Cargill

November 8, 2006

Jerry Wickham
Hazardous Materials Specialist
Alameda County Environmental Health Services
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

RE: Work Plan for Cargill Salt Alameda Facility, 2016 Clement Street, Alameda, California, SLIC Case No. RO0002480

Dear Mr. Wickham,

The attached work plan was prepared to respond to your August 24, 2006 letter request to address technical comments and submit a work plan for additional site work. The attached work plan was prepared by Crawford Consulting, Inc. for Cargill Salt.

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 attached work plan, please don't hesitate to call me at (510) 790-8625.

Sincerely,

Teri Peterson
Environmental Manager

CRAWFORD
CONSULTING
INC.

November 8, 2006
Project No. CS1605

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

Re: Work Plan for Cargill Salt Alameda Facility, 2016 Clement Street, Alameda, California, SLIC Case No. RO0002480

Dear Mr. Wickham:

At the request of Cargill Salt, Crawford Consulting, Inc. (Crawford) has prepared this work plan to respond to your August 24, 2006 letter request to address technical comments and submit a work plan for additional site work.

Teri Peterson of Cargill Salt and Mark Wheeler of Crawford Consulting, Inc. met with you on October 24, 2006 to review the site history and discuss our proposed approach to the additional site work requested. Responses to the technical comments and the proposed scope for the additional work are presented below according to the item numbers of your August 24, 2006 letter.

Responses to Technical Comments and Proposed Scope for Additional Work

1. Source of VOCs

"The observation that soils down to a depth of 4 feet bgs were not impacted does not appear to be consistent with a surface spill....please comment on the likely source of VOCs and use of the upper 4 feet of soils as backfill in the excavation."

Likely source of VOCs

Based on field observations and analytical data obtained during the 1993 and 1994 site investigations, the source of perchloroethylene (PCE) in groundwater at the site was very likely a localized surface spill or discharge of a relatively small quantity of PCE to soil near the rear property line of the site. Results of these investigations were presented in "Soil and Groundwater Investigations and Remedial Activities, July 1993 - September 1994, Cargill Salt - Alameda Facility, prepared by Groundworks Environmental, Inc., July 31, 1995."

Laboratory analysis of soil samples and field screening of vapors in boreholes and in bagged soil samples from soil borings indicated that (1) PCE contamination in the presumed source area was present in vadose-zone soil at depths of approximately 4.5 to 5.5 feet, just above the groundwater table at the time of the field investigations, as well as in saturated soils below the groundwater table, and (2) that the location of the surface spill was at or immediately adjacent to soil boring ASB-1, where the highest concentration of PCE [740 parts per million (ppm)] was detected in soil from any boring at the site. Boring ASB-1 had been specifically targeted for a small area where surficial soils appeared disturbed and light-colored sands (possibly casting sands from foundry operations at the site) were present.

In borings advanced at distances of 1 to 10 feet from ASB-1, the highest field measurements of organic vapors were recorded for soil samples that were moist and were within 1 to 1.5 feet of the water table. Organic vapor readings for drier soils at shallower depths were significantly lower or were at background levels.

An upgradient soil or groundwater source for the PCE detected at ASB-1 was not considered to be a likely explanation for the concentration of PCE detected in soil and groundwater at boring ASB-1 based on soil and groundwater results obtained from borings ASB-11 and AGB-2 advanced at the property line several feet upgradient of ASB-1.

Based on apparent surficial discharge of metals-impacted sands from site operations in small localized areas in the vacant side of the facility lot, it was concluded that the likely source of PCE was a small-quantity discharge to soils at a small area where there was ground disturbance and where metals-impacted sands were present (at the boring ASB-1 location). The possibility that a discharge of PCE from the laundry room adjacent to the rear property line and just a few feet away from ASB-1 was also considered to be a possible source of a surface discharge of PCE.

It is likely that at the time of the field investigations and source area excavation in 1993 and 1994, there was very little or no PCE remaining in dry vadose zone soils in the surface spill area. It is believed that the PCE spill had occurred some years earlier, and that PCE in the vadose zone at the location of the apparent surface spill volatilized over time, leaving little or no contamination within most of the vadose zone but remaining in the capillary fringe and in groundwater and soils in the saturated zone.

Use of the upper 4 feet of soils as backfill

Having assessed the lateral extent of PCE in vadose-zone soils near ASB-1, the intent of the backhoe excavation project in 1994 was to remove vadose-zone soils with the highest degree of chemical impact and thereby reduce the potential for further impact to groundwater quality. As soil excavation proceeded, soils from the excavation were visually inspected for signs of staining and headspace analyses were performed on samples of the excavated soil. The headspace analyses were performed by placing a soil sample in a sealable plastic bag and using a Sensidyne® detector with PCE detector tubes to monitor for PCE vapors. On the basis of these field observations and measurements, soil to a depth of approximately 4 feet was determined to be non-impacted and was stockpiled for use in backfilling the excavation. Soils from depths of 4 to 6 feet were determined to be impacted and were excavated and placed into bins for disposal.

As the field screening methods may not have detected very low concentrations of PCE remaining in vadose zone soils to a depth of 4 feet, it is possible that some of the vadose-zone soils used as vadose-zone backfill in the excavation area contained some low-level concentrations of PCE. If so, such concentrations would have been relatively low, would have been unlikely to pose a significant ongoing threat to groundwater, and would most likely have continued to volatilize in the vadose zone environment since that time. In addition, hybrid poplars planted in the source area as part of the phytoremediation project implemented at the site in 2005 should help to further reduce remaining vadose zone concentrations of PCE. The phytoremediation project is discussed in item 3 below.

2. Potential Indoor Air Vapor Intrusion

"In order to further evaluate the potential for indoor air intrusion, we request that you conduct soil vapor sampling. Please present plans for soil vapor sampling in the Work Plan..."

As discussed with you in our October 24, 2006 meeting, we propose to collect and analyze soil vapor samples at 10 on-site locations. The proposed locations are shown on Figure 1. Soil vapor will be collected at 5 locations underneath the asphalt driveway adjacent to the facility building and at 5 locations along the northwestern perimeter of the site. The proposed locations were selected to provide soil vapor samples adjacent to or near on-site and off-site buildings.

The soil vapor samples will be collected and analyzed by TEG of Rancho Cordova, California, using temporary probes and an on-site mobile laboratory. The sampling and analysis methodologies will generally follow DTSC protocols as prescribed in "Interim Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, Department of Toxic Substances Control, California Environmental Protection Agency, December 15, 2004, (Revised February 7, 2005)." TEG's soil vapor survey methodology is summarized in Attachment A.

DTSC generally recommends collection of soil gas samples at depths of 5 feet and greater. As the depth to groundwater at the site is usually 5 feet or less (the depth to groundwater has fluctuated from approximately 2 to 5 feet over the last few years), it will not be possible to follow this guideline. However, we will follow the DTSC guidance for sites where the depth to groundwater is less than 5 feet and will collect 5 soil vapor samples beneath a paved surface (the asphalt driveway adjacent to the facility building) to evaluate the potential for vapor accumulation:

> Soil gas samples should not be collected at depths shallower than 5 feet in order to minimize barometric pumping effects. Deeper samples should be collected as needed to define vertical trends in vapor concentrations. For sites that overlie contaminated groundwater, an effort should be made to collect soil gas samples from immediately above the capillary fringe zone and half-way to the surface. For sites where the depth to groundwater is less than five feet, an attempt should be made to collect soil gas samples from beneath existing building foundations or similar settings, such as garage floors, patios, parking lots, roads, and other areas that are covered with pavement, concrete or a similar material, as a mechanism to evaluate the potential for vapor accumulation. (DTSC, 2005, p. 6.)

The depth for collection of the soil vapor samples will be determined on the day of the field work. The depth to groundwater will be checked in the on-site groundwater monitoring wells. To avoid sampling within the capillary fringe, the depth for the soil vapor collection will be one foot shallower than the depth of groundwater.

The soil vapor samples will be collected from probes driven with a hand-operated electric rotary hammer. The soil vapor samples will be analyzed for VOCs using U.S. Environmental Protection Agency (USEPA) Method 8260B.

The potential for significant lateral migration of soil vapor in the vadose zone at the site appears limited as the vadose zone is very thin. However, the results of the on-site sample locations will be assessed to determine if conducting off-site soil vapor sampling appears warranted and recommendations will be presented in a report of results.

3. Remediation of PCE Source

"Based on (site) data, impacted soil is present below the base of the excavation. In addition, elevated headspace readings were obtained in a boring north of the excavation...please review these results and discuss the feasibility of additional soil removal or other remediation in the source area."

As stated in the 1995 Groundworks report, the intent of this excavation was to remove vadose-zone soils with the highest degree of chemical impact and thereby reduce the potential for impact to groundwater quality. After the excavation of approximately 4 cubic yards of source area soils at the boring ASB-1 location, where concentrations as high as 740 milligrams per Kilogram (mg/Kg) had been detected before excavation, the vertical extent of chemical impact to saturated soils remaining beneath and near the excavation at ASB-1 was delineated in a September 1994 soil coring program. Analysis of soil samples collected in soil-core borings beneath and adjacent to the excavation showed that PCE remained in saturated soil at depths between 5 and 10 feet. Soil samples from depths of approximately 6.5 feet and 9 feet in slant boring AC-1 showed concentrations of 3.4 and 31 mg/Kg, respectively, beneath the excavation area. Lower concentrations (0.83 mg/Kg) were detected less than 5 feet northeast of the excavation in boring AC-2 at a depth of 9 feet. Also, VOCs were detected at 639 parts per million in a headspace measurement of soils collected from a depth of 5 feet in boring AC-2. No VOCs were detected in soil samples collected at depths between 11 and 25 feet in borings AC-1 and AC-2 beneath and adjacent to the excavation area. A 1-foot-thick clay lens logged at a depth of 11 feet may help to retard the downward migration of VOCs.

As discussed with you in our October 24, 2006 meeting, the phytoremediation project initiated at the site in June 2005 should help to further reduce remaining vadose zone, as well as saturated zone, concentrations of PCE in the source area and in the main plume area.

A description of the phytoremediation project is presented in the report "Groundwater Monitoring Results, First through Fourth Quarter 2005, Cargill Salt - Alameda Facility," prepared by Crawford Consulting, Inc., October 20, 2006. As stated in that report, effectiveness of the phytoremediation project will be evaluated as part of the ongoing groundwater monitoring program. Status reports will be included in the groundwater monitoring reports. It is expected that it will take two to three years for the trees and root systems to become established and for the trees to start having a significant effect on VOC concentrations in groundwater at the Site. Tree growth and VOC concentrations will be monitored and evaluated to determine the effectiveness of the phytoremediation project.

4. Groundwater Monitoring

"We request that you conduct groundwater sampling of the four monitoring wells on a semi-annual basis. Please include plans to conduct groundwater monitoring in the Work Plan..."

To continue monitoring seasonal fluctuations in groundwater elevations and VOC concentrations and to evaluate the effectiveness of the phyoremediation project, Cargill Salt will continue to conduct groundwater monitoring on a quarterly basis. Groundwater monitoring reports will submitted on a semi-annual basis. Based on the results of the phytoremediation project over the next several years, Cargill Salt may propose to reduce the monitoring frequency.

For each quarterly groundwater monitoring event, groundwater levels in the four site monitoring wells will be measured, groundwater samples will be collected and analyzed, and the groundwater flow direction and gradient will be determined. Groundwater samples will be collected from monitoring wells MW-1, MW-2, MW-3, and MW-4. Dedicated tubing [fluorinated ethylene propylene resin (FEP)-lined polyethylene tubing] has been installed in the wells to facilitate sampling with a peristaltic pump. The tubing intake is located 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 will be purged using a peristaltic pump. Field parameters (pH, electrical conductivity, temperature, and turbidity) will be measured in purged groundwater from each well prior to sampling; these data will be recorded on the Sample Collection Field Data sheets. After purging of a minimum of 3 casing volumes, groundwater samples will be collected using the peristaltic pump and the dedicated Viton® pump head discharge tubing. The groundwater samples will be analyzed for VOCs using USEPA Method 8021B and results for all Method 8010 analytes will be reported. In addition, a field duplicate sample will be collected at one well each quarter and submitted for analysis of VOCs using the same USEPA method.

5. Metals in Surface Soils

"Five near surface soil samples were collected at the site on July 13, 1993 and analyzed for metals. Metals concentrations in three of the soil samples exceeded regulatory criteria. Impacted soils at these three locations were described in the report entitled, 'Soil and Groundwater Investigations and Remedial Activities, July 1993 - September 1994,' dated July 31, 1995 as 'casting sands,' that were light and reddish-colored soils differing in appearance from the remaining surface soils at the site. Small excavations were performed at the three sampling locations where elevated concentrations of metals were detected. Following excavation of the surface soil, one confirmation soil sample was collected at each of the three small excavations. In the Work Plan...please evaluate the adequacy of the surface soil sampling conducted to date to characterize metals concentrations in surface soils at the site given the high frequency of detection during the initial sampling event."

The initial soil sampling event conducted on July 13, 1993 focused on the rear portion of the unpaved side of the site where surficial disturbance of soils had been observed during a site walk conducted to assess potential environmental impacts. A total of 10 shallow borings (ASB-1 through ASB-10) were hand-augered and 22 soil samples were collected. At three of these locations (ASB-1, ASB-2 and ASB-9), light-colored or reddish colored sands were observed to be mixed into the native soils. These light-colored and reddish-colored sands contrasted with the predominately brown color of the native soil at the site. These light-colored and reddish-colored sands were not observed below depths of 0.5 to 1.0 foot in the soil borings. Soil samples of the soils containing these sands at borings ASB-1, ASB-2 and ASB-9 were submitted for metals analysis. Soil samples from two other borings, ASB-6 and ASB-8, where no discolored soils were observed, were also submitted for metals analysis. Results of the metals analysis showed a clear association of metals impacts with soils that contained the light-colored or reddish colored sands. Based on the history of the site practices, it was concluded that these sands represented casting sands.

Plans for remediation of the metals-impacted surficial soils as proposed in the October 19, 1993 letter report, "Results of soil sampling and workplan for remedial activities, Alameda facility" prepared by Groundworks Environmental, Inc., were accepted by the Alameda County Dept. of Environmental Health (ACDEH). Soil excavation and verification soil sampling was then conducted according to these plans. The extent of soil excavation at the three boring locations were metals-impacts had been detected was determined in the field based on the visual appearance of the soils. Soils containing light-colored or reddish colored sands were excavated and containerized for off-site disposal and confirmation soil samples were collected at the base of each excavation. The results of the confirmation soil samples showed that soils with elevated concentrations of metals were successfully removed.

At the time of the soil sampling programs conducted in 1993 and 1994, the unpaved portion of the site was only lightly vegetated and areas of soil disturbance or soil discoloration were readily apparent. No other locations were observed where light-colored or reddish-colored sands were mixed into site soils. Based on the association of the metals impacts with the light-colored and reddish-colored casting sands from site operations and the results of the soil sampling and remediation activities conducted in 1993 and 1994, the surface soil sampling program conducted to characterize metals was effective in identifying soils impacted by site operations and is judged to be adequate.

6. Geotracker EDF Submittals

For compliance with the electronic data submittal requirements of the State Water Resources Control Board's Geotracker program, all site analytical data post-July 1, 2005 will be submitted to the Geotracker database. The site groundwater monitoring wells were re-surveyed in September 2006 in order to provide Geotracker-compliant survey data. We are currently working to register the site in the Geotracker program and will begin uploading data once the site is registered.

Also, as requested in your letter of August 24, 2006, we will begin submitting reports in electronic format to the County's ftp site.

Schedule

After approval of soil gas vapor work by ACEH, the date for fieldwork will be determined. It is anticipated that the field work will be scheduled to commence within three weeks of work plan approval, subject to contractor availability and weather conditions, and that the fieldwork for the project will be completed within one day. The soil vapor sampling will not be conducted within two days of a significant rainfall event. A report presenting the soil vapor sampling results will be submitted within three weeks of the field work.

For the groundwater monitoring program, January through June will be considered the first semi-annual reporting period and July through December will be considered the second semi-annual reporting period.

Please call if you have any questions about this letter.

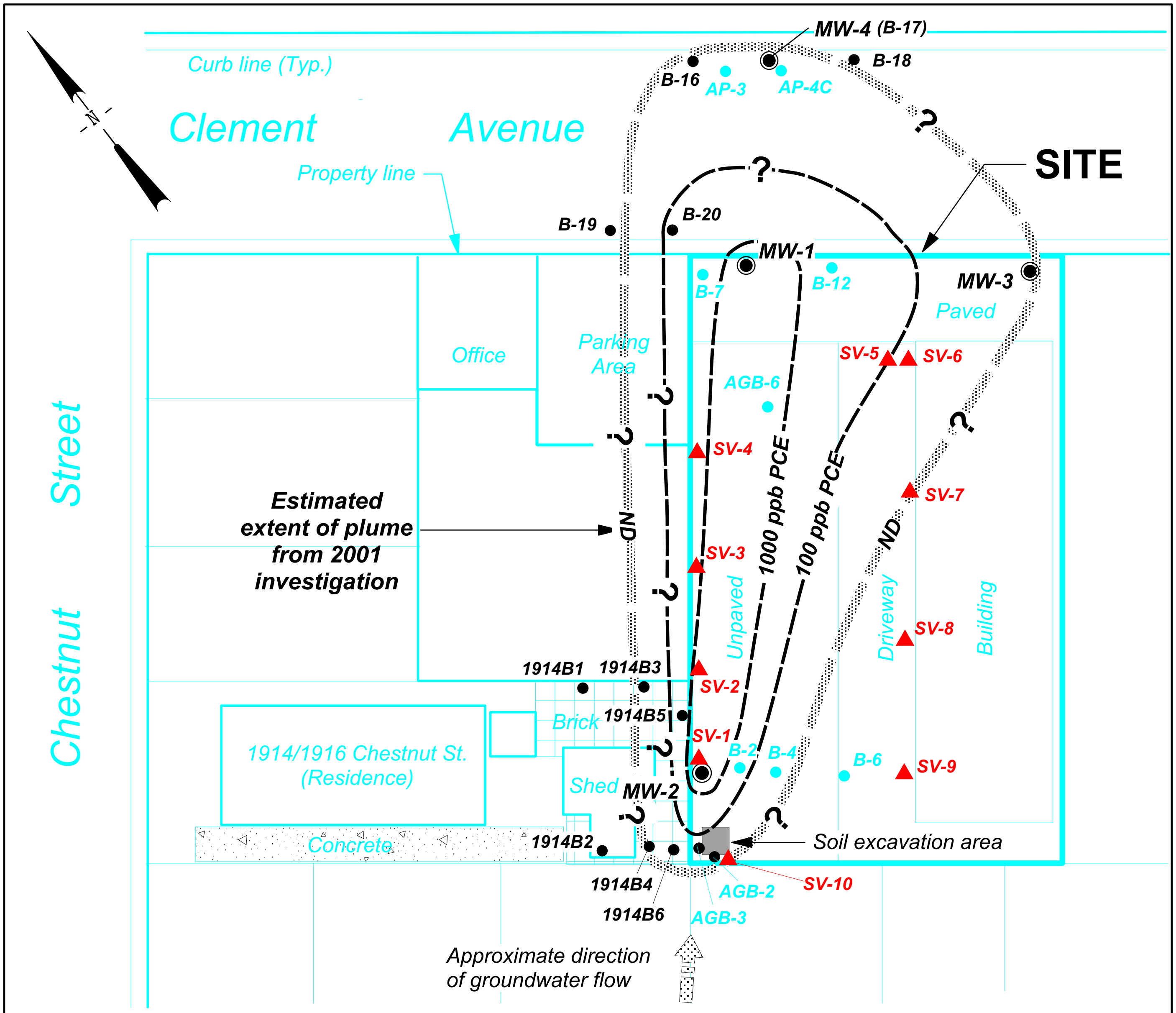
Sincerely,

CRAWFORD CONSULTING, INC.

Mark C. Wheeler, R.G. 4563
Principal Geologist

Attachments: Attachment A. TEG Soil Vapor Survey Methodology
Figure 1. Proposed Soil Vapor Sampling Locations

cc: Teri Peterson, Cargill Salt



2001 Results

SAMPLE DESIGNATION	SAMPLE DATE	PCE CONC. (µg/L)
MW-1	12/01	1400
MW-2	12/01	1700
MW-3	12/01	0.8
MW-4	12/01	2.6
B-16	12/01	1.9
B-17	12/01	3.4
B-18	12/01	ND
B-19	12/01	ND
B-20	12/01	120
1914B1	11/01	ND
1914B2	11/01	ND
1914B3	11/01	3.4
1914B4	11/01	1.1
1914B5	11/01	500
1914B6	11/01	10

ND=Not detected

EXPLANATION

- Monitoring well
- Grab groundwater sample (2001 investigation)
- Previous grab groundwater sample location
- Proposed soil vapor sampling location

0 40 Feet
Scale

CRAWFORD CONSULTING INC.

Project No. CS1605
Cargill Salt Dispensing Systems Division
2016 Clement Avenue, Alameda, California
Figure 1. Proposed Soil Vapor Sampling Locations

Workplan figure 1.dsf 11/6/06

ATTACHMENT A

SOIL VAPOR SURVEY METHODOLOGY

DTSC Protocols

Active Soil Vapor Sampling System

TEG's low-dead volume soil vapor sampling system has been inspected, endorsed, and is favored by all regulatory agencies who have seen it, including the EPA and CA DTSC. The design eliminates the risk of air leakage down the soil vapor probe, ensures sample collection from the tip, and greatly facilitates decontamination procedures.

Probe Construction

TEG's soil vapor probes are constructed of 1 inch outer diameter chrom-moly steel, equipped with a steel drop off tip. The Strataprobe can use a larger diameter probe if needed. Nominal lengths are 4 feet and additional lengths may be added to one another to achieve the required sampling depth. An inert 1/8 inch tube runs through the center of the probe and is attached to the sampling port with a stainless steel post run fitting.

Probe Insertion

The probe is driven into the ground with an electric rotary hammer, or with the Strataprobe. After inserted to the desired depth, the probe is retracted slightly, which opens the tip and exposes the vapor sampling port. This design prevents clogging of the sampling port and cross-contamination from soils during insertion. Once the probe rod is placed, the sample can be collected after waiting twenty minutes for equilibration.

Soil Gas Sampling

Soil vapor is withdrawn from the inert tubing using a calibrated syringe connected via an on-off valve. A purge volume test is conducted by sampling at the first soil vapor location three times after sequentially collecting and discarding one, three, and seven dead volumes of soil vapor gas to flush the sample tubing and fill it with in-situ soil vapor. The purge volume used prior to the sample yielding the highest analytical value is used for all subsequent sampling. After purging, the next 20cc to 50cc of soil vapor are withdrawn in the syringe, plugged, and immediately transferred to the mobile lab for analysis within the required holding time. During sampling, a leak check gas is used to confirm that the sample train and probe rod is tight and leak free. Additional soil vapor may be collected and stored in gas-tight containers (e.g. Summa canisters) as desired.

Flushing & Decontamination Procedures

To minimize the potential for cross-contamination between sites, all external probe parts are cleaned of excess dirt and moisture prior to insertion. The internal inert tubing and sampling syringes are flushed with large volumes of ambient air between samples or discarded as required. If water, dirt, or any material is observed in the tubing, the tubing is discarded and replaced with fresh tubing.

11350 Monier Park Place, Rancho Cordova, CA 95742 Phone: (916) 853-8010 Fax: (916) 853-8020