Cargill

November 13, 2013

Alameda County Environmental Health Services
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577
Attn: Jerry Wickham

RE: Groundwater Monitoring Results, Second Semi-Annual 2013 Monitoring Period,
Cargill Salt – Alameda Facility, Alameda, California,
SLIC Case No. RO0002480

Dear Mr. Wickham,

The attached report presents the groundwater monitoring results for the second semi-annual 2013 monitoring period for the Cargill Salt Alameda facility. The report presents the results of groundwater monitoring data collected during the third quarter of 2013. For three of the four monitoring wells, groundwater levels in the site monitoring wells were measured, groundwater samples were collected and analyzed, and the groundwater flow direction and gradient were determined. The well casing of one well has been damaged by tree roots and was unavailable for water-level measurement or sampling. We are looking at options for repair of the well.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report are true and correct to the best of my knowledge.

Should you have any questions concerning the report, please don't hesitate to call me at (510) 790-8182.

Sincerely,

Sean Riley
Environmental Manager
Cargill

Groundwater Monitoring Results
Second Semi-Annual 2013 Monitoring Period
Cargill Salt – Alameda Facility
Alameda, California

CRAWFORD
CONSULTING
INC.

Groundwater Monitoring Results
Second Semi-Annual 2013 Monitoring Period
Cargill Salt – Alameda Facility
Alameda, California

Prepared for:

Cargill Salt
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Newark, California 94560

Prepared by:

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Project No. CS1605
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Contents

Tables

Illustrations

Appendices

(presented in electronic format only)

Electronic File

Entire report presented in electronic file format (pdf) on CD-ROM inside back cover.

1 Introduction

Crawford Consulting, Inc. (Crawford) 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 three 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 purpose of the groundwater transect sampling and the monitoring well installation and sampling was 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. Cargill Salt began groundwater monitoring on a quarterly basis after the initial groundwater monitoring well sampling event in November 1999. For 2000 through 2005, reporting was performed on an annual basis. Cargill Salt began reporting on a semi-annual basis in 2006.

Cargill Salt conducted additional characterization activities in November and December 2001 to evaluate the off-site extent of VOCs in the soil and groundwater. Soil and groundwater samples were collected and analyzed from a neighboring residential property and along Clement Avenue, slug tests were performed in the three existing monitoring wells, and a groundwater monitoring well (MW-4) was installed in Clement Avenue.

A phytoremediation project was implemented at the Site in June 2005. Based on reductions in PCE concentrations in groundwater since 2006, Alameda County Environmental Health suggested in a September 30, 2009 letter that Cargill Salt reduce the groundwater monitoring frequency from quarterly to semi-annually. The second half of 2009 was the first semi-annual monitoring period under the reduced monitoring frequency. Groundwater sampling and analysis is now performed during the first and third quarters.

1.1 Reporting Period Activities

This report presents the results of groundwater monitoring data collected during the third quarter of 2013. For three of the four monitoring wells, groundwater levels in the site monitoring wells were measured, groundwater samples were collected and analyzed, and the groundwater flow direction and gradient were determined. The well casing of one well (MW-2) has been damaged by tree roots and was unavailable for water-level measurement or sampling. Cargill Salt is looking at options for repair of the well.

The monitoring event for the second semi-annual 2013 monitoring period was conducted on September 4, 2013. Supervision of the monitoring event was conducted for Cargill Salt by Crawford.

Groundwater level measurements and collection of groundwater samples were conducted by Field Solutions, Inc. The groundwater samples were analyzed by TestAmerica Laboratories, Inc., a state-certified laboratory in Pleasanton, California.

This report was originally issued on November 13, 2013. The report was reissued on November 20, 2013 with corrections made for water-level data that had originally been mis-entered.

1.2 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.

1.2.1 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 (Figure 2). 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.

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.

1.2.2 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). 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). After the initial groundwater monitoring well sampling event in November 1999, Cargill Salt began groundwater monitoring on a quarterly basis.

A work plan for remedial investigation activities, *Workplan for Off-Site Characterization, Cargill Salt – Alameda Facility, Alameda, California* (Conor Pacific/EFW), was submitted to the ACEHS in June 2001. After approval of the workplan by the ACEHS, Cargill Salt conducted characterization activities in November and December 2001 to evaluate off-site extent of VOCs in the soil and groundwater. Soil and groundwater samples were collected and analyzed from a neighboring residential property and along Clement Avenue, slug tests were performed in the three existing monitoring wells, and a groundwater monitoring well (MW-4) was installed in Clement Avenue. The results of these activities were submitted to the ACEHS in the August 21, 2002 submittal *Off-Site Groundwater Characterization*, *Cargill Salt – Alameda Facility, Alameda, California*, prepared by Conor Pacific/EFW.

A phytoremediation project was implemented at the Site in June 2005. The project involved planting 96 bare-root hybrid poplar trees in a grid of 24 rows. The rows are generally 6 feet apart with trees on 7-foot centers on each row. Selection of the phytoremediation approach and implementation of the project were described in the October 20, 2006 report, *Groundwater Monitoring Results, First through Fourth Quarter 2005, Cargill Salt – Alameda Facility, Alameda, California* prepared by Crawford Consulting, Inc. In April 2008, seven additional saplings were planted in the rear of the property near monitoring well MW-2.

The Site groundwater monitoring wells were re-surveyed in September 2006 by CSS Environmental Services in order to provide Geotracker-compliant survey data. Results of the casing elevation survey indicate that each well is approximately 6.4 feet higher than the previous survey conducted in 1999. This difference is due to the use of different datum for the 2006 and 1999 surveys. The casing elevations from the September 2006 survey are shown on Table 1.

1.2.3 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.

2 Groundwater Flow Analysis

Groundwater levels were measured and a groundwater contour map was prepared for the second semi-annual 2013 monitoring event.

2.1 Water-Level Measurement

Water levels in three of the groundwater monitoring wells (MW-1, MW-3, and MW-4) were measured on September 4, 2013, before any of the groundwater monitoring wells were purged for sampling for the semi-annual monitoring event. As noted above, the well casing for MW-2 has been damaged by tree roots and was unavailable for water-level measurement. 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 third quarter of 2013 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. A plot of historical groundwater elevations is shown in Figure 3.

As reviewed in the last semi-annual monitoring report, groundwater levels in the on-site monitoring wells (MW-1, MW-2, and MW-3) and off-site well (MW-4) showed a different pattern in the first and third quarters of 2011 than the general seasonal pattern for the previous nine years (see Figure 3). Groundwater levels in all four wells generally exhibit similar seasonal fluctuations, and the first quarter groundwater elevations have typically exhibited effects of winter-season recharge. However, the groundwater elevations recorded in March 2011 for the three most downgradient wells showed a decline rather than the typical seasonal rise. The levels measured for those three wells in March 2011 were the lowest recorded to date. That trend continued in 2011, with the September 2011 groundwater elevations recorded for all four wells being the lowest recorded to date for each of the wells.

There was a rebound in the levels as indicated by the March 2012 groundwater elevations, however, the overall downward trend noted for 2011 continued in 2012 as groundwater levels fell after 2011/2012 winter-season recharge. The September 2012 groundwater elevations recorded for all four wells were the lowest recorded to date for each of the wells.

Seasonal recharge was reflected in all four wells for the first quarter 2013 (March 2013) groundwater elevations, with increases of 0.8 to 2.6 feet compared to the September 2012 elevations. However, the groundwater elevations for the three most downgradient wells remained approximately 2 feet lower than average first quarter elevations measured prior to 2011.

The water levels recorded for the second quarter 2013 (September 2013) measurement event indicate a continuing overall downward trend. The levels measured for wells MW-1, MW-3 and MW-4 were the lowest recorded to date for the wells.

The reason for the change in the groundwater elevations noted since March 2011 is unknown. It is suspected that artificial dewatering operations or new drainage structures downgradient of the site are resulting in lower than typical groundwater elevations.

2.2 Groundwater Flow Direction and Gradient

A groundwater contour map based on the available September 2013 water-level data is shown on Figure 4.

The groundwater flow pattern determined for the third quarter of 2013 for the site area was similar to that determined for the third quarter of 2012, with higher groundwater elevations determined for the off-site well (MW-4) than for the on-site wells, and a converging radial pattern of flow to the northwest. This pattern of flow was different than that determined for the first quarter of 2013 (flow to the northeast, with higher groundwater elevations determined for the on-site wells than the off-site well).

The horizontal hydraulic gradient measured for the third quarter of 2013 from well MW-3 towards MW-1 (to the northwest) was 0.007.

2.3 Groundwater Velocity

Average linear groundwater flow velocities (V) were calculated using a form of Darcy's Law,

$$V = Ki/n,$$

where “K” is the hydraulic conductivity, “i” is the horizontal hydraulic gradient, and “n” is the effective porosity. The groundwater velocity calculations for the third quarter of 2013 groundwater data are presented in Appendix B.

Using hydraulic conductivity and porosity values determined for saturated native materials at the Site [based on slug tests and laboratory soil testing, respectively (Conor Pacific/EFW, 2002)], and the horizontal hydraulic gradients determined from the third quarter 2013 groundwater contour map, the groundwater flow velocity beneath the Site is calculated to be approximately 0.5 feet per year (ft/yr) for the third quarter 2013 measurements. The groundwater velocities measured for the Site have historically been in the range of 0.1 to 2 ft/yr.

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 September 4, 2013 from groundwater monitoring wells MW-1, MW-3, and MW-4. As noted in Section 1, the well casing of one well (MW-2) has been damaged by tree roots and was unavailable for water-level measurement or sampling.

Dedicated tubing was installed in wells MW-1, MW-2, and MW-3 prior to the first quarter 2000 sampling event and on December 17, 2001 in well MW-4 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 pump head. 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® pump head 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 the second semi-annual 2013 event were delivered with appropriate chain-of-custody documentation to TestAmerica Laboratories, Inc., a state-certified laboratory in Pleasanton, 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 C.

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

Dup collected at MW-4 because MW-2 was not accessible.

A field duplicate was used during the second semi-annual 2013 sampling event for the Site. A field duplicate is used to assess sampling and analytical precision. The duplicate is collected at a selected well (MW-2) 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:

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

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 second semi-annual 2013 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 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:

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

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

Third Quarter 2013 Field QC Results

One field duplicate (DUP-1) was analyzed as part of the third quarter 2013 sampling event at the Site. The duplicate sample was collected at groundwater monitoring well MW-4 and was analyzed for halogenated VOCs using USEPA Method 8260B (8010 list). Table 2 summarizes the calculated RPDs for MW-4 and MW-4 duplicate (DUP-1). The three parameters (cis-1,2-DCE, TCE, PCE) for which the RPDs could be calculated (see Table 2), exhibited low RPD values (i.e., less than 5%) indicative of good precision.

Second Semi-Annual 2013 Laboratory QC Results

A review of the second semi-annual 2013 field data sheets and laboratory reports (presented in Appendices A and C, 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) RPD values for the matrix spikes and duplicate matrix spikes indicate a high overall degree of analytical precision.

No matrix spike or duplicate matrix spike recoveries were outside of the laboratory's control limits.

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 for the second semi-annual 2013 monitoring event are shown on Table 3a and Figure 5. The results of historical VOC analyses for each quarter for 2000 through third quarter 2013 are summarized in Table 3b, which also shows the VOC results for the initial sampling event for monitoring wells MW-1, MW-2, and MW-3 in November 1999. Historical VOC results for all the wells are plotted on Figure 6.

Consistent with previous monitoring events, PCE and its breakdown product TCE were detected in Site groundwater samples from the third quarter 2013 monitoring event.

For the second semi-annual 2013 event, the concentrations of PCE detected were:

- 190 micrograms per liter (μg/L) in monitoring well MW-1
- not analyzed in MW-2
- not detected in MW-3 and MW-4

Other VOCs detected included the following:

- TCE was detected at 19 μg/L in monitoring well MW-1, but was not detected in MW-3 or MW-4.
- 1,1-Dichloroethene (DCE) was detected at 43 μg/L in monitoring well MW-3, but was not detected in monitoring wells MW-1 or MW-4.
- 1,1-Dichloroethane (DCA) was detected at 1.5 μg/L in monitoring well MW-3, but was not detected in monitoring wells MW-1, or MW-4.
- 1,1,1-Thrichloroethane (TCA) was detected at 1.1 μg/L in monitoring well MW-3, but was not detected in monitoring wells MW-1 or MW-4.

3.3 Discussion

Variations in VOC concentrations at monitoring well MW-2, the well with historically the highest reported PCE concentrations at the site, generally correlate with variations in groundwater elevations at the Site. An increase in VOC concentrations generally follows a rise in groundwater elevations, and a decrease in VOC concentration generally follows a fall in groundwater levels (see Figure 7). The variations in VOC concentrations sometimes lag one quarter behind the variations in groundwater elevation.

VOC data is not available for the September 2013 sampling event. However, as described in previous monitoring reports, the average seasonal concentration of PCE reported for groundwater monitoring well MW-2 has been lower since the second quarter of 2006 (June 2006 event) compared to results reported since monitoring began in 1999 (see Figure 6). The PCE concentrations reported for MW-2 since June 2006 are an indication that the phytoremediation project implemented in June 2005 has reduced the average seasonal concentration of PCE at the site.

The results for VOC concentrations reported for the second semi-annual 2013 quarterly monitoring event are generally similar to the results reported since the second quarter of 2006 (see Figure 6), with the following exceptions:

- As of the March 2013 sampling event, the concentrations of PCE reported for well MW-2 for the eight consecutive events were the eight lowest consecutive values ever reported for MW-2.
- The concentrations of DCE reported for well MW-3 for the last six semi-annual events have been notably higher than the concentrations previously reported. The concentration of DCE reported for September 2013 was 43 μg/L.

The higher DCE concentrations noted for well MW-3 may be related to the downward trend in groundwater elevations noted for the site. As discussed in Section 2.1, the reason for the downward groundwater elevation trend measured since March 2011 is unknown and it is suspected that artificial dewatering operations or new drainage structures downgradient of the site are resulting in lower than typical groundwater elevations.

4 Phytoremediation Project Status

A phytoremediation project was implemented at the Site in June 2005. The project involved planting 96 bare-root hybrid poplar trees in a grid on the unpaved portion of the site. Selection of the phytoremediation approach and implementation of the project were described in the report, *Groundwater Monitoring Results, First through Fourth Quarter 2005, Cargill Salt – Alameda Facility, Alameda, California* (Crawford Consulting, Inc., October 20, 2006).

The trees were 4-ft-tall, bare-root poles with no foliage when planted in June 2005. During the first two years of growth, the trees developed foliage and most grew 3 to 10 additional feet in height. Photos comparing the appearance of the trees just after planting in 2005 with photos taken in June 2007, September 2009, November 2010, and May 2011 are show below and on the following pages. After three years, most of the trees had grown to heights of 10 to 25 feet. After five years, most of the trees have grown to heights of 25 to 35 feet. In April 2008, seven additional saplings were planted in the rear of the property near monitoring well MW-2. There are currently 101 hydrid poplars at the site (two trees were removed to alleviate overcrowding).

As discussed in Section 3.3, the PCE concentrations reported for monitoring well MW-2 since June 2006 are an indication that the phytoremediation project has been effective at reducing the average seasonal VOC concentration in groundwater at the site.

Bare-root trees planted in June 2005 - View towards rear of property

June 2007 - View from driveway towards rear of property

September 2009 - View from street towards driveway and rear of property

November 2010 – View from street towards driveway and rear of property
(compare tree height to photo on previous page)

May 2011 – Same view as above

May 9, 2013 – Same view as previous picture.

June 2007 - View of front planting strip at Clement Avenue

September 2009 - View of front planting strip at Clement Avenue.
(Note relative height of gate vs. trees in the pictures above and on next page)

November 2010 – Trees dropping foliage. Also, branches on
bottom 6 feet of trunks have been cleared for site visibility.

May 11, 2011 – Same view as above

May 9, 2013 – Same view as previous picture.

May 9, 2013 – View from back of property towards the street.

Professional Certification

Groundwater Monitoring Results
Second Semi-Annual 2013 Monitoring Period
Cargill Salt – Alameda Facility
Alameda, California

This report has been prepared by CRAWFORD CONSULTING, INC. with the professional certification of the California professional geologist whose signature appears below.

Dana C. Johnston
Project Manager

Mark C. Wheeler
Principal Geologist
P.G. 4563

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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 (feet)
MW-1	11/16/1999	09:56	13.16	3.75	9.41	NA
MW-1	3/30/2000	10:09	13.16	2.81	10.35	0.94
MW-1	5/16/2000	09:43	13.16	3.32	9.84	-0.51
MW-1	7/28/2000	09:11	13.16	3.58	9.58	-0.26
MW-1	11/30/2000	08:36	13.16	3.52	9.64	0.06
MW-1	3/26/2001	08:47	13.16	3.15	10.01	0.37
MW-1	6/25/2001	10:19	13.16	3.53	9.63	-0.38
MW-1	9/28/2001	09:32	13.16	3.96	9.20	-0.43
MW-1	12/17/2001	10:47	13.16	3.23	9.93	0.73
MW-1	3/21/2002	07:28	13.16	2.89	10.27	0.34
MW-1	6/6/2002	08:03	13.16	3.50	9.66	-0.61
MW-1	9/20/2002	08:30	13.16	3.86	9.30	-0.36
MW-1	12/19/2002	08:38	13.16	3.13	10.03	0.73
MW-1	3/4/2003	10:31	13.16	3.08	10.08	0.05
MW-1	6/9/2003	08:32	13.16	3.29	9.87	-0.21
MW-1	9/8/2003	10:02	13.16	3.79	9.37	-0.50
MW-1	12/1/2003	10:16	13.16	3.78	9.38	0.01
MW-1	3/4/2004	09:31	13.16	2.88	10.28	0.90
MW-1	6/2/2004	08:42	13.16	3.45	9.71	-0.57
MW-1	9/14/2004	08:01	13.16	3.87	9.29	-0.42
MW-1	12/8/2004	07:44	13.16	3.23	9.93	0.64
MW-1	3/3/2005	08:07	13.16	2.01	11.15	1.22
MW-1	6/10/2005	07:05	13.16	2.90	10.26	-0.89
MW-1	9/16/2005	08:00	13.16	3.62	9.54	-0.72
MW-1	12/6/2005	08:00	13.16	3.28	9.88	0.34
MW-1	3/10/2006	07:40	13.16	2.28	10.88	1.00
MW-1	6/9/2006	09:45	13.16	3.09	10.07	-0.81
MW-1	9/11/2006	10:24	13.16	3.70	9.46	-0.61
MW-1	12/15/2006	07:34	13.16	2.94	10.22	0.76
MW-1	3/6/2007	09:18	13.16	2.87	10.29	0.07
MW-1	6/15/2007	07:29	13.16	3.30	9.86	-0.43
MW-1	9/11/2007	08:05	13.16	3.85	9.31	-0.55
MW-1	12/4/2007	08:53	13.16	3.58	9.58	0.27
MW-1	3/20/2008	08:13	13.16	3.00	10.16	0.58
MW-1	6/18/2008	08:22	13.16	3.73	9.43	-0.73
MW-1	9/3/2008	08:06	13.16	3.93	9.23	-0.20
MW-1	12/4/2008	08:12	13.16	3.71	9.45	0.22
MW-1	3/5/2009	09:18	13.16	1.83	11.33	1.88
MW-1	6/11/2009	08:40	13.16	3.52	9.64	-1.69
MW-1	9/3/2009	07:57	13.16	3.98	9.18	-0.46
MW-1	3/2/2010	08:10	13.16	2.37	10.79	1.61
MW-1	9/3/2010	07:01	13.16	3.80	9.36	-1.43
MW-1	3/17/2011	08:04	13.16	4.44	8.72	-0.64
MW-1	9/23/2011	07:25	13.16	6.43	6.73	-1.99
MW-1	3/22/2012	07:47	13.16	4.47	8.69	1.96
MW-1	9/17/2012	08:14	13.16	6.66	6.50	-2.19
MW-1	3/6/2013	07:21	13.16	4.98	8.18	1.68
MW-1	9/4/2013	07:46	13.16	6.89	6.27	-1.91
MW-2	11/16/1999	11:15	16.22	5.22	11.00	NA
MW-2	3/30/2000	10:05	16.22	2.80	13.42	2.42

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 (feet)
MW-2	5/16/2000	09:35	16.22	4.13	12.09	-1.33
MW-2	7/28/2000	09:17	16.22	4.85	11.37	-0.72
MW-2	11/30/2000	08:32	16.22	4.75	11.47	0.10
MW-2	3/26/2001	08:40	16.22	3.28	12.94	1.47
MW-2	6/25/2001	12:12	16.22	4.75	11.47	-1.47
MW-2	9/28/2001	12:20	16.22	5.41	10.81	-0.66
MW-2	12/17/2001	10:44	16.22	4.07	12.15	1.34
MW-2	3/28/2002	09:37	16.22	3.40	12.82	0.67
MW-2	6/6/2002	08:11	16.22	4.70	11.52	-1.30
MW-2	9/20/2002	08:34	16.22	5.28	10.94	-0.58
MW-2	12/19/2002	08:45	16.22	3.37	12.85	1.91
MW-2	3/4/2003	10:26	16.22	3.11	13.11	0.26
MW-2	6/9/2003	08:31	16.22	4.16	12.06	-1.05
MW-2	9/8/2003	10:08	16.22	5.26	10.96	-1.10
MW-2	12/1/2003	10:20	16.22	5.05	11.17	0.21
MW-2	3/4/2004	09:34	16.22	2.86	13.36	2.19
MW-2	6/2/2004	08:53	16.22	4.47	11.75	-1.61
MW-2	9/14/2004	07:59	16.22	5.26	10.96	-0.79
MW-2	12/8/2004	08:00	16.22	4.20	12.02	1.06
MW-2	3/3/2005	08:04	16.22	1.90	14.32	2.30
MW-2	6/10/2005	07:09	16.22	3.74	12.48	-1.84
MW-2	9/16/2005	08:08	16.22	4.92	11.30	-1.18
MW-2	12/6/2005	10:58	16.22	4.39	11.83	0.53
MW-2	3/10/2006	07:47	16.22	2.13	14.09	2.26
MW-2	6/9/2006	10:03	16.22	3.75	12.47	-1.62
MW-2	9/11/2006	10:22	16.22	4.94	11.28	-1.19
MW-2	12/15/2006	07:32	16.22	4.08	12.14	0.86
MW-2	3/6/2007	09:13	16.22	3.27	12.95	0.81
MW-2	6/15/2007	07:31	16.22	4.57	11.65	-1.30
MW-2	9/11/2007	08:07	16.22	5.60	10.62	-1.03
MW-2	12/4/2007	08:47	16.22	4.99	11.23	0.61
MW-2	3/20/2008	08:17	16.22	3.48	12.74	1.51
MW-2	6/18/2008	08:27	16.22	4.93	11.29	-1.45
MW-2	9/3/2008	08:08	16.22	5.58	10.64	-0.65
MW-2	12/4/2008	08:14	16.22	5.07	11.15	0.51
MW-2	3/5/2009	11:10	16.22	2.30	13.92	2.77
MW-2	6/11/2009	08:41	16.22	4.44	11.78	-2.14
MW-2	9/3/2009	08:01	16.22	5.55	10.67	-1.11
MW-2	3/2/2010	08:12	16.22	2.88	13.34	2.67
MW-2	9/3/2010	07:04	16.22	5.18	11.04	-2.30
MW-2	3/17/2011	08:08	16.22	3.14	13.08	2.04
MW-2	9/23/2011	07:27	16.22	6.13	10.09	-2.99
MW-2	3/22/2012	07:42	16.22	4.24	11.98	1.89
MW-2	9/17/2012	08:18	16.22	6.77	9.45	-2.53
MW-2	3/6/2013	07:24	16.22	4.15	12.07	2.62
MW-2	9/4/2013	07:40	16.22	NA	NA	NA
MW-3	11/16/1999	15:43	13.34	4.34	9.00	NA
MW-3	3/30/2000	10:01	13.34	2.77	10.57	1.57
MW-3	5/16/2000	09:46	13.34	3.44	9.90	-0.67
MW-3	7/28/2000	09:05	13.34	3.72	9.62	-0.28

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 (feet)
MW-3	11/30/2000	08:34	13.34	3.73	9.61	-0.01
MW-3	3/26/2001	08:54	13.34	3.51	9.83	0.22
MW-3	6/25/2001	10:21	13.34	3.65	9.69	-0.14
MW-3	9/28/2001	09:30	13.34	3.96	9.38	-0.31
MW-3	12/17/2001	10:38	13.34	3.28	10.06	0.68
MW-3	3/21/2002	07:28	13.34	3.10	10.24	0.18
MW-3	6/6/2002	08:07	13.34	3.63	9.71	-0.53
MW-3	9/20/2002	08:25	13.34	3.82	9.52	-0.19
MW-3	12/19/2002	08:42	13.34	3.10	10.24	0.72
MW-3	3/4/2003	10:36	13.34	3.29	10.05	-0.19
MW-3	6/9/2003	08:28	13.34	3.41	9.93	-0.12
MW-3	9/8/2003	10:00	13.34	3.85	9.49	-0.44
MW-3	12/1/2003	10:30	13.34	3.90	9.44	-0.05
MW-3	3/4/2004	09:22	13.34	3.11	10.23	0.79
MW-3	6/2/2004	08:46	13.34	3.53	9.81	-0.42
MW-3	9/14/2004	08:05	13.34	4.07	9.27	-0.54
MW-3	12/8/2004	07:40	13.34	3.73	9.61	0.34
MW-3	3/3/2005	07:53	13.34	2.36	10.98	1.37
MW-3	6/10/2005	07:14	13.34	3.15	10.19	-0.79
MW-3	9/16/2005	08:04	13.34	3.90	9.44	-0.75
MW-3	12/6/2005	08:04	13.34	3.35	9.99	0.55
MW-3	3/10/2006	07:43	13.34	2.89	10.45	0.46
MW-3	6/9/2006	09:33	13.34	3.26	10.08	-0.37
MW-3	9/11/2006	10:19	13.34	3.70	9.64	-0.44
MW-3	12/15/2006	07:37	13.34	3.10	10.24	0.60
MW-3	3/6/2007	09:16	13.34	3.04	10.30	0.06
MW-3	6/15/2007	07:27	13.34	3.60	9.74	-0.56
MW-3	9/11/2007	08:03	13.34	3.87	9.47	-0.27
MW-3	12/4/2007	08:50	13.34	3.62	9.72	0.25
MW-3	3/20/2008	08:15	13.34	3.13	10.21	0.49
MW-3	6/18/2008	08:24	13.34	3.90	9.44	-0.77
MW-3	9/3/2008	08:02	13.34	3.92	9.42	-0.02
MW-3	12/4/2008	08:10	13.34	3.59	9.75	0.33
MW-3	3/5/2009	09:23	13.34	2.79	10.55	0.80
MW-3	6/11/2009	08:38	13.34	3.14	10.20	-0.35
MW-3	9/3/2009	07:55	13.34	4.31	9.03	-1.17
MW-3	3/2/2010	08:09	13.34	2.94	10.40	1.37
MW-3	9/3/2010	07:07	13.34	3.75	9.59	-0.81
MW-3	3/17/2011	07:59	13.34	4.88	8.46	-1.13
MW-3	9/23/2011	07:23	13.34	6.33	7.01	-1.45
MW-3	3/22/2012	07:45	13.34	5.05	8.29	1.28
MW-3	9/17/2012	08:10	13.34	6.54	6.80	-1.49
MW-3	3/6/2013	07:12	13.34	5.22	8.12	1.32
MW-3	9/4/2013	07:48	13.34	6.58	6.76	-1.36
MW-4	12/17/2001	10:40	12.43	2.55	9.88	NA
MW-4	3/28/2002	08:05	12.43	3.06	9.37	-0.51
MW-4	6/6/2002	07:57	12.43	2.85	9.58	0.21
MW-4	9/20/2002	08:28	12.43	3.21	9.22	-0.36
MW-4	12/19/2002	08:53	12.43	3.70	8.73	-0.49
MW-4	3/4/2003	10:34	12.43	3.14	9.29	0.56

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 (feet)
MW-4	6/9/2003	08:29	12.43	2.82	9.61	0.32
MW-4	9/8/2003	10:04	12.43	3.43	9.00	-0.61
MW-4	12/1/2003	10:14	12.43	3.12	9.31	0.31
MW-4	3/4/2004	09:27	12.43	2.81	9.62	0.31
MW-4	6/2/2004	08:44	12.43	3.34	9.09	-0.53
MW-4	9/14/2004	08:03	12.43	3.51	8.92	-0.17
MW-4	12/8/2004	07:36	12.43	3.10	9.33	0.41
MW-4	3/3/2005	07:44	12.43	2.48	9.95	0.62
MW-4	6/10/2005	07:02	12.43	2.47	9.96	0.01
MW-4	9/16/2005	08:12	12.43	3.23	9.20	-0.76
MW-4	12/6/2005	07:50	12.43	3.17	9.26	0.06
MW-4	3/10/2006	07:37	12.43	3.77	8.66	-0.60
MW-4	6/9/2006	07:30	12.43	2.49	9.94	1.28
MW-4	9/11/2006	10:17	12.43	3.19	9.24	-0.70
MW-4	12/21/2006	NR	12.43	2.90	9.53	0.29
MW-4	3/6/2007	09:20	12.43	2.54	9.89	0.36
MW-4	6/15/2007	07:33	12.43	3.03	9.40	-0.49
MW-4	9/11/2007	08:11	12.43	3.27	9.16	-0.24
MW-4	12/4/2007	08:55	12.43	3.25	9.18	0.02
MW-4	3/20/2008	08:20	12.43	2.65	9.78	0.60
MW-4	6/18/2008	08:31	12.43	3.35	9.08	-0.70
MW-4	9/3/2008	07:58	12.43	3.28	9.15	0.07
MW-4	12/4/2008	08:17	12.43	3.12	9.31	0.16
MW-4	3/5/2009	09:27	12.43	2.16	10.27	0.96
MW-4	6/11/2009	08:43	12.43	2.84	9.59	-0.68
MW-4	9/3/2009	08:04	12.43	3.49	8.94	-0.65
MW-4	3/2/2010	08:14	12.43	2.32	10.11	1.17
MW-4	9/3/2010	07:10	12.43	3.10	9.33	-0.78
MW-4	3/17/2011	07:55	12.43	4.52	7.91	-1.42
MW-4	9/23/2011	07:21	12.43	5.38	7.05	-0.86
MW-4	3/22/2012	07:50	12.43	4.58	7.85	0.80
MW-4	9/17/2012	08:21	12.43	5.45	6.98	-0.87
MW-4	3/6/2013	07:27	12.43	4.65	7.78	0.80
MW-4	9/4/2013	07:58	12.43	5.47	6.96	-0.82

Key:

NA = Not available

feet, MSL = feet, relative to Mean Sea Level

Casing elevations for all wells were resurveyed on September 6, 2006 by CSS Environmental Services for Geotracker compliance.

Table 2.
Relative Percent Difference Based on Duplicate Samples

Analysis	Well MW-4 Results	Duplicate (DUP-1) Results	RPD[1] (%)
		Third Quarter 2013	
Volatile Organic Compounds (µg/L)			
Cis-1,2-Dichloroethene	<0.5	<0.5	0
Trichloroethene	<0.5	<0.5	0
Tetrachloroethene (PCE)	<0.5	<0.5	0

[1] RPD = relative percent difference

All other 8010 list analytes not detected (by 8260).

Table 3a. Summary of Groundwater Monitoring Well Data - Third Quarter 2013

Well No. Field Date	**MW-1** 9/4/2013	**MW-2** 9/4/2013	**MW-3** 9/4/2013	**MW-4** 9/4/2013	MCL[1]
DCE[2]	<5.0	na	**43**	<0.5	6
DCA[3]	<5.0	na	**1.5**	<0.5	5
cis-1,2-DCE[4]	<5.0	na	<0.5	<0.5	6
TCA[5]	<5.0	na	**1.1**	<0.5	200
TCE[6]	**19**	na	<0.5	<0.5	5
PCE[7]	**190**	na	<0.5	<0.5	5
Other analytes[8]	nd[9]	na	nd	nd	nd

Notes:
Results measured in micrograms per liter (μg/L)
[1] MCL = California Primary Drinking Water Standard - Maximum Contaminant Level
[2] DCE = 1,1-Dichloroethene
[3] DCA = 1,1-Dichloroethane
[4] cis-1,2-DCE = cis-1,2-Dichloroethene
[5] TCA = 1,1,1-Trichloroethane
[6] TCE = Trichloroethene
[7] PCE = Tetrachloroethene
[8] All other 8010 list analytes
[9] nd = not detected above laboratory reporting limit
na = not analyzed due to tree roots blocking access to inside of well

Table 3b. Historical Summary of Groundwater Monitoring Well Data

Results measured in micrograms per liter (μg/L)

Well No.	MW-1																							
Field Date	11/16/99	3/30/00	5/16/00	7/28/00	11/30/00	3/26/01	6/25/01	9/28/01	12/17/01	3/21/02	6/6/02	9/20/02	12/19/02	3/4/03	6/9/03	9/8/03	12/1/03	3/4/04	6/2/04	9/14/04	12/8/04	3/3/05	6/10/05	9/16/05	MCL[1]
DCE[2]	<50.0	**13**	<10	**15**	**14**	<13	**14**	**15**	<13	<13	<13	<13	<13	<10	**12**	**5.2**	**8.4**	<5.0	**5.8**	**6.6**	<5.0	<5.0	<2.0	<5.0	6
CFC 113[3]	na[4]	**1.4**	<10	<10	<8.3	<50	<50	<50	<50	<13	<13	<13	<13	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<5.0	ne[5]
DCA[6]	<50.0	**0.8**	<10	<10	<4.2	<13	<13	<13	<13	<13	<13	<13	<13	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<5.0	5
Chloroform	<50.0	**0.6***	<10	<10	<8.3	<13	<13	<13	<13	<13	<13	<13	<13	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<10	ne
cis-1,2-DCE[7]	<10	<10	<10	<10	<4.2	<13	<13	<13	<13	<13	<13	<13	<13	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<5.0	6
TCA[8]	<50.0	**1.6**	<10	<10	<4.2	<13	<13	<13	<13	<13	<13	<13	<13	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<5.0	200
TCE[9]	**178**	**150**	**190**	**170**	**130**	**180**	**250**	**210**	**190**	**160**	**140**	**190**	**68**	**97**	**90**	**110**	**130**	**53**	**72**	**81**	**39**	**15**	**23**	**34**	5
PCE[10]	**906**	**1,400**	**1,900**	**1,200**	**880**	**1,000**	**1,400**	**1,000**	**1,400**	**1,100**	**980**	**1,100**	**600**	**730**	**770**	**780**	**850**	**370**	**490**	**620**	**380**	**160**	**180**	**240**	5
Other analytes[11]	nd[12]	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Well No.	MW-2																							
Field Date	11/16/99	3/30/00	5/16/00	7/28/00	11/30/00	3/26/01	6/25/01	9/28/01	12/17/01	3/28/02	6/6/02	9/20/02	12/30/02	3/4/03	6/9/03	9/8/03	12/1/03	3/4/04	6/2/04	9/14/04	12/8/04	3/3/05	6/10/05	9/16/05	MCL[1]
DCE[2]	<50.0	<0.5	<25	<25	<8.3	<25	<25	<25	<25	<25	<25	<25	<25	<20	<20	<20	<20	<20	<25	<25	<20	<50	<25	<20	6
CFC 113[3]	na	<0.5	<25	<25	<17	<100	<100	<100	<100	<25	<25	<25	<25	<20	<20	<20	<20	<20	<25	<25	<20	<50	<25	<20	ne[5]
DCA[6]	<50.0	<0.5	<25	<25	<8.3	<25	<25	<25	<25	<25	<25	<25	<25	<20	<20	<20	<20	<20	<25	<25	<20	<50	<25	<20	5
Chloroform	<50.0	<0.5	<25	<25	<17	<25	<25	<25	<25	<25	<25	<25	<25	<20	<20	<20	<20	<20	<25	<25	<20	<50	<25	<40	ne
cis-1,2-DCE[7]	<50.0	<0.5	<25	<25	<8.3	<25	<25	<25	<25	<25	<25	<25	<25	<20	<20	<20	<20	<20	<25	<25	<20	<50	<25	<20	6
TCA[8]	<50.0	**5.0**	<25	<25	<8.3	<25	<25	<25	<25	<25	<25	<25	<25	<20	<20	<20	<20	<20	<25	<25	<20	<50	<25	<20	200
TCE[9]	<50	**29**	**53**	<25	**20**	**40**	**78**	<25	<25	**49**	**52**	**32**	<25	**58**	**41**	**28**	**25**	**39**	**49**	**37**	**30**	**78**	**43**	**29**	5
PCE[10]	**840**	**3,600**	**3,200**	**3,300**	**1,700**	**2,200**	**4,400**	**1,700**	**1,700**	**3,500**	**3,800**	**2,100**	**1,800**	**3,900**	**3,800**	**2,500**	**2,500**	**3,000**	**4,100**	**3,800**	**2,800**	**7,300**	**3,600**	**2,500**	5
Other analytes[11]	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	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 [μg/L])

[2] DCE = 1,1-Dichloroethene

[3] CFC 113 = Trichlorotrifluoroethane (1,1,2-Trichloro-1,2,2-trifluoroethane)

[4] na = not analyzed

[5] ne = not established or none applicable

[6] DCA = 1,1-Dichloroethane

[7] cis-1,2-DCE = cis-1,2-Dichloroethene

[8] TCA = 1,1,1-Trichloroethane

[9] TCE = Trichloroethene

[10] PCE = Tetrachloroethene

[11] All other 8010 list analytes

[12] nd = not detected above laboratory reporting limit

* Chloroform detected in equipment blank at 1.6 μg/L for 3/30/00 event.

Table 3b. Historical Summary of Groundwater Monitoring Well Data

Well No.	MW-1																							
Field Date	12/6/05	3/10/06	6/9/06	9/11/06	12/15/06	3/6/07	6/15/07	9/11/07	12/4/07	3/20/08	6/18/08	9/3/08	12/4/08	3/5/09	6/11/09	9/3/09	3/2/10	9/3/10	3/17/11	9/23/11	3/22/12	9/17/12	3/6/13	9/4/13	MCL[1]
DCE[2]	<2.0	<0.5	<2.0	**3.3**	<2.0	<2.0	**3.0**	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<0.5	<2.5	<10	<5.0	<5.0	<5.0	**6.1**	<5.0	<5.0	<5.0	<5.0	6
CFC 113[3]	<2.0	<0.5	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<0.5	<2.5	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ne[5]
DCA[6]	<2.0	<0.5	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<0.5	<2.5	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5
Chloroform	<4.0	**1.4**	<4.0	<4.0	<4.0	<4.0	<4.0	<10	<10	<4.0	<10	<10	<10	**1.9**	<5.0	<20	<10	<10	<10	<10	<10	<10	<10	<10	ne
cis-1,2-DCE[7]	<2.0	<0.5	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	**0.62**	<2.5	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	6
TCA[8]	<2.0	<0.5	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<0.5	<2.5	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	200
TCE[9]	**16**	**3.4**	**22**	**47**	**20**	**17**	**38**	**51**	**29**	**18**	**42**	**65**	**42**	**6.5**	**40**	**68**	**27**	**57**	**36**	**89**	**40**	**37**	**60**	**19**	5
PCE[10]	**140**	**39**	**140**	**400**	**210**	**170**	**310**	**430**	**330**	**170**	**390**	**620**	**320**	**68**	**300**	**640**	**170**	**420**	**330**	**850**	**350**	**380**	**390**	**190**	5
Other analytes[11]	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd[9]	nd	nd	--

Well No.	MW-2																							
Field Date	12/6/05	3/10/06	6/9/06	9/11/06	12/15/06	3/6/07	6/15/07	9/11/07	12/4/07	3/20/08	6/18/08	9/3/08	12/4/08	3/5/09	6/11/09	9/3/09	3/2/10	9/3/10	3/17/11	9/23/11	3/22/12	9/17/12	3/6/13	9/4/13	MCL[1]
DCE[2]	<25	<25	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<25	<5.0	<5.0	<5.0	<5.0	<0.5	<0.5	<0.5	<0.5	na	6
CFC 113[3]	<25	<25	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<25	<5.0	<5.0	<5.0	<5.0	<0.5	<0.5	<0.5	<0.5	na	ne[5]
DCA[6]	<25	<25	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<25	<5.0	<5.0	<5.0	<5.0	<0.5	<0.5	<0.5	<0.5	na	5
Chloroform	<50	<50	<40	<20	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<50	<10	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	na	ne
cis-1,2-DCE[7]	<25	<25	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<25	<5.0	**8.0**	**6.2**	**13**	**1.3**	**3.8**	<0.5	**32**	na	6
TCA[8]	<25	<25	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<25	<5.0	<5.0	<5.0	<5.0	<0.5	<0.5	<0.5	<0.5	na	200
TCE[9]	**45**	**59**	<20	<20	<20	<20	**22**	**31**	<20	<20	**21**	<20	<20	<20	<25	<5.0	**9.5**	<5.0	**6.3**	**0.93**	**2.3**	<0.5	**3.3**	na	5
PCE[10]	**3,300**	**5,200**	**1,600**	**990**	**1,000**	**1,600**	**2,400**	**1,700**	**1,100**	**2,900**	**1,700**	**1,600**	**2,000**	**2,300**	**1,500**	**410**	**860**	**180**	**530**	**40**	**120**	**18**	**220**	na	5
Other analytes[11]	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	na	--

Notes:

[1] MCL = California Primary Drinking Water Standard - Maximum Contaminant Level

[2] DCE = 1,1-Dichloroethene

[3] CFC 113 = Trichlorotrifluoroethane (1,1,2-Trichloro-1,2,2-trifluoroethane)

[4] na = not analyzed

[5] ne = not established or none applicable

[6] DCA = 1,1-Dichloroethane

[7] cis-1,2-DCE = cis-1,2-Dichloroethene

[8] TCA = 1,1,1-Trichloroethane

[9] TCE = Trichloroethene

[10] PCE = Tetrachloroethene

[11] All other 8010 list analytes

[12] nd = not detected above laboratory reporting limit

Table 3b. Historical Summary of Groundwater Monitoring Well Data

Results measured in micrograms per liter (μg/L)

Well No.	MW-3																										
Field Date	11/16/99	3/30/00	5/16/00	7/28/00	11/30/00	3/26/01	6/25/01	9/28/01	12/17/01	3/21/02	6/6/02	9/20/02	12/19/02	3/4/03	6/9/03	9/8/03	12/1/03	3/4/04	6/2/04	9/14/04	12/8/04	3/3/05	6/10/05	9/16/05	12/6/05	3/10/06	6/9/06	MCL[1]
DCE[2]	<0.500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.51**	<0.5	**0.81**	<0.5	<0.5	**0.68**	**2.4**	**1.5**	**1.1**	**0.86**	**4.3**	6
CFC 113[3]	na	<0.5	<0.5	<0.5	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ne[5]
DCA[6]	<0.500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.50**	5
Chloroform	<0.500	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	ne
cis-1,2-DCE[7]	<0.500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
TCA[8]	<0.500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**1.0**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	200
TCE[9]	<0.500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
PCE[10]	<0.500	<0.5	<0.5	**0.8**	<0.5	<0.5	<0.5	<0.5	**0.81**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.90**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
Other analytes[11]	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Well No.	MW-4																										
Field Date	12/17/01	3/28/02	6/6/02	9/20/02	12/19/02	3/4/03	6/9/03	9/8/03	12/1/03	3/4/04	6/2/04	9/14/04	12/8/04	3/3/05	6/10/05	9/16/05	12/6/05	3/10/06	6/9/06	9/11/06	12/21/06	3/6/07	6/15/07	9/11/07	12/4/07	3/20/08	6/18/08	MCL[1]
DCE[2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
CFC 113[3]	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ne[5]
DCA[6]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
Chloroform	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ne
cis-1,2-DCE[7]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
TCA[8]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	200
TCE[9]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
PCE[10]	**2.6**	**2.8**	**2.0**	**2.5**	**1.1**	**2.1**	**2.1**	**1.6**	**1.6**	**1.7**	**1.4**	**1.3**	**1.2**	**0.93**	**0.98**	**0.8**	**1.1**	**0.79**	**0.64**	**0.70**	**0.63**	**0.70**	**0.75**	**0.86**	**0.92**	**0.91**	**0.86**	5
Other analytes[11]	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	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 [μg/L])

[2] DCE = 1,1-Dichloroethene

[3] CFC 113 = Trichlorotrifluoroethane (1,1,2-Trichloro-1,2,2-trifluoroethane)

[4] na = not analyzed

[5] ne = not established or none applicable

[6] DCA = 1,1-Dichloroethane

[7] cis-1,2-DCE = cis-1,2-Dichloroethene

[8] TCA = 1,1,1-Trichloroethane

[9] TCE = Trichloroethene

[10] PCE = Tetrachloroethene

[11] All other 8010 list analytes

[12] nd = not detected above laboratory reporting limit

Table 3b. Historical Summary of Groundwater Monitoring Well Data

Well No.	MW-3																					
Field Date	9/11/06	12/15/06	3/6/07	6/15/07	9/11/07	12/4/07	3/20/08	6/18/08	9/3/08	12/4/08	3/5/09	6/11/09	9/3/09	3/2/10	9/3/10	3/17/11	9/23/11	3/22/12	9/17/12	3/6/13	9/4/13	MCL[1]
DCE[2]	**2.8**	**1.6**	**1.5**	**2.4**	**1.4**	**1.1**	**1.0**	**1.4**	**0.79**	**0.59**	<0.5	**0.95**	**0.51**	<0.5	**0.64**	**13**	**34**	**45**	**53**	**50**	**43**	6
CFC 113[3]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ne[5]
DCA[6]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.90**	**1.4**	**1.4**	**1.7**	**2.2**	**1.5**	5
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ne
cis-1,2-DCE[7]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
TCA[8]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**1.3**	**1.5**	**1.5**	**1.2**	**1.1**	200
TCE[9]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
PCE[10]	<0.5	**0.56**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.79**	<0.5	<0.5	<0.5	<0.5	5
Other analytes[11]	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Well No.	MW-4												
Field Date	9/3/08	12/4/08	3/5/09	6/11/09	9/3/09	3/2/10	9/3/10	3/17/11	9/23/11	3/22/12	9/17/12	3/6/13	9/4/13	MCL[1]
DCE[2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
CFC 113[3]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ne[5]
DCA[6]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ne
cis-1,2-DCE[7]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
TCA[8]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	200
TCE[9]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
PCE[10]	**0.84**	**0.65**	**0.62**	**0.70**	**0.79**	**0.78**	**0.64**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
Other analytes[11]	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Notes:

[1] MCL = California Primary Drinking Water Standard - Maximum Contaminant Level

[2] DCE = 1,1-Dichloroethene

[3] CFC 113 = Trichlorotrifluoroethane (1,1,2-Trichloro-1,2,2-trifluoroethane)

[4] na = not analyzed

[5] ne = not established or none applicable

[6] DCA = 1,1-Dichloroethane

[7] cis-1,2-DCE = cis-1,2-Dichloroethene

[8] TCA = 1,1,1-Trichloroethane

[9] TCE = Trichloroethene

[10] PCE = Tetrachloroethene

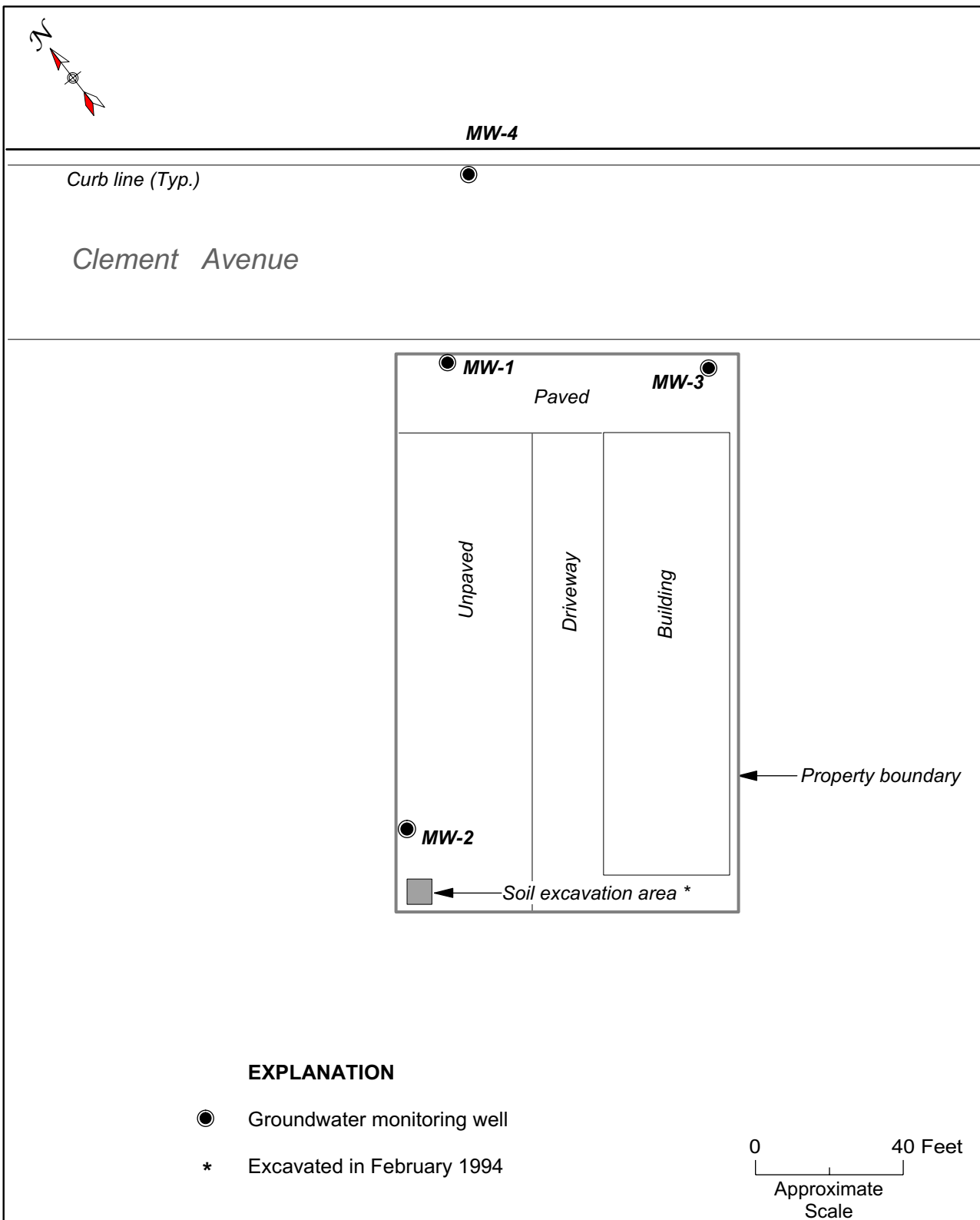
[11] All other 8010 list analytes

[12] nd = not detected above laboratory reporting limit

CRAWFORD CONSULTING INC.

Project No. CS1605
Cargill Salt Dispensing Systems Division
2016 Clement Avenue, Alameda, California
Figure 1. Site Location

1605fig104.dsf 12/8/04



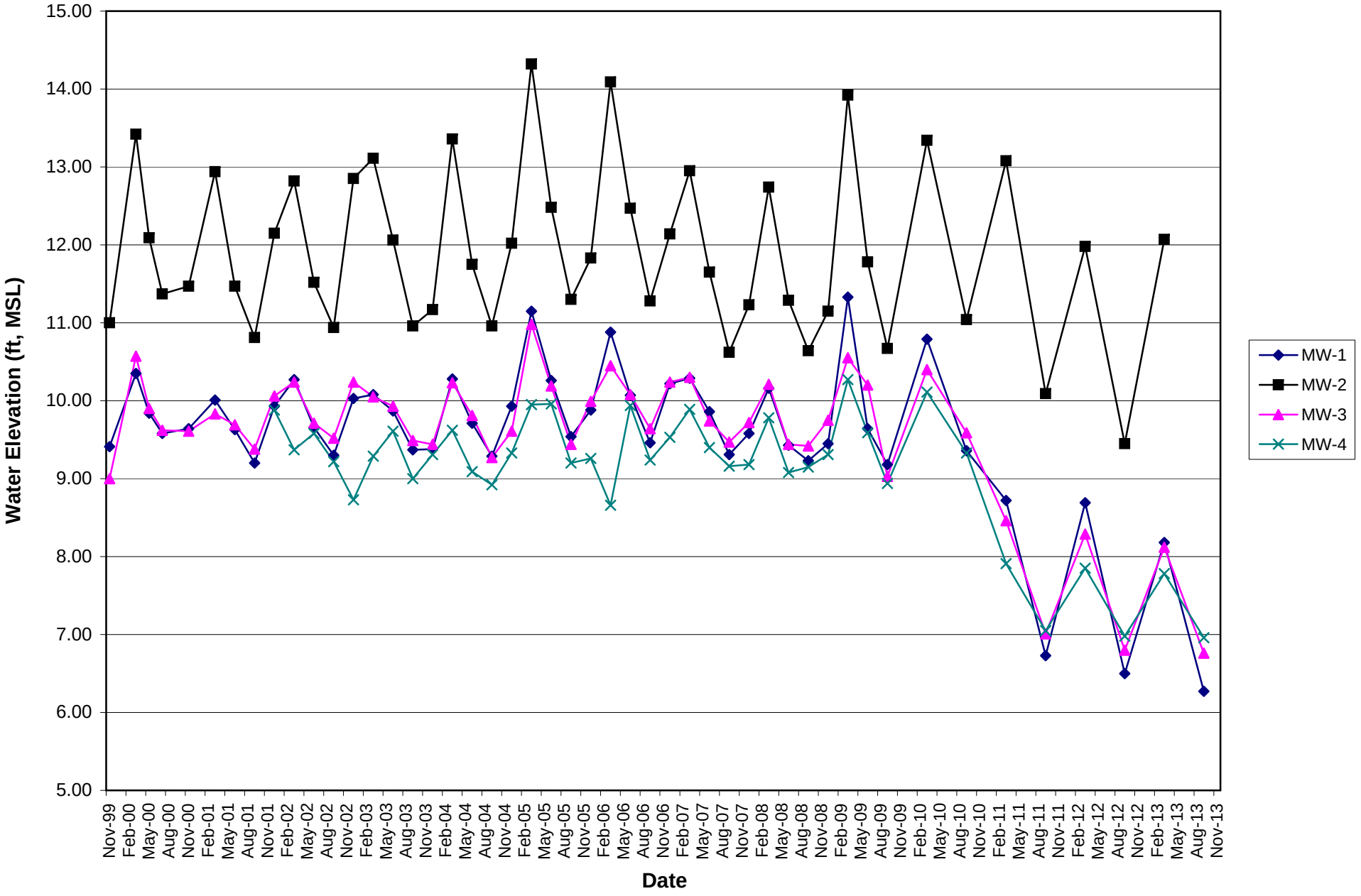
1605fig212Q3.dsf 11/5/12

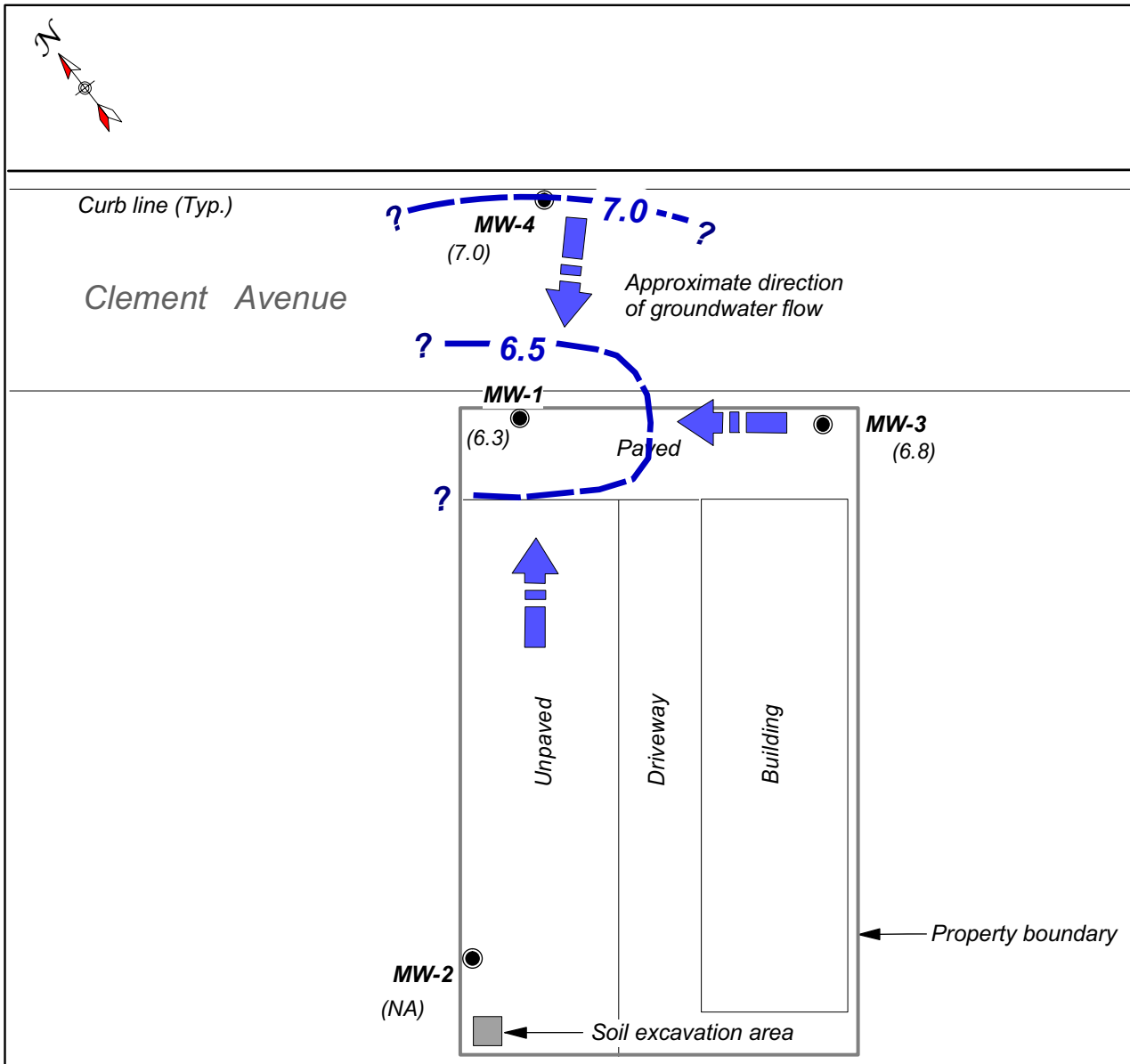
Base map from Conor Pacific/EFW, Off-Site Groundwater Characterization, August 21, 2002.

CRAWFORD CONSULTING INC.

Project No. CS1605
Cargill Salt Dispensing Systems Division
2016 Clement Avenue, Alameda, California
Figure 2. Groundwater Monitoring Well Locations

Figure 3. Graphical Summary of Groundwater Elevations





EXPLANATION

◉ Monitoring well

(6.8) Groundwater elevation (Ft.-MSL); measured 9/4/13

6.5 Groundwater elevation contour (Ft.-MSL)

(NA) Not measured due to tree roots blocking access to inside of well

0 40 Feet

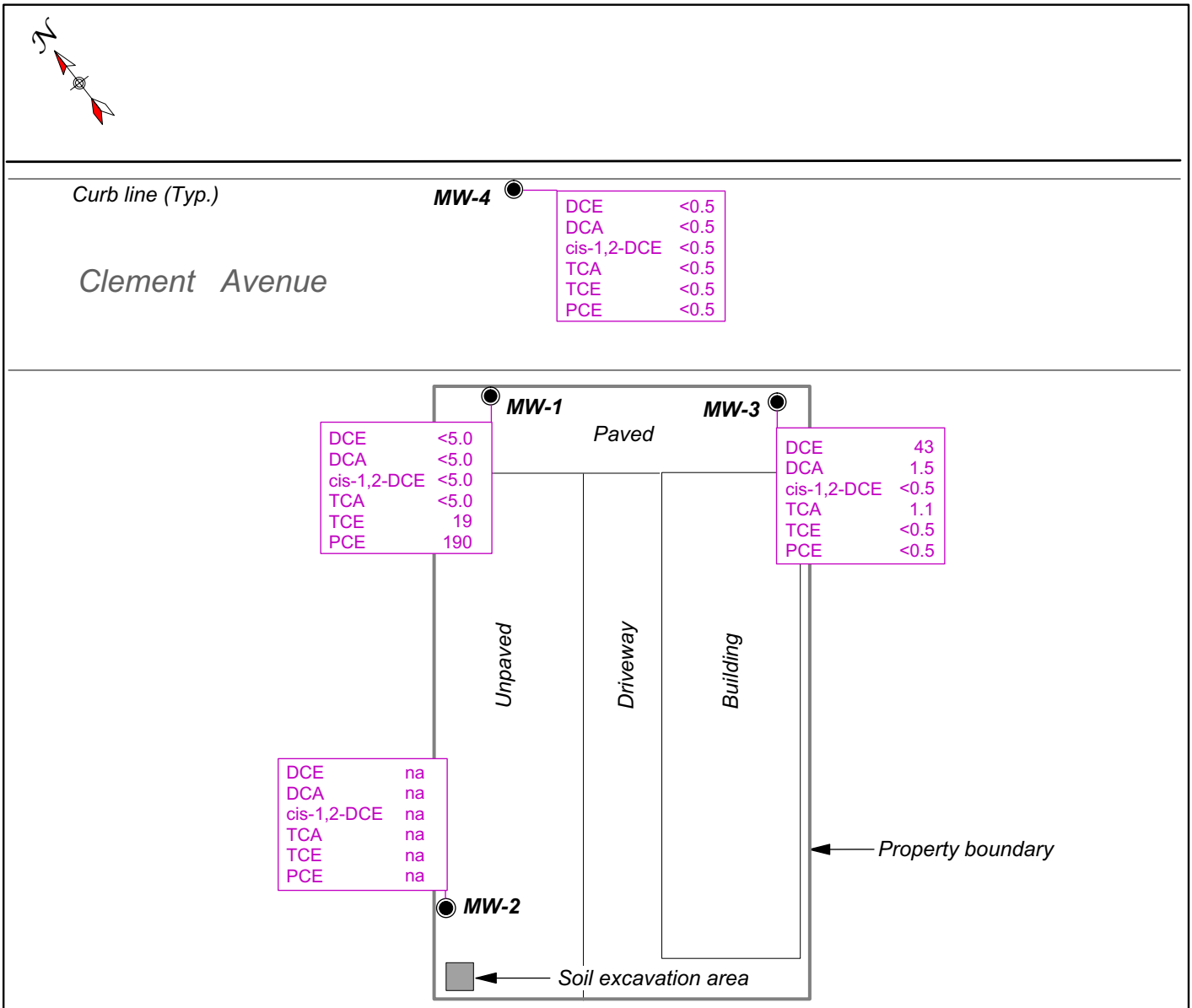
Approximate Scale

1605fig413Q3.dsf 11/20/13

Base map from Conor Pacific/EFW, Off-Site Groundwater Characterization, August 21, 2002.

CRAWFORD CONSULTING INC.

Project No. CS1605
Cargill Salt Dispensing Systems Division
2016 Clement Avenue, Alameda, California
Figure 4. Groundwater Elevation Contours - September 2013



EXPLANATION

◉ Groundwater monitoring well location

DCE 43
DCA 1.5
cis-1,2-DCE <0.5
TCA 1.1
TCE <0.5
PCE <0.5

Analyte concentration

Analytical parameter

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

DCE = 1,1-Dichloroethene
DCA = 1,1-Dichloroethane
PCE = Tetrachloroethene
TCA = 1,1,1-Trichloroethane
TCE = Trichloroethene
VOCs = Volatile organic compounds
cis-1,2-DCE = cis-1,2-Dichloroethene
na = not analyzed due to tree roots blocking access to inside of well

0 40 Feet
Approximate Scale

1605fig513Q3.dsf 11/5/13

Base map from Conor Pacific/EFW, Off-Site Groundwater Characterization, August 21, 2002.

CRAWFORD CONSULTING INC.

Project No. CS1605
Cargill Salt Dispensing Systems Division
2016 Clement Avenue, Alameda, California
Figure 5. VOC Concentrations in Groundwater – September 2013

Figure 6. Graphical Summary of PCE Concentrations

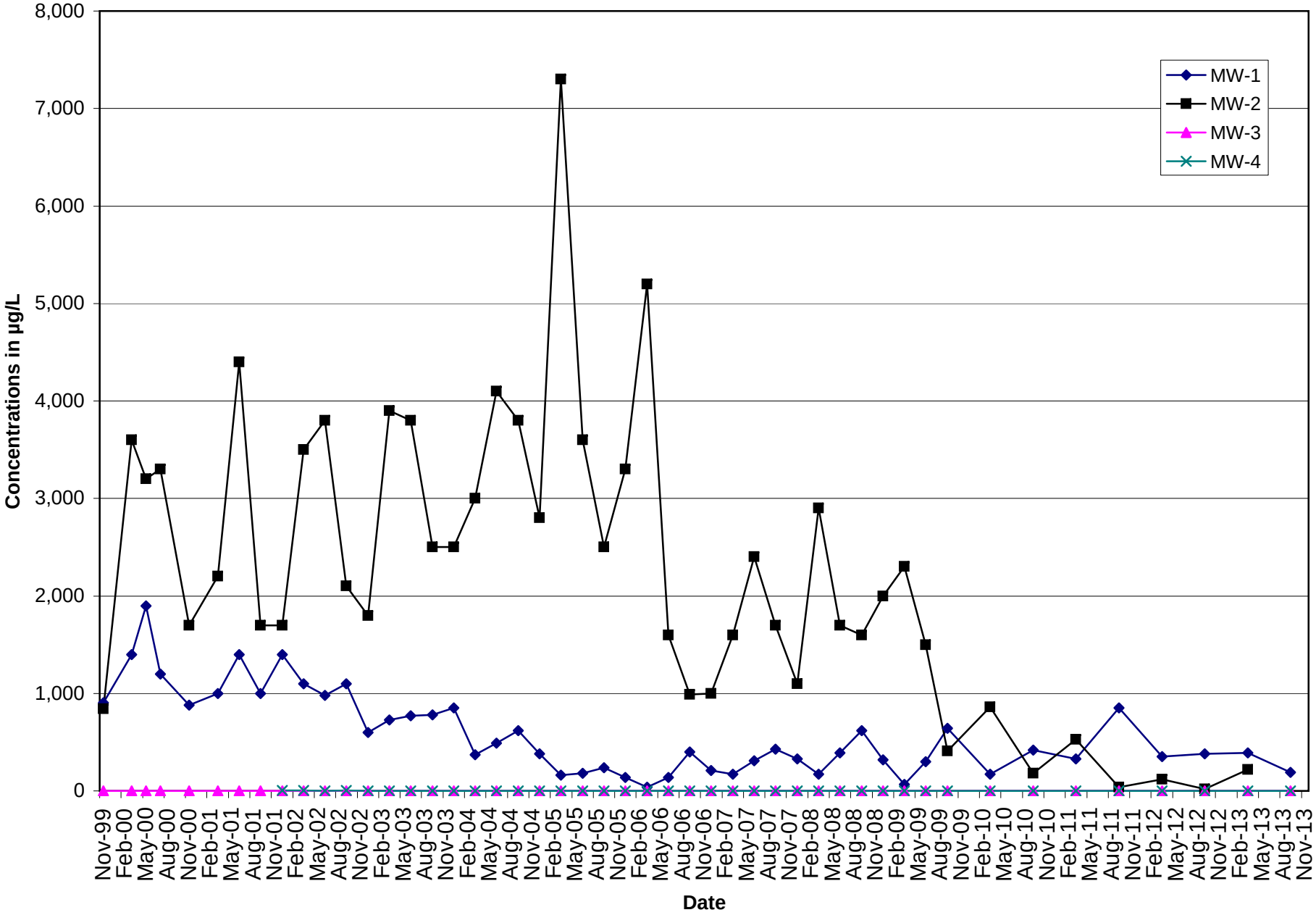
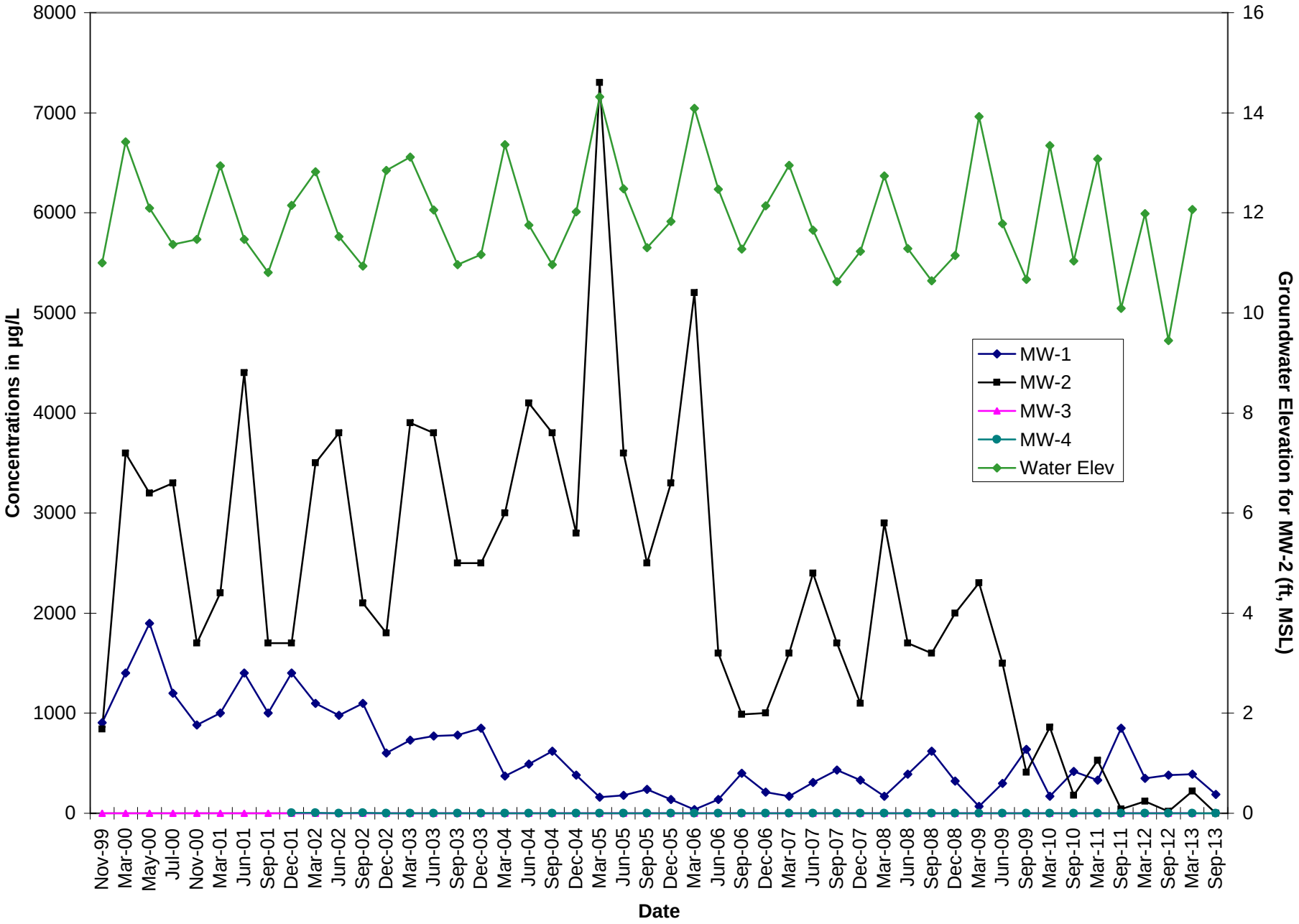


Figure 7. PCE Concentrations vs. Groundwater Elevation



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	9/4/13	0746	6.89	6.89	
MW-2	9/4/13	0740	NR	NR	6.8 obs. Roots
MW-3	9/4/13	0748	6.58	6.58	
MW-4	9/4/13	0750	5.47	5.47	

Data Collection

Field measurements by:
Print: R. Gwens
Signature: RG
Date: 9/4/13

Reviewed by:
Print: J Boteim
Signature: J Boteim
Date: 9/10/13

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: 9/4/13
Finish Date: 9/4/13

WELL INFORMATION

Casing diameter (in.): 10 Depth to water (ft): 6.87 Well depth (ft): 18.3
One casing volume (gal.): 0.46 Calculated purge volume (gal.) *(3 x casing volume)*: 1.40
One casing volume = π 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): ND Method for checking: Interface probe Clear bailer

WELL PURGING

Date purged: 9/4/13 Start time: 1027 End time: 1057
Purging equipment: Submersible pump Bladder pump Peristaltic pump
PVC bailer Teflon bailer Other
Purge rate (L/min): 0.18 Well yield (H/L): High
Purge water disposal: Drum onsite

Time (2400 hr)	Cumulative Vol. Purged (Liters)	pH (units)	EC (µS/cm)	T (° C)	Color (Visual)	Turbidity (NTU)
1038	1.7	7.24	485	19.4	clear	21.1
1048	3.4	7.16	486	18.9	clear	41.1
1057	5.3	7.17	483	19.0	tan	26.3

Total Purged (Liters): 5.3

WELL SAMPLING

Date sampled: 9/4/13 Start time: 1050 End time: 1103
Depth to water (ft) before sampling: 13.07
Sampling equipment: Peristaltic pump X Bladder pump Teflon bailer
PVC bailer Other

Weather conditions: Clear Ambient temperature (° F): 70
Well condition/Remarks: OK, Bolts Need to be Replaced
All Samples collected

Meter calibration: EC SEE MW-4 pH
Temperature Turbidity

Purged and sampled by (print): R Guevara
Signature: RG Reviewed by:

SAMPLE COLLECTION FIELD DATA

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

Well ID: MW-2
Sample ID:
Start Date: 9/4/13
Finish Date:

WELL INFORMATION

Casing diameter (in.): 2.0 Depth to water (ft): Well depth (ft):
One casing volume (gal.): Calculated purge volume (gal.) *(3 x casing volume)*:
One casing volume = π 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 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 (L/min): NA Well yield (H/L):
Purge water disposal:

Time (2400 hr)	Cumulative Vol. Purged (Liters)	pH (units)	EC (µS/cm)	T (° C)	Color (Visual)	Turbidity (NTU)
- NA						

Total Purged (Liters):

WELL SAMPLING

Date sampled: Start time: End time:
Depth to water (ft) before sampling:
Sampling equipment: Peristaltic pump Bladder pump Teflon bailer
PVC bailer Other

Weather conditions: Ambient temperature (° F):
Well condition/Remarks: Hit obstruction @ 6'.8 seems to be Roots, unable to purge & Sample on take DTW

Meter calibration: EC SEE MW-4 pH
Temperature Turbidity

Purged and sampled by (print): RGuevara
Signature: RG Reviewed by:

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: 9/4/13
Finish Date: 9/4/13

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 6.58 Well depth (ft): 17.6
One casing volume (gal.): 0.45 Calculated purge volume (gal.) *(3 x casing volume)*: 1.35
One casing volume = π 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): ND Method for checking: Interface probe X Clear bailer

WELL PURGING

Date purged: 9/4/13 Start time: 0927 End time: 1010
Purging equipment: Submersible pump Bladder pump Peristaltic pump
PVC bailer Teflon bailer Other
Purge rate (L/min): 0.11 Well yield (H/L): low
Purge water disposal: Drum on site

Time (2400 hr)	Cumulative Vol. Purged (Liters)	pH (units)	EC (µS/cm)	T (° C)	Color (Visual)	Turbidity (NTU)
0936	1.7	7.53	574	19.5	clear	8.9
0949	3.4	7.47	573	19.3	clear	5.2
1010	5.1	7.44	572	19.5	clear	6.3

Total Purged (Liters): 5.1

WELL SAMPLING

Date sampled: 9/4/13 Start time: 1011 End time: 1018
Depth to water (ft) before sampling: 16.90
Sampling equipment: Peristaltic pump X Bladder pump Teflon bailer
PVC bailer Other

Weather conditions: clear, partly cloudy Ambient temperature (° F): 70
Well condition/Remarks: OK, needs bolts

All Samples collected

Meter calibration: EC SEE MW-4 pH
Temperature Turbidity

Purged and sampled by (print): R. Guevara
Signature:

Reviewed by:

SAMPLE COLLECTION FIELD DATA

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

Well ID: MW-4
Sample ID: MW-4
Start Date: 9/4/13
Finish Date: 9/4/13

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 5.47 Well depth (ft): 19.0
One casing volume (gal.): 0.55 Calculated purge volume (gal.) *(3 x casing volume)*: 1.66
One casing volume = π 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): ND Method for checking: Interface probe X Clear bailer

WELL PURGING

Date purged: 9/4/13 Start time: 0805 End time: 0906
Purging equipment: Submersible pump Bladder pump Peristaltic pump X
PVC bailer Teflon bailer Other
Purge rate (L/min): 0.1 Well yield (H/L): High
Purge water disposal: Drum on site

Time (2400 hr)	Cumulative Vol. Purged (Liters)	pH (units)	EC (µS/cm)	T (° C)	Color (Visual)	Turbidity (NTU)
0824	2.1	7.03	604	21.0	clear	4.0
0847	4.2	7.45	603	20.7	clear	4.8
0906	6.3	7.51	598	20.5	clear	3.6

Total Purged (Liters): 6.3

WELL SAMPLING

Date sampled 9/4/13 Start time: 0907 End time: 0913
Depth to water (ft) before sampling: 11.08
Sampling equipment: Peristaltic pump X Bladder pump Teflon bailer
PVC bailer Other

Weather conditions: Partly cloudy Ambient temperature (° F): 60
Well condition/Remarks:
Dup-1 collected
All samples collected

Meter calibration: EC 15,070, 15,000 pH 6.98, 7.00, 10.01, 1000, 4.04, 4.01
Temperature 19.0 Turbidity SW-002

Purged and sampled by (print): R. Guevara
Signature: RG Reviewed by: JM

Appendix B

Groundwater Velocity Calculations

APPENDIX B

GROUNDWATER VELOCITY CALCULATIONS

FOR CARGILL ALAMEDA SITE

GROUNDWATER VELOCITY FORMULA

$V = Ki/n$ where:

V = average linear groundwater velocity — i = hydraulic gradient
K = hydraulic conductivity — n = effective porosity

PARAMETERS

Range of hydraulic conductivity values (K) from slug tests:

Material	Well	K (cm/sec)
Silty sand (SM) and Clayey sand (SC)	MW-1	0.00002
Silty sand (SM) and Clayey sand (SC)	MW-2	0.00002
Silty sand (SM) and Clayey sand (SC)	MW-3	0.000003
	Highest measured K =	0.00002

Porosity (n) = 33% (from laboratory analysis of boring B21 soil sample)

Hydraulic gradient (i) calculated from groundwater contours:

September 2013 0.007

UNIT CONVERSIONS

1 day = 86,400 sec — 1 cm/sec = 2,834.65 ft/day
1 foot = 30.48 cm — 1 cm/sec = 1,034,645.67 ft/yr

CALCULATED VELOCITIES

Measurement Event	Flow Direction	K (cm/sec)	i (ft/ft)	n	V (ft/yr)
September 2013	NW	0.00002	0.007	0.33	0.5

Calculations and assumptions prepared by: Mark C. Wheeler

Date: 11/20/13

Appendix C

Certified Analytical Reports and Chain-of-Custody Documentation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-52088-1
Client Project/Site: Alameda Facility CS 1605

For:
Crawford Consulting Inc
4 North First Street Suite 650
San Jose, California 95113-1326

Attn: Mr. Mark Wheeler

Authorized for release by:
9/9/2013 2:43:59 PM
Afsaneh Salimpour, Project Manager I
afsaneh.salimpour@testamericainc.com

Designee for

Onieka Howard, Project Manager I
onieka.howard@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-52088-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-52088-1

Comments
No additional comments.

Receipt
The samples were received on 9/4/2013 12:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 5.6° C.

GC/MS VOA
No analytical or quality issues were noted.

Detection Summary

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-52088-1

Client Sample ID: MW-1 — Lab Sample ID: 720-52088-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	19		5.0		ug/L	10		8260B	Total/NA
Tetrachloroethene	190		5.0		ug/L	10		8260B	Total/NA

Client Sample ID: MW-3 — Lab Sample ID: 720-52088-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethene	43		0.50		ug/L	1		8260B	Total/NA
1,1-Dichloroethane	1.5		0.50		ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	1.1		0.50		ug/L	1		8260B	Total/NA

Client Sample ID: MW-4 — Lab Sample ID: 720-52088-3

No Detections.

Client Sample ID: DUP-1 — Lab Sample ID: 720-52088-4

No Detections.

Client Sample ID: TB-1 — Lab Sample ID: 720-52088-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-52088-1

Client Sample ID: MW-1
Date Collected: 09/04/13 10:58
Date Received: 09/04/13 12:30

Lab Sample ID: 720-52088-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		5.0		ug/L			09/05/13 19:55	10
1,1-Dichloroethane	ND		5.0		ug/L			09/05/13 19:55	10
Dichlorodifluoromethane	ND		5.0		ug/L			09/05/13 19:55	10
Vinyl chloride	ND		5.0		ug/L			09/05/13 19:55	10
Chloroethane	ND		10		ug/L			09/05/13 19:55	10
Trichlorofluoromethane	ND		10		ug/L			09/05/13 19:55	10
Methylene Chloride	ND		50		ug/L			09/05/13 19:55	10
trans-1,2-Dichloroethene	ND		5.0		ug/L			09/05/13 19:55	10
cis-1,2-Dichloroethene	ND		5.0		ug/L			09/05/13 19:55	10
Chloroform	ND		10		ug/L			09/05/13 19:55	10
1,1,1-Trichloroethane	ND		5.0		ug/L			09/05/13 19:55	10
Carbon tetrachloride	ND		5.0		ug/L			09/05/13 19:55	10
1,2-Dichloroethane	ND		5.0		ug/L			09/05/13 19:55	10
Trichloroethene	**19**		5.0		ug/L			09/05/13 19:55	10
1,2-Dichloropropane	ND		5.0		ug/L			09/05/13 19:55	10
Dichlorobromomethane	ND		5.0		ug/L			09/05/13 19:55	10
trans-1,3-Dichloropropene	ND		5.0		ug/L			09/05/13 19:55	10
cis-1,3-Dichloropropene	ND		5.0		ug/L			09/05/13 19:55	10
1,1,2-Trichloroethane	ND		5.0		ug/L			09/05/13 19:55	10
Tetrachloroethene	**190**		5.0		ug/L			09/05/13 19:55	10
Chlorodibromomethane	ND		5.0		ug/L			09/05/13 19:55	10
Chlorobenzene	ND		5.0		ug/L			09/05/13 19:55	10
Bromoform	ND		10		ug/L			09/05/13 19:55	10
1,1,2,2-Tetrachloroethane	ND		5.0		ug/L			09/05/13 19:55	10
1,3-Dichlorobenzene	ND		5.0		ug/L			09/05/13 19:55	10
1,4-Dichlorobenzene	ND		5.0		ug/L			09/05/13 19:55	10
1,2-Dichlorobenzene	ND		5.0		ug/L			09/05/13 19:55	10
Chloromethane	ND		10		ug/L			09/05/13 19:55	10
Bromomethane	ND		10		ug/L			09/05/13 19:55	10
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.0		ug/L			09/05/13 19:55	10
EDB	ND		5.0		ug/L			09/05/13 19:55	10
1,2,4-Trichlorobenzene	ND		10		ug/L			09/05/13 19:55	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*97*		*70 - 130*		*09/05/13 19:55*	*10*
4-Bromofluorobenzene	*89*		*67 - 130*		*09/05/13 19:55*	*10*
1,2-Dichloroethane-d4 (Surr)	*96*		*72 - 130*		*09/05/13 19:55*	*10*

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-52088-1

Client Sample ID: MW-3
Date Collected: 09/04/13 10:11
Date Received: 09/04/13 12:30

Lab Sample ID: 720-52088-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	**43**		0.50		ug/L			09/05/13 20:21	1
1,1-Dichloroethane	**1.5**		0.50		ug/L			09/05/13 20:21	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/05/13 20:21	1
Vinyl chloride	ND		0.50		ug/L			09/05/13 20:21	1
Chloroethane	ND		1.0		ug/L			09/05/13 20:21	1
Trichlorofluoromethane	ND		1.0		ug/L			09/05/13 20:21	1
Methylene Chloride	ND		5.0		ug/L			09/05/13 20:21	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/05/13 20:21	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/05/13 20:21	1
Chloroform	ND		1.0		ug/L			09/05/13 20:21	1
1,1,1-Trichloroethane	**1.1**		0.50		ug/L			09/05/13 20:21	1
Carbon tetrachloride	ND		0.50		ug/L			09/05/13 20:21	1
1,2-Dichloroethane	ND		0.50		ug/L			09/05/13 20:21	1
Trichloroethene	ND		0.50		ug/L			09/05/13 20:21	1
1,2-Dichloropropane	ND		0.50		ug/L			09/05/13 20:21	1
Dichlorobromomethane	ND		0.50		ug/L			09/05/13 20:21	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/05/13 20:21	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/05/13 20:21	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/05/13 20:21	1
Tetrachloroethene	ND		0.50		ug/L			09/05/13 20:21	1
Chlorodibromomethane	ND		0.50		ug/L			09/05/13 20:21	1
Chlorobenzene	ND		0.50		ug/L			09/05/13 20:21	1
Bromoform	ND		1.0		ug/L			09/05/13 20:21	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/05/13 20:21	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/05/13 20:21	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/05/13 20:21	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/05/13 20:21	1
Chloromethane	ND		1.0		ug/L			09/05/13 20:21	1
Bromomethane	ND		1.0		ug/L			09/05/13 20:21	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/05/13 20:21	1
EDB	ND		0.50		ug/L			09/05/13 20:21	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/05/13 20:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*70 - 130*		*09/05/13 20:21*	*1*
4-Bromofluorobenzene	*87*		*67 - 130*		*09/05/13 20:21*	*1*
1,2-Dichloroethane-d4 (Surr)	*97*		*72 - 130*		*09/05/13 20:21*	*1*

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-52088-1

Client Sample ID: MW-4
Date Collected: 09/04/13 09:07
Date Received: 09/04/13 12:30

Lab Sample ID: 720-52088-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			09/05/13 20:46	1
1,1-Dichloroethane	ND		0.50		ug/L			09/05/13 20:46	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/05/13 20:46	1
Vinyl chloride	ND		0.50		ug/L			09/05/13 20:46	1
Chloroethane	ND		1.0		ug/L			09/05/13 20:46	1
Trichlorofluoromethane	ND		1.0		ug/L			09/05/13 20:46	1
Methylene Chloride	ND		5.0		ug/L			09/05/13 20:46	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/05/13 20:46	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/05/13 20:46	1
Chloroform	ND		1.0		ug/L			09/05/13 20:46	1
1,1,1-Trichloroethane	ND		0.50		ug/L			09/05/13 20:46	1
Carbon tetrachloride	ND		0.50		ug/L			09/05/13 20:46	1
1,2-Dichloroethane	ND		0.50		ug/L			09/05/13 20:46	1
Trichloroethene	ND		0.50		ug/L			09/05/13 20:46	1
1,2-Dichloropropane	ND		0.50		ug/L			09/05/13 20:46	1
Dichlorobromomethane	ND		0.50		ug/L			09/05/13 20:46	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/05/13 20:46	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/05/13 20:46	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/05/13 20:46	1
Tetrachloroethene	ND		0.50		ug/L			09/05/13 20:46	1
Chlorodibromomethane	ND		0.50		ug/L			09/05/13 20:46	1
Chlorobenzene	ND		0.50		ug/L			09/05/13 20:46	1
Bromoform	ND		1.0		ug/L			09/05/13 20:46	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/05/13 20:46	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/05/13 20:46	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/05/13 20:46	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/05/13 20:46	1
Chloromethane	ND		1.0		ug/L			09/05/13 20:46	1
Bromomethane	ND		1.0		ug/L			09/05/13 20:46	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/05/13 20:46	1
EDB	ND		0.50		ug/L			09/05/13 20:46	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/05/13 20:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*70 - 130*		*09/05/13 20:46*	*1*
4-Bromofluorobenzene	*90*		*67 - 130*		*09/05/13 20:46*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*72 - 130*		*09/05/13 20:46*	*1*

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-52088-1

Client Sample ID: DUP-1
Date Collected: 09/04/13 00:00
Date Received: 09/04/13 12:30

Lab Sample ID: 720-52088-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			09/05/13 21:12	1
1,1-Dichloroethane	ND		0.50		ug/L			09/05/13 21:12	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/05/13 21:12	1
Vinyl chloride	ND		0.50		ug/L			09/05/13 21:12	1
Chloroethane	ND		1.0		ug/L			09/05/13 21:12	1
Trichlorofluoromethane	ND		1.0		ug/L			09/05/13 21:12	1
Methylene Chloride	ND		5.0		ug/L			09/05/13 21:12	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/05/13 21:12	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/05/13 21:12	1
Chloroform	ND		1.0		ug/L			09/05/13 21:12	1
1,1,1-Trichloroethane	ND		0.50		ug/L			09/05/13 21:12	1
Carbon tetrachloride	ND		0.50		ug/L			09/05/13 21:12	1
1,2-Dichloroethane	ND		0.50		ug/L			09/05/13 21:12	1
Trichloroethene	ND		0.50		ug/L			09/05/13 21:12	1
1,2-Dichloropropane	ND		0.50		ug/L			09/05/13 21:12	1
Dichlorobromomethane	ND		0.50		ug/L			09/05/13 21:12	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/05/13 21:12	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/05/13 21:12	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/05/13 21:12	1
Tetrachloroethene	ND		0.50		ug/L			09/05/13 21:12	1
Chlorodibromomethane	ND		0.50		ug/L			09/05/13 21:12	1
Chlorobenzene	ND		0.50		ug/L			09/05/13 21:12	1
Bromoform	ND		1.0		ug/L			09/05/13 21:12	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/05/13 21:12	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/05/13 21:12	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/05/13 21:12	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/05/13 21:12	1
Chloromethane	ND		1.0		ug/L			09/05/13 21:12	1
Bromomethane	ND		1.0		ug/L			09/05/13 21:12	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/05/13 21:12	1
EDB	ND		0.50		ug/L			09/05/13 21:12	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/05/13 21:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*70 - 130*		*09/05/13 21:12*	*1*
4-Bromofluorobenzene	*89*		*67 - 130*		*09/05/13 21:12*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*72 - 130*		*09/05/13 21:12*	*1*

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-52088-1

Client Sample ID: TB-1
Date Collected: 09/04/13 00:00
Date Received: 09/04/13 12:30

Lab Sample ID: 720-52088-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			09/05/13 19:03	1
1,1-Dichloroethane	ND		0.50		ug/L			09/05/13 19:03	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/05/13 19:03	1
Vinyl chloride	ND		0.50		ug/L			09/05/13 19:03	1
Chloroethane	ND		1.0		ug/L			09/05/13 19:03	1
Trichlorofluoromethane	ND		1.0		ug/L			09/05/13 19:03	1
Methylene Chloride	ND		5.0		ug/L			09/05/13 19:03	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/05/13 19:03	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/05/13 19:03	1
Chloroform	ND		1.0		ug/L			09/05/13 19:03	1
1,1,1-Trichloroethane	ND		0.50		ug/L			09/05/13 19:03	1
Carbon tetrachloride	ND		0.50		ug/L			09/05/13 19:03	1
1,2-Dichloroethane	ND		0.50		ug/L			09/05/13 19:03	1
Trichloroethene	ND		0.50		ug/L			09/05/13 19:03	1
1,2-Dichloropropane	ND		0.50		ug/L			09/05/13 19:03	1
Dichlorobromomethane	ND		0.50		ug/L			09/05/13 19:03	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/05/13 19:03	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/05/13 19:03	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/05/13 19:03	1
Tetrachloroethene	ND		0.50		ug/L			09/05/13 19:03	1
Chlorodibromomethane	ND		0.50		ug/L			09/05/13 19:03	1
Chlorobenzene	ND		0.50		ug/L			09/05/13 19:03	1
Bromoform	ND		1.0		ug/L			09/05/13 19:03	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/05/13 19:03	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/05/13 19:03	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/05/13 19:03	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/05/13 19:03	1
Chloromethane	ND		1.0		ug/L			09/05/13 19:03	1
Bromomethane	ND		1.0		ug/L			09/05/13 19:03	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/05/13 19:03	1
EDB	ND		0.50		ug/L			09/05/13 19:03	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/05/13 19:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*100*		*70 - 130*		*09/05/13 19:03*	*1*
4-Bromofluorobenzene	*90*		*67 - 130*		*09/05/13 19:03*	*1*
1,2-Dichloroethane-d4 (Surr)	*97*		*72 - 130*		*09/05/13 19:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 720-143691/5
Matrix: Water
Analysis Batch: 143691

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			09/05/13 17:44	1
1,1-Dichloroethane	ND		0.50		ug/L			09/05/13 17:44	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/05/13 17:44	1
Vinyl chloride	ND		0.50		ug/L			09/05/13 17:44	1
Chloroethane	ND		1.0		ug/L			09/05/13 17:44	1
Trichlorofluoromethane	ND		1.0		ug/L			09/05/13 17:44	1
Methylene Chloride	ND		5.0		ug/L			09/05/13 17:44	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/05/13 17:44	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/05/13 17:44	1
Chloroform	ND		1.0		ug/L			09/05/13 17:44	1
1,1,1-Trichloroethane	ND		0.50		ug/L			09/05/13 17:44	1
Carbon tetrachloride	ND		0.50		ug/L			09/05/13 17:44	1
1,2-Dichloroethane	ND		0.50		ug/L			09/05/13 17:44	1
Trichloroethene	ND		0.50		ug/L			09/05/13 17:44	1
1,2-Dichloropropane	ND		0.50		ug/L			09/05/13 17:44	1
Dichlorobromomethane	ND		0.50		ug/L			09/05/13 17:44	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/05/13 17:44	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/05/13 17:44	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/05/13 17:44	1
Tetrachloroethene	ND		0.50		ug/L			09/05/13 17:44	1
Chlorodibromomethane	ND		0.50		ug/L			09/05/13 17:44	1
Chlorobenzene	ND		0.50		ug/L			09/05/13 17:44	1
Bromoform	ND		1.0		ug/L			09/05/13 17:44	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/05/13 17:44	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/05/13 17:44	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/05/13 17:44	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/05/13 17:44	1
Chloromethane	ND		1.0		ug/L			09/05/13 17:44	1
Bromomethane	ND		1.0		ug/L			09/05/13 17:44	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/05/13 17:44	1
EDB	ND		0.50		ug/L			09/05/13 17:44	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/05/13 17:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*70 - 130*		*09/05/13 17:44*	*1*
4-Bromofluorobenzene	*90*		*67 - 130*		*09/05/13 17:44*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*72 - 130*		*09/05/13 17:44*	*1*

Lab Sample ID: LCS 720-143691/6
Matrix: Water
Analysis Batch: 143691

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	19.4		ug/L		78	64 - 128
1,1-Dichloroethane	25.0	20.6		ug/L		83	70 - 130
Dichlorodifluoromethane	25.0	26.0		ug/L		104	34 - 132
Vinyl chloride	25.0	22.0		ug/L		88	54 - 135
Chloroethane	25.0	22.4		ug/L		90	62 - 138

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-143691/6
Matrix: Water
Analysis Batch: 143691

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Trichlorofluoromethane			25.0	25.7		ug/L		103	66 - 132		
Methylene Chloride			25.0	19.8		ug/L		79	70 - 147		
trans-1,2-Dichloroethene			25.0	23.5		ug/L		94	68 - 130		
cis-1,2-Dichloroethene			25.0	21.8		ug/L		87	70 - 130		
Chloroform			25.0	22.4		ug/L		89	70 - 130		
1,1,1-Trichloroethane			25.0	24.5		ug/L		98	70 - 130		
Carbon tetrachloride			25.0	27.5		ug/L		110	70 - 146		
1,2-Dichloroethane			25.0	23.1		ug/L		92	61 - 132		
Trichloroethene			25.0	25.7		ug/L		103	70 - 130		
1,2-Dichloropropane			25.0	21.5		ug/L		86	70 - 130		
Dichlorobromomethane			25.0	24.4		ug/L		98	70 - 130		
trans-1,3-Dichloropropene			25.0	22.4		ug/L		90	70 - 140		
cis-1,3-Dichloropropene			25.0	22.6		ug/L		91	70 - 130		
1,1,2-Trichloroethane			25.0	23.7		ug/L		95	70 - 130		
Tetrachloroethene			25.0	24.4		ug/L		98	70 - 130		
Chlorodibromomethane			25.0	30.6		ug/L		123	70 - 145		
Chlorobenzene			25.0	23.4		ug/L		93	70 - 130		
Bromoform			25.0	30.9		ug/L		124	68 - 136		
1,1,2,2-Tetrachloroethane			25.0	20.0		ug/L		80	70 - 130		
1,3-Dichlorobenzene			25.0	25.1		ug/L		101	70 - 130		
1,4-Dichlorobenzene			25.0	24.9		ug/L		100	70 - 130		
1,2-Dichlorobenzene			25.0	23.5		ug/L		94	70 - 130		
Chloromethane			25.0	21.6		ug/L		86	52 - 175		
Bromomethane			25.0	26.8		ug/L		107	43 - 151		
1,1,2-Trichloro-1,2,2-trifluoroethane			25.0	24.4		ug/L		98	42 - 162		
EDB			25.0	26.0		ug/L		104	70 - 130		
1,2,4-Trichlorobenzene			25.0	24.6		ug/L		98	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*70 - 130*
4-Bromofluorobenzene	*90*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*93*		*72 - 130*

Lab Sample ID: LCSD 720-143691/7
Matrix: Water
Analysis Batch: 143691

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene			25.0	19.6		ug/L		79	64 - 128	1	20
1,1-Dichloroethane			25.0	20.8		ug/L		83	70 - 130	1	20
Dichlorodifluoromethane			25.0	26.7		ug/L		107	34 - 132	3	20
Vinyl chloride			25.0	22.2		ug/L		89	54 - 135	1	20
Chloroethane			25.0	23.7		ug/L		95	62 - 138	6	20
Trichlorofluoromethane			25.0	25.8		ug/L		103	66 - 132	0	20
Methylene Chloride			25.0	20.2		ug/L		81	70 - 147	2	20
trans-1,2-Dichloroethene			25.0	23.8		ug/L		95	68 - 130	1	20
cis-1,2-Dichloroethene			25.0	22.1		ug/L		88	70 - 130	1	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 720-143691/7
Matrix: Water
Analysis Batch: 143691

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloroform			25.0	22.4		ug/L		90	70 - 130	0	20
1,1,1-Trichloroethane			25.0	24.7		ug/L		99	70 - 130	1	20
Carbon tetrachloride			25.0	27.7		ug/L		111	70 - 146	1	20
1,2-Dichloroethane			25.0	23.4		ug/L		93	61 - 132	1	20
Trichloroethene			25.0	26.1		ug/L		104	70 - 130	1	20
1,2-Dichloropropane			25.0	21.7		ug/L		87	70 - 130	1	20
Dichlorobromomethane			25.0	25.0		ug/L		100	70 - 130	2	20
trans-1,3-Dichloropropene			25.0	22.7		ug/L		91	70 - 140	1	20
cis-1,3-Dichloropropene			25.0	22.5		ug/L		90	70 - 130	0	20
1,1,2-Trichloroethane			25.0	24.1		ug/L		96	70 - 130	2	20
Tetrachloroethene			25.0	24.8		ug/L		99	70 - 130	2	20
Chlorodibromomethane			25.0	31.4		ug/L		126	70 - 145	3	20
Chlorobenzene			25.0	23.6		ug/L		94	70 - 130	1	20
Bromoform			25.0	31.4		ug/L		126	68 - 136	2	20
1,1,2,2-Tetrachloroethane			25.0	20.5		ug/L		82	70 - 130	2	20
1,3-Dichlorobenzene			25.0	25.6		ug/L		102	70 - 130	2	20
1,4-Dichlorobenzene			25.0	25.4		ug/L		101	70 - 130	2	20
1,2-Dichlorobenzene			25.0	23.8		ug/L		95	70 - 130	1	20
Chloromethane			25.0	22.9		ug/L		92	52 - 175	6	20
Bromomethane			25.0	27.8		ug/L		111	43 - 151	4	20
1,1,2-Trichloro-1,2,2-trifluoroethane			25.0	25.3		ug/L		101	42 - 162	4	20
EDB			25.0	26.6		ug/L		106	70 - 130	2	20
1,2,4-Trichlorobenzene			25.0	25.4		ug/L		102	70 - 130	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*99*		*70 - 130*
4-Bromofluorobenzene	*91*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*90*		*72 - 130*

QC Association Summary

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-52088-1

GC/MS VOA

Analysis Batch: 143691

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-52088-1	MW-1	Total/NA	Water	8260B	
720-52088-2	MW-3	Total/NA	Water	8260B	
720-52088-3	MW-4	Total/NA	Water	8260B	
720-52088-4	DUP-1	Total/NA	Water	8260B	
720-52088-5	TB-1	Total/NA	Water	8260B	
LCS 720-143691/6	Lab Control Sample	Total/NA	Water	8260B	
LCSD 720-143691/7	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 720-143691/5	Method Blank	Total/NA	Water	8260B	

Lab Chronicle

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-52088-1

Client Sample ID: MW-1

Lab Sample ID: 720-52088-1

Date Collected: 09/04/13 10:58
Matrix: Water
Date Received: 09/04/13 12:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		10	143691	09/05/13 19:55	PDR	TAL PLS

Client Sample ID: MW-3

Lab Sample ID: 720-52088-2

Date Collected: 09/04/13 10:11
Matrix: Water
Date Received: 09/04/13 12:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	143691	09/05/13 20:21	PDR	TAL PLS

Client Sample ID: MW-4

Lab Sample ID: 720-52088-3

Date Collected: 09/04/13 09:07
Matrix: Water
Date Received: 09/04/13 12:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	143691	09/05/13 20:46	PDR	TAL PLS

Client Sample ID: DUP-1

Lab Sample ID: 720-52088-4

Date Collected: 09/04/13 00:00
Matrix: Water
Date Received: 09/04/13 12:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	143691	09/05/13 21:12	PDR	TAL PLS

Client Sample ID: TB-1

Lab Sample ID: 720-52088-5

Date Collected: 09/04/13 00:00
Matrix: Water
Date Received: 09/04/13 12:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	143691	09/05/13 19:03	PDR	TAL PLS

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-52088-1

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-14

Method Summary

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-52088-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL PLS

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-52088-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-52088-1	MW-1	Water	09/04/13 10:58	09/04/13 12:30
720-52088-2	MW-3	Water	09/04/13 10:11	09/04/13 12:30
720-52088-3	MW-4	Water	09/04/13 09:07	09/04/13 12:30
720-52088-4	DUP-1	Water	09/04/13 00:00	09/04/13 12:30
720-52088-5	TB-1	Water	09/04/13 00:00	09/04/13 12:30

148381

Test America
1220 Quarry Lane, Pleasanton. CA 94566
(925) 484-1919 FAX (925) 484-1096

720-52088

CHAIN OF CUSTODY / LABORATORY ANALYSIS REQUEST FORM

Service Request: _____ Date: 9/4/13

Project Name: Alameda Facility
Project Number: CS1605
Project Manager: Dana Johnston
Company/Address: Crawford Consulting, Inc.
4 North Second St. Suite 650
San Jose, CA 95113
Phone: (408) 287-9934

Sampler's Signature: [signature]

Sample I.D.	Date	Time	LAB I.D.	Sample Matrix	Number of Containers	Volatile Organics (VOCs) (EPA 8021B)	Pb (7421); As (7060) Same as Metals	COD, TKN 500 ml plastic H_2SO_4	Chloride, Nitrate 500 ml plastic NP	pH, Conductivity 500 ml plastic NP	Total Phenols 2 x 500 ml glass H_2SO_4	**Volatile Organics (8010) 2 x 40 ml vial**	TPHgBTEX 2 x 40 ml vial HCl			REMARKS
MW-1	9/4/13	1058		Water	3							X				
MW-2	—	—	ND	Samples		collected						X				
MW-3	9/4/13	1011		Water	3							X				
MW-4	9/4/13	0907		Water	3							X				
DUP-1	9/4/13	—		Water	3							X				
TB-1	9/4/13	—		Water	2							X				

Relinquished By	Received By
Signature: [signature]	Signature: [signature]
Printed Name: Ruben Guevara	Printed Name: [signature]
Firm: F.S.E	Firm: [signature]
Date/Time: 9/4/13, 1230	Date/Time: 9-4-13 1230
Relinquished By	Received By
Signature	Signature
Printed Name	
Firm	
Date/Time	

TURNAROUND REQUIREMENTS
___ 24 hr ___ 48 hr ___ 5 day
x Standard (5 working days)
___ Provide Verbal Preliminary Results
x Provide pdf Results
Due Date _____

REPORT REQUIREMENTS
___ I Routine Report
x 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 _____

Special Instructions/Comments:

Please report MRLs only

Please pdf results to: Dana Johnston at dana@crawfordconsulting.com

Please provide EDF for Geotracker. Global ID is SL0600177511

5.6°C

720-52088 Chain of Custody

Login Sample Receipt Checklist

Client: Crawford Consulting Inc

Job Number: 720-52088-1

Login Number: 52088

List Source: TestAmerica Pleasanton

List Number: 1

Creator: Gonzales, Justinn

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A