	96	93

CAS Acceptance Limits: 57-167 62-138 62-140

Approved By: _____

PS

Date: _____

06/01/05



August 8, 2000

Service Request No.: S2002130

Mr. Mark Wheeler
Crawford Consulting, Inc.
2 North First Street,
4th Floor
San Jose, CA 95113-1100

RE: Alameda Facility/CS1605

Dear Mr Wheeler:


Enclosed are the results of the sample(s) submitted to our laboratory on July 28, 2000. All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply to the sample(s) analyzed. Columbia Analytical Services is not responsible for use of less than the complete report. Signature of this CAS Analytical Report confirms that pages 2 through 11, following, have been thoroughly reviewed and approved for release.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 2352, expiration: January 31, 2001).

If you have any questions, please call me at (408) 748-9700.

Respectfully submitted,

Columbia Analytical Services, Inc.


Greg Jordan
Laboratory Director

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration-Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL).
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons.
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford-Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2002130
Date Collected: 7/28/00
Date Received: 7/28/00

EPA Method 8260
Volatile Organic Compounds

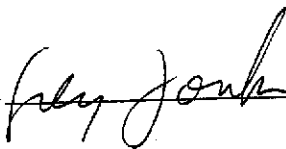
Sample Name: MW-1
Lab Code: S2002130-001
Test Notes: C2

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	20	NA	8/7/00	<20	
Chloromethane	EPA 5030	8260	1	20	NA	8/7/00	<20	
Vinyl Chloride	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
Bromomethane	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
Chloroethane	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	20	NA	8/7/00	15	
1,1-Dichloroethene	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	5	20	NA	8/7/00	<100	
Methylene Chloride	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
1,1-Dichloroethane	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
Chloroform	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
Carbon Tetrachloride	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
1,2-Dichloroethane	EPA 5030	8260	0.5	20	NA	8/7/00	170	
Trichloroethene (TCE)	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
1,2-Dichloropropane	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
Bromodichloromethane	EPA 5030	8260	5	20	NA	8/7/00	<100	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	20	NA	8/7/00	1200	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
Dibromochloromethane	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
Chlorobenzene	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
Bromoform	EPA 5030	8260	0.5	20	NA	8/7/00	<10	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	1	20	NA	8/7/00	<20	
1,3-Dichlorobenzene	EPA 5030	8260	1	20	NA	8/7/00	<20	
1,4-Dichlorobenzene	EPA 5030	8260	1	20	NA	8/7/00	<20	
1,2-Dichlorobenzene	EPA 5030	8260	1	20	NA	8/7/00	<20	

C2

MRL is elevated because the sample required diluting.

Approved By: 

Date: 8/8/00

1344/111290

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2002130
Date Collected: 7/28/00
Date Received: 7/28/00

EPA Method 8260
Volatile Organic Compounds

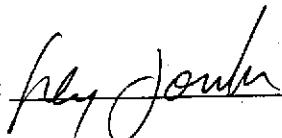
Sample Name: MW-2
Lab Code: S2002130-002
Test Notes: C2

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	50	NA	8/7/00	<50	
Chloromethane	EPA 5030	8260	1	50	NA	8/7/00	<50	
Vinyl Chloride	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
Bromomethane	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
Chloroethane	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
1,1-Dichloroethene	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	50	NA	8/7/00	<250	
Methylene Chloride	EPA 5030	8260	5	50	NA	8/7/00	<25	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
1,1-Dichloroethane	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
Chloroform	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
Carbon Tetrachloride	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
1,2-Dichloroethane	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
Trichloroethene (TCE)	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
1,2-Dichloropropane	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
Bromodichloromethane	EPA 5030	8260	0.5	50	NA	8/7/00	<250	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	50	NA	8/7/00	<25	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	50	NA	8/7/00	3300	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
Dibromochloromethane	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
Chlorobenzene	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
Bromoform	EPA 5030	8260	0.5	50	NA	8/7/00	<25	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	50	NA	8/7/00	<50	
1,3-Dichlorobenzene	EPA 5030	8260	1	50	NA	8/7/00	<50	
1,4-Dichlorobenzene	EPA 5030	8260	1	50	NA	8/7/00	<50	
1,2-Dichlorobenzene	EPA 5030	8260	1	50	NA	8/7/00	<50	

C2

MRL is elevated because the sample required diluting.

Approved By: 

Date: 8/8/00

15440111290

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2002130
Date Collected: 7/28/00
Date Received: 7/28/00

EPA Method 8260
Volatile Organic Compounds

Sample Name: MW-3
Lab Code: S2002130-003
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	8/8/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	8/8/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Methylene Chloride	EPA 5030	8260	5	1	NA	8/8/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	8/8/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	8/8/00	0.8	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Bromoform	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/8/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/8/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/8/00	ND	

Approved By: *Ray Jones*

Date: *8/8/00*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2002130
Date Collected: 7/28/00
Date Received: 7/28/00

EPA Method 8260
Volatile Organic Compounds

Sample Name: DUP-1
Lab Code: S2002130-004
Test Notes: C2

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	20	NA	8/8/00	<20	
Chloromethane	EPA 5030	8260	1	20	NA	8/8/00	<20	
Vinyl Chloride	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
Bromomethane	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
Chloroethane	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
1,1-Dichloroethene	EPA 5030	8260	0.5	20	NA	8/8/00	14	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
Methylene Chloride	EPA 5030	8260	5	20	NA	8/8/00	<100	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
1,1-Dichloroethane	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
Chloroform	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
Carbon Tetrachloride	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
1,2-Dichloroethane	EPA 5030	8260	0.5	20	NA	8/8/00	170	
Trichloroethene (TCE)	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
1,2-Dichloropropane	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
Bromodichloromethane	EPA 5030	8260	0.5	20	NA	8/8/00	<100	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	20	NA	8/8/00	<10	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	20	NA	8/8/00	1200	
Dibromochloromethane	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
Chlorobenzene	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
Bromoform	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	20	NA	8/8/00	<10	
1,3-Dichlorobenzene	EPA 5030	8260	1	20	NA	8/8/00	<20	
1,4-Dichlorobenzene	EPA 5030	8260	1	20	NA	8/8/00	<20	
1,2-Dichlorobenzene	EPA 5030	8260	1	20	NA	8/8/00	<20	

C2 -

MRL is elevated because the sample required diluting.

Approved By:

Hej Jonh

Date:

8/8/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2002130
Date Collected: NA
Date Received: NA

EPA Method 8260
Volatile Organic Compounds

Sample Name:
Lab Code:
Test Notes:

Method Blank(MS02)
S200807-WB1

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	8/7/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	8/7/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Methylene Chloride	EPA 5030	8260	5	1	NA	8/7/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	8/7/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Bromoform	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/7/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/7/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/7/00	ND	

Approved By: Ray Jones

Date: 8/8/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2002130
Date Collected: NA
Date Received: NA

EPA Method 8260
Volatile Organic Compounds

Sample Name:
Lab Code:
Test Notes:

Method Blank(MS02)
S200807-WB2

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	8/7/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	8/7/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Methylene Chloride	EPA 5030	8260	5	1	NA	8/7/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	8/7/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Dibromochloromethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
Bromoform	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	8/7/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/7/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/7/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/7/00	ND	

Approved By: *Grey Joubert*

Date: *8/8/00*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

Crawford Consulting, Inc.
Alameda Facility/CS1605
Water

Service Request: S2002130
Date Collected: NA
Date Received: NA

EPA Method 8260
Volatile Organic Compounds

Sample Name: Method Blank(MS02)
Lab Code: S200808-WB1
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Dichlorodifluoromethane (CFC 12)	EPA 5030	8260	1	1	NA	8/8/00	ND	
Chloromethane	EPA 5030	8260	1	1	NA	8/8/00	ND	
Vinyl Chloride	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Bromomethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Chloroethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,1-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Methylene Chloride	EPA 5030	8260	5	1	NA	8/8/00	ND	
trans-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
cis-1,2-Dichloroethene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,1-Dichloroethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Chloroform	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Carbon Tetrachloride	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Benzene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,2-Dichloroethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Trichloroethene (TCE)	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,2-Dichloropropane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Bromodichloromethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260	5	1	NA	8/8/00	ND	
trans-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Toluene	EPA 5030	8260	1	1	NA	8/8/00	ND	
cis-1,3-Dichloropropene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,1,2-Trichloroethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Tetrachloroethene (PCE)	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Bromoform	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Chlorobenzene	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
Ethylbenzene	EPA 5030	8260	1	1	NA	8/8/00	ND	
Total Xylenes	EPA 5030	8260	1	1	NA	8/8/00	ND	
Bromoform	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260	0.5	1	NA	8/8/00	ND	
1,3-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/8/00	ND	
1,4-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/8/00	ND	
1,2-Dichlorobenzene	EPA 5030	8260	1	1	NA	8/8/00	ND	

Approved By: *frey joubert*

Date: *8/8/00*

15440111270

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Crawford Consulting, Inc.
 Project: Alameda Facility/CS1605
 Sample Matrix: Water

Service Request: S2002130
 Date Collected: NA
 Date Received: NA
 Date Extracted: NA
 Date Analyzed: 8/7/00

Matrix Spike/Duplicate Matrix Spike Summary
 Volatile Organic Compounds

Sample Name: BATCH QC
 Lab Code: S2002122-002MS, S2002122-002DMS
 Test Notes:

Units: ug/L (ppb)
 Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Percent Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
1,1-Dichloroethene	EPA 5030	8260	0.5	20.0	20.0	3.91	24.0	22.4	100	92	62-145	7	
Benzene	EPA 5030	8260	0.5	20.0	20.0	ND	23.6	22.0	118	110	77-127	7	
Trichloroethene	EPA 5030	8260	0.5	20.0	20.0	7.99	31.6	29.9	118	110	71-119	6	
Toluene	EPA 5030	8260	0.5	20.0	20.0	ND	22.4	21.0	112	105	76-124	6	
Chlorobenzene	EPA 5030	8260	0.5	20.0	20.0	ND	23.6	22.2	118	111	75-127	6	

Approved By: Key Joub Date: 8/8/00

DMS/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Crawford Consulting, Inc.
Project: Alameda Facility/CS1605
Sample Matrix: Water

Service Request: S2002130
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
Volatile Organic Compounds

Prep Method: EPA 5030
Analysis Method: 8260

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery		
			Dibromofluoromethane	Toluene-D8	4-Bromofluorobenzene
MW-1	S2002130-001		90	97	88
MW-2	S2002130-002		88	96	89
MW-3	S2002130-003		99	109	96
DUP-1	S2002130-004		88	96	87
BATCH QC	S2002122-002MS		91	101	98
BATCH QC	S2002122-002DMS		92	102	98
Method Blank(MS02)	S200807-WB1		89	98	90
Method Blank(MS02)	S200807-WB2		94	99	93
Method Blank(MS02)	S200808-WB1		91	107	97

CAS Acceptance Limits: 57-167 62-138 62-140

Approved By: _____

Greg Joubert

Date: _____

5/8/00



3334 Victor Court • Santa Clara, CA 95054
 (408) 748-9700 • FAX (408) 748-9860

CHAIN OF CUSTODY/LABORATORY ANALYSIS REPORT FORM

SERVICE REQUEST NO. S2002130 P.O.# _____ PAGE 1 OF 1

PROJECT NAME Alameda Facility CS 1605
 PROJECT MGR. M. Wheeler
 COMPANY Crawford Consulting, Inc.
 ADDRESS 2 North First St 4th Floor
SUN JOSE, CA 95113 PHONE 287-9934
 FAX 287-9937

PRESERVATIVE	ANALYSIS REQUESTED														REMARKS *
	HCl	HCl	HCl	NP	NP	NP	HCl	HNO ₃	NP	H ₂ SO ₄	NaOH				
Volatiles Organics BY GCMS 664-1 <input type="checkbox"/> 8240 <input type="checkbox"/> 9966 <input type="checkbox"/> 8010 <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Halogenated or Aromatic Volatiles 601/8010 <input type="checkbox"/> 602/8020 <input type="checkbox"/> 8021 <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
TPH as Gas/BTEX <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
TPH as Gas/BTEX/MTBE <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HBHC <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Base/New/Acid Organics / GCMS 625 <input type="checkbox"/> 8270 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Pesticides & PCBs 608/8082 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Pesticides only 8081 <input type="checkbox"/> PCBs 8082 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
TRPH - 418.1 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Oil and Grease Method Metals Total <input type="checkbox"/> Indicate below	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
pH, Cond, Cl, SO ₄ , F, TDS, TSS Alk, NO ₃ , NO ₂ (circle)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
NH ₃ -N, COD, Total-P, TKN, TOC NO ₃ /NO ₂ , Phenols (circle)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cyanide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

SAMPLER'S SIGNATURE	SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS
	MW-1	7/28/00	13:26	①	Water	3
	MW-2	7/28/00	11:00	②	↓	3
	MW-3	7/28/00	12:46	③	↓	3
	DUP-1	7/28/00	—	④	↓	3

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: M. MARTIN
 Firm: F3I
 Date/Time: 7/28/00 15:38

RECEIVED BY:
 Signature: [Signature]
 Printed Name: JOSEPH MACHADO
 Firm: CAS
 Date/Time: 7/28/00 1538

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

TURNAROUND REQUIREMENTS
 ___ 1 day ___ 2 day ___ 3 day
 ___ 5 day ___ Other
 Standard (10 working days)
 Results Due: 8/11/00

REPORT REQUIREMENTS
 I. Routine Report
 II. Report (includes MS, MSD, as required, may be charged as samples)
 III. Data Validation Report (includes All Raw Data)
 ___ MDLs/PQLs/Trace #
 ___ Electronic Data Deliverables

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

SAMPLE RECEIPT: Condition _____ Custody Seals _____
 SPECIAL INSTRUCTIONS/COMMENTS: List 8010 compounds only
 Circle which metals are to be analyzed:
 Metals: Al Sb Ba Be B Cd Ca Cr Cu Fe Mg Mn Mo Ni K Ag Na Sn V Zn
As Pb Se Ti Hg
Please fax results to: Dana Bergman at above listed fax #
 Storage: R11/D1-T

*Will sample results be used in connection with drinking water regulations? Yes No If yes, you must so indicate by writing "DW" for each such sample.



Curtis & Tompkins, Ltd., Analytical Laboratories. Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

Crawford Consulting, Inc.
2 North First St.
4th Floor
San Jose, CA 95113

Date: 13-DEC-00
Lab Job Number: 148943
Project ID: CS1605
Location: Alameda Facility

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis.

Reviewed by: Paul Prndergast
Project Manager

Reviewed by: [Signature]
Operations Manager

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CHAIN OF CUSTODY FORM

Analyses

Curtis & Tompkins, Ltd.
 Analytical Laboratory Since 1878
 2323 Fifth Street
 Berkeley, CA 94710
 (510)486-0900 Phone
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C&T LOGIN # 148943

Project No: CS1605
 Project Name: Alameda Facility
 Project P.O.:
 Turnaround Time: Standard

Sampler: J. Butera
 Report To: M. Wheeler
 Company: Crawford Consulting
 Telephone: (408) 287-9934
 Fax: (408) 287-9937

Laboratory Number	Sample ID.	Sampling Date Time	Matrix			# of Containers	Preservative				Field Notes
			Soil	Water	Waste		HCL	H ₂ SO ₄	HNO ₃	ICE	
-1	MW-1	11/30/00 1118		X		3	X			X	
-2	MW-2	0934		X		3	X			X	
-3	MW-3	1035		X		3	X			X	
-4	DUP-1	-		X		3	X			X	
For Laboratory Use											

VOC 80/D
XXXX

Notes:

Received Cold
 On Ice
 Ambient
 Intact

Preservation Correct?
 Yes
 No
 N/A

Signature

RELINQUISHED BY:	RECEIVED BY:
<u>J. Butera</u>	<u>K. Wheeler</u>
11-30-00 12:00	11/30/00 12:20
DATE/TIME	DATE/TIME
DATE/TIME	DATE/TIME
DATE/TIME	DATE/TIME

Purgeable Halocarbons by GC/MS

Lab #:	148943	Location:	Alameda Facility
Client:	Crawford Consulting, Inc.	Prep:	EPA 5030
Project#:	CS1605	Analysis:	EPA 8260B
Field ID:	MW-1	Batch#:	60025
Lab ID:	148943-001	Sampled:	11/30/00
Matrix:	Water	Received:	11/30/00
Units:	ug/L	Analyzed:	12/06/00
Diln Fac:	8.333		

Analyte	Result	RL
Chloromethane	ND	8.3
Vinyl Chloride	ND	8.3
Bromomethane	ND	8.3
Chloroethane	ND	8.3
Trichlorofluoromethane	ND	4.2
Freon 113	ND	8.3
1,1-Dichloroethene	14	4.2
Methylene Chloride	ND	170
trans-1,2-Dichloroethene	ND	4.2
1,1-Dichloroethane	ND	4.2
cis-1,2-Dichloroethene	ND	4.2
Chloroform	ND	8.3
1,1,1-Trichloroethane	ND	4.2
Carbon Tetrachloride	ND	4.2
1,2-Dichloroethane	ND	4.2
Trichloroethene	130	4.2
1,2-Dichloropropane	ND	4.2
Bromodichloromethane	ND	4.2
cis-1,3-Dichloropropene	ND	4.2
trans-1,3-Dichloropropene	ND	4.2
1,1,2-Trichloroethane	ND	4.2
Tetrachloroethene	880	4.2
Dibromochloromethane	ND	4.2
Chlorobenzene	ND	4.2
Bromoform	ND	4.2
1,1,2,2-Tetrachloroethane	ND	4.2
1,3-Dichlorobenzene	ND	4.2
1,4-Dichlorobenzene	ND	4.2
1,2-Dichlorobenzene	ND	4.2

Surrogate	SRBC	Limits
1,2-Dichloroethane-d4	86	78-123
Toluene-d8	101	80-110
Bromofluorobenzene	98	80-115



Purgeable Halocarbons by GC/MS

Lab #:	148943	Location:	Alameda Facility
Client:	Crawford Consulting, Inc.	Prep:	EPA 5030
Project#:	CS1605	Analysis:	EPA 8260B
Field ID:	MW-2	Batch#:	60025
Lab ID:	148943-002	Sampled:	11/30/00
Matrix:	Water	Received:	11/30/00
Units:	ug/L	Analyzed:	12/06/00
Diln Fac:	16.67		

Analyte	Result	RL
Chloromethane	ND	17
Vinyl Chloride	ND	17
Bromomethane	ND	17
Chloroethane	ND	17
Trichlorofluoromethane	ND	8.3
Freon 113	ND	17
1,1-Dichloroethene	ND	8.3
Methylene Chloride	ND	330
trans-1,2-Dichloroethene	ND	8.3
1,1-Dichloroethane	ND	8.3
cis-1,2-Dichloroethene	ND	8.3
Chloroform	ND	17
1,1,1-Trichloroethane	ND	8.3
Carbon Tetrachloride	ND	8.3
1,2-Dichloroethane	ND	8.3
Trichloroethene	20	8.3
1,2-Dichloropropane	ND	8.3
Bromodichloromethane	ND	8.3
cis-1,3-Dichloropropene	ND	8.3
trans-1,3-Dichloropropene	ND	8.3
1,1,2-Trichloroethane	ND	8.3
Tetrachloroethene	1,700	8.3
Dibromochloromethane	ND	8.3
Chlorobenzene	ND	8.3
Bromoform	ND	8.3
1,1,2,2-Tetrachloroethane	ND	8.3
1,3-Dichlorobenzene	ND	8.3
1,4-Dichlorobenzene	ND	8.3
1,2-Dichlorobenzene	ND	8.3

Surrogate	MRRC	Limits
1,2-Dichloroethane-d4	90	78-123
Toluene-d8	100	80-110
Bromofluorobenzene	98	80-115

Purgeable Halocarbons by GC/MS

Lab #:	148943	Location:	Alameda Facility
Client:	Crawford Consulting, Inc.	Prep:	EPA 5030
Project#:	CS1605	Analysis:	EPA 8260B
Field ID:	MW-3	Batch#:	60025
Lab ID:	148943-003	Sampled:	11/30/00
Matrix:	Water	Received:	11/30/00
Units:	ug/L	Analyzed:	12/06/00
Diln Fac:	1.000		

Analyte	Result	RL
Chloromethane	ND	1.0
Vinyl Chloride	ND	1.0
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	0.5
Freon 113	ND	1.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	20
trans-1,2-Dichloroethene	ND	0.5
1,1-Dichloroethane	ND	0.5
cis-1,2-Dichloroethene	ND	0.5
Chloroform	ND	1.0
1,1,1-Trichloroethane	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
cis-1,3-Dichloropropene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
Tetrachloroethene	ND	0.5
Dibromochloromethane	ND	0.5
Chlorobenzene	ND	0.5
Bromoform	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5

Surrogate	IRRC	Limits
1,2-Dichloroethane-d4	88	78-123
Toluene-d8	101	80-110
Bromofluorobenzene	97	80-115

ND = Not Detected
 RL = Reporting Limit
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Purgeable Halocarbons by GC/MS

Lab #:	148943	Location:	Alameda Facility
Client:	Crawford Consulting, Inc.	Prep:	EPA 5030
Project#:	CS1605	Analysis:	EPA 8260B
Field ID:	DUP-1	Batch#:	60025
Lab ID:	148943-004	Sampled:	11/30/00
Matrix:	Water	Received:	11/30/00
Units:	ug/L	Analyzed:	12/06/00
Diln Fac:	8.333		

Analyte	Result	RL
Chloromethane	ND	8.3
Vinyl Chloride	ND	8.3
Bromomethane	ND	8.3
Chloroethane	ND	8.3
Trichlorofluoromethane	ND	4.2
Freon 113	ND	8.3
1,1-Dichloroethene	16	4.2
Methylene Chloride	ND	170
trans-1,2-Dichloroethene	ND	4.2
1,1-Dichloroethane	ND	4.2
cis-1,2-Dichloroethene	ND	4.2
Chloroform	ND	8.3
1,1,1-Trichloroethane	ND	4.2
Carbon Tetrachloride	ND	4.2
1,2-Dichloroethane	ND	4.2
Trichloroethene	140	4.2
1,2-Dichloropropane	ND	4.2
Bromodichloromethane	ND	4.2
cis-1,3-Dichloropropene	ND	4.2
trans-1,3-Dichloropropene	ND	4.2
1,1,2-Trichloroethane	ND	4.2
Tetrachloroethene	920	4.2
Dibromochloromethane	ND	4.2
Chlorobenzene	ND	4.2
Bromoform	ND	4.2
1,1,2,2-Tetrachloroethane	ND	4.2
1,3-Dichlorobenzene	ND	4.2
1,4-Dichlorobenzene	ND	4.2
1,2-Dichlorobenzene	ND	4.2

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	89	78-123
Toluene-d8	101	80-110
Bromofluorobenzene	99	80-115

Purgeable Halocarbons by GC/MS

Lab #:	148943	Location:	Alameda Facility
Client:	Crawford Consulting, Inc.	Prep:	EPA 5030
Project#:	CS1605	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC131947	Batch#:	60025
Matrix:	Water	Analyzed:	12/06/00
Units:	ug/L		

Analyte	Result	RL
Chloromethane	ND	1.0
Vinyl Chloride	ND	1.0
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	0.5
Freon 113	ND	1.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	20
trans-1,2-Dichloroethene	ND	0.5
1,1-Dichloroethane	ND	0.5
cis-1,2-Dichloroethene	ND	0.5
Chloroform	ND	1.0
1,1,1-Trichloroethane	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
cis-1,3-Dichloropropene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
Tetrachloroethene	ND	0.5
Dibromochloromethane	ND	0.5
Chlorobenzene	ND	0.5
Bromoform	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5

Surrogate	IRSC	Limits
1,2-Dichloroethane-d4	88	78-123
Toluene-d8	102	80-110
Bromofluorobenzene	96	80-115

**Purgeable Halocarbons by GC/MS**

Lab #:	148943	Location:	Alameda Facility
Client:	Crawford Consulting, Inc.	Prep:	EPA 5030
Project#:	CS1605	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC131948	Batch#:	60025
Matrix:	Water	Analyzed:	12/06/00
Units:	ug/L		

Analyte	Result	RL
Chloromethane	ND	1.0
Vinyl Chloride	ND	1.0
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	0.5
Freon 113	ND	1.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	20
trans-1,2-Dichloroethene	ND	0.5
1,1-Dichloroethane	ND	0.5
cis-1,2-Dichloroethene	ND	0.5
Chloroform	ND	1.0
1,1,1-Trichloroethane	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
cis-1,3-Dichloropropene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
Tetrachloroethene	ND	0.5
Dibromochloromethane	ND	0.5
Chlorobenzene	ND	0.5
Bromoform	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5

Surrogate	IREC	Limits
1,2-Dichloroethane-d4	88	78-123
Toluene-d8	100	80-110
Bromofluorobenzene	98	80-115

ND = Not Detected

RL = Reporting Limit

**Purgeable Halocarbons by GC/MS**

Lab #:	148943	Location:	Alameda Facility
Client:	Crawford Consulting, Inc.	Prep:	EPA 5030
Project#:	CS1605	Analysis:	EPA 8260B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC131946	Batch#:	60025
Matrix:	Water	Analyzed:	12/06/00
Units:	ug/L		

Analyte	Spiked	Result	MRSL	Limits
1,1-Dichloroethene	50.00	65.29	131	74-132
Trichloroethene	50.00	48.84	98	80-119
Chlorobenzene	50.00	47.35	95	80-117

Surrogate	MRSL	Limits
1,2-Dichloroethane-d4	88	78-123
Toluene-d8	100	80-110
Bromofluorobenzene	97	80-115

**Purgeable Halocarbons by GC/MS**

Lab #:	148943	Location:	Alameda Facility
Client:	Crawford Consulting, Inc.	Prep:	EPA 5030
Project#:	CS1605	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZ	Batch#:	60025
MSS Lab ID:	148963-005	Sampled:	11/30/00
Matrix:	Water	Received:	11/30/00
Units:	ug/L	Analyzed:	12/06/00
Diln Fac:	1.000		

Type: MS Lab ID: QC131949

Analyte	MSS Result	Spiked	Result	UREC	Limits
1,1-Dichloroethene	<0.5000	50.00	64.17	128	70-132
Trichloroethene	7.662	50.00	57.89	100	62-137
Chlorobenzene	<0.5000	50.00	48.35	97	80-117

Surrogate	UREC	Limits
1,2-Dichloroethane-d4	89	78-123
Toluene-d8	102	80-110
Bromofluorobenzene	96	80-115

Type: MSD Lab ID: QC131950

Analyte	Spiked	Result	UREC	Limits	RPD	Lim
1,1-Dichloroethene	50.00	65.83	132	70-132	3	20
Trichloroethene	50.00	59.07	103	62-137	2	20
Chlorobenzene	50.00	49.00	98	80-117	1	20

Surrogate	UREC	Limits
1,2-Dichloroethane-d4	88	78-123
Toluene-d8	101	80-110
Bromofluorobenzene	98	80-115