WASTE MANAGEMENT

Waste Management of Alameda County, Inc.
172 98th Avenue, Oakland, CA 94603

June 12, 2012

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Alameda County
Environmental Health

Alameda County Health Care Services Agency
Environmental Health Services, Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Attn: Mr. Jerry Wickham, PG, CEG, CHG
Senior Hazardous Materials Specialist

Transmittal: Work Plan for Additional Investigation
Former Waste Management Facility
6175 Southfront Road, Livermore, California
GeoTracker Global ID T10000003066
SLIC Case RO0003076

Dear Mr. Wickham:

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

Sincerely,
Waste Management

Barry Skolnick
Area Vice President
WM-California Bay Area

Attachment

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June 12, 2012

Brown AND Caldwell

Mr. Jerry Wickham
Senior Hazardous Materials Specialist
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

142782

Subject: Work Plan – Additional Investigation at Former Waste Management of Alameda County, Inc. property, 6175 Southfront Road, Livermore, California 94550

Dear Mr. Wickham:

This Work Plan was prepared by Brown and Caldwell on behalf of Waste Management of Alameda County, Inc. (WMAC) to conduct additional investigations at the former WMAC facility located at 6175 Southfront Road, Livermore, California (Site; Figure 1). The scope of work presented in the Work Plan is in accordance with the request for additional investigations from the Alameda County Department of Environmental Health (ACEH) presented in their letter dated March 26, 2012. The Site was formally used by WMAC as a regional operations yard. A fleet of refuse/recycling materials collection trucks operated from the facility and served the cities of Livermore and San Ramon. The collection trucks were stored, serviced and cleaned on the Site.

The purpose of this Work Plan is to document the proposed sample locations, numbers and analytical procedures and field methods that will be used to collect data during the additional investigation. Specifically, the Work Plan describes: the health and safety procedures that will be implemented during field activities, quality control procedures, and sampling rationale and methods proposed to collect and analyze environmental data at the Site. Environmental media including soil gas and groundwater will be sampled to further assess potential releases of substances that may be a risk to human health and the environment from previous operations on the Site. As discussed below for the Conceptual Site Model (CSM), review of previous data collected from the Site suggests actual reported values (highest value of 17 µg/L) and lateral extent indicate that there is a very low mass of vinyl chloride, which minimizes the potential for indoor air issues. The objective of this study is to confirm that there is a low mass of vinyl chloride and that the source of these detections is from the degradation of parent compounds such as tetrachloroethene and trichloroethene. The results of this investigation will also allow further assessment of the source area of the reported detections.

Site Background

The information provided in the Site background was compiled from reports provided by WMAC that were prepared by other Consultants.

Information generated during a Phase I Environmental Site Assessment (ESA) of the Site (SCS Engineers [SCS], February 17, 2010) indicated that one 10,000-gallon diesel underground storage tank (UST) and one 4,000-gallon gasoline/diesel UST formerly existed on the Site near the location where a 10,000-gallon diesel above ground storage tank (AST) once existed (Figure 2). The two USTs were reportedly installed in the early

1980s. Regulatory records indicate that both tanks and/or associated piping leaked and impacted soil and groundwater. The USTs were removed in April 1992. More than 1,000 cubic yards of impacted soil were excavated and disposed of off-site, and 6.2 million gallons of impacted groundwater were ultimately extracted, treated on-site and discharged to the sanitary sewer. The ACEH granted case closure on August 31, 1998. The closure letter stated that up to 380 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-g) and 1.3 ppm benzene remained in the soil beneath the Property, and up to 5.8 parts per billion (ppb) benzene remained in the groundwater beneath the Site.

In addition, a pressure wash area and clarifier were located on the Site. The steam pressure washer used injected soap and/or degreasers to wash equipment, disposal trucks, engines and parts at this location. Waste water from the pressure wash area was discharged to the sanitary sewer via a clarifier (Figure 2).

In July 2010, as part of the property transfer assessment, SCS conducted a Phase II investigation (SCS, August 30, 2010) to evaluate the potential for fuel-related vapor intrusion impacts (associated with the former USTs) to nearby structures and to evaluate the potential for subsurface environmental impacts in the vicinity of the pressure wash area, clarifier and associated sewer lines. The results of soil vapor samples indicated levels above environmental screening levels (ESLs) for commercial/industrial land use established by the San Francisco Bay Regional Water Quality Control Board for both benzene and vinyl chloride. Benzene was detected above its ESL of 0.28 micrograms per liter (µg/L) in the vicinity of the former USTs, and vinyl chloride was detected above the ESL of 0.1 µg/L in one soil vapor sample (SV-6) collected near a former maintenance shop (Figure 3). TPH was also reported above ESLs in one location near the wash rack.

Based on these results, the ACEH in its letter dated June 22, 2011, requested an additional investigation be conducted to:

- Identify the extent and source of vinyl chloride in soil vapor and other media
- Identify the source and extent of TPH in groundwater
- Assess the extent of benzene in soil vapor

A work plan to conduct this additional investigation was submitted to the ACEH on September 7, 2011 (Tetra Tech Geo [Tetra Tech], 2011). The objectives of the additional investigation agreed upon by ACEH were to: 1) acquire additional soil vapor data for volatile organic compounds (VOCs) in the vicinity of sample SV-6, in addition to evaluating groundwater for the presence of VOCs and TPH; and 2) acquire additional data on the presence of TPH in groundwater near the wash rack, in addition to evaluating potential TPH in soil. In ACEH's letter dated October 11, 2011, ACEH agreed with Tetra Tech's conclusion that the extent of benzene in soil vapor was defined by the existing data and that no further investigation of benzene in soil vapor was required.

The Tetra Tech additional investigation was conducted in January 2012 and included the collection of additional soil vapor, soil and groundwater samples (Tetra Tech, February 2012). Based on these results, Tetra Tech reported that:

- No TPH impacts were evident in soil and groundwater
- No TPH or VOC impacts were present in groundwater below the area of identified vinyl chloride impacts in soil vapor at SV-6
- Vinyl chloride was detected above ESLs in the area of SV-6 where vinyl chloride was previously detected

Brown and Caldwell has compiled the soil vapor, soil and groundwater sample data from the August 2010 and January 2012 investigations into Figures 3 and 4, respectively, which provide a summary of results for each media type.

Based on the results of the Tetra Tech additional investigation, the ACEH in its letter dated March 26, 2012, requested additional work to:

- Evaluate the potential for vapor intrusion to the Break Room/Offices adjacent to the reported vinyl chloride impacts in soil gas
- Identify the source of vinyl chloride

The ACEH also indicated that the groundwater samples collected during the January 2012 investigation were from a deeper zone and not considered to be first water. As such, reported results were not representative of potential shallow groundwater contamination. Based on this interpretation, the ACEH requested additional groundwater samples be collected from first water.

Conceptual Site Model (CSM). Based upon the data collected from previous investigations, Brown and Caldwell has developed a CSM that identifies data gaps at the Site. Based on our initial review, although the reported vinyl chloride detections are significantly above the ESL of 0.1 µg/L and the more conservative California Environmental Protection Agency's California Human Health Screening Level (CHHSL) of 0.0448 µg/L, the actual reported values (highest value of 17 µg/L) and limited lateral extent indicate that there is a very low mass of vinyl chloride, which minimizes the potential for indoor air issues. Furthermore, both the ESL and CHHSL values for vinyl chloride assume that the soil material beneath a building is coarse, unconsolidated sands. Based on the results of previous site investigations, the actual soil material directly below the Site consists of very low permeability tight clay. The low permeability of this material is demonstrated by the inability to collect a full summa canister sample in the area of the highest vinyl chloride detections, and would be expected based on the description of soil material on geologic boring logs (Tetra Tech, 2012). Using the actual material properties of the soil encountered at the Site in the equations used to develop the ESL and CHHSL values would result in a significantly higher risk-based value for indoor air at commercial properties.

The Phase I ESA stated "the Property (Site) was developed as a refuse collection truck operations yard in 1980/1981. Prior to this the Property (Site) appears to have been undeveloped and used for agricultural purposes". The ESA also stated "the majority of chemicals that exist on-site, with the exception of the AST, are stored and used in and around this structure" with the structure being the former maintenance shop. Based upon the ESA, it appears that any release of chlorinated solvent would have been after development of the property in 1980/1981, and the maintenance building would be a likely source of a spill or leak.

Vinyl chloride is a manufactured substance that does not occur naturally. Most of the vinyl chloride produced in the United States is used to make the polymer polyvinyl chloride, which uses a process that did not occur at the Site. At room temperature, vinyl chloride is a colorless gas with a boiling point of -13.37 degrees Celsius. With a Henry's Law constant value of 28.3 (dimensionless), vinyl chloride in water evaporates rapidly if it is near the ground surface. Vinyl chloride in the air also breaks down in a few days. Based on these physical parameters and former operations at the Site, it is highly unlikely to impossible that the source of vinyl chloride at the Site is from a spill of the pure product or waste water from manufacture of the product. Based on a review of the soil vapor data presented in the Tetra Tech investigation report, it is our opinion that the

reported vinyl chloride detections result from the reductive dechlorination of parent products such as tetrachloroethene (PCE) and trichloroethene (TCE), with the carbon source being the petroleum compounds also detected at the Site in soil vapor, soil and groundwater. Figure 3 provides the results of the soil vapor sampling conducted to date on Site. Vinyl chloride was only detected in three borings (SV-6, SV-13, and SV-14) all located just north of the break room and offices. Cis-1,2-dichloroethene (DCE) is produced by reductive dechlorination of TCE and PCE, and was also detected in the same borings as vinyl chloride (and not detected anywhere else on Site). The fact that the vinyl chloride concentrations are higher than the reported cis-1,2-DCE concentrations suggests that these impacts are the result of an old release of the parent compounds. The soil in the vicinity of the previous vinyl chloride detections is a silty clay from the surface to approximately 7.5 feet below ground surface (bgs) as indicated in Tetra Tech's boring log for SB-3. At 7.5 feet bgs there is a 3.5 feet zone of clayey sandy gravel that is dark greenish gray. This color can be indicative of a reduced soil environment common with fuel hydrocarbon releases. The soil from 11 feet bgs to 19 feet bgs is a silty clay that overlies a 2 foot thick sand lens from 19 feet bgs to 21 feet bgs.

Scope of Work

Brown and Caldwell proposes conducting sub-slab and sub-surface soil vapor sampling. This work will identify if there is potential for vapor intrusion frombeneath the Break Room/Offices within the former maintenance shop and further assess the extent of vinyl chloride in the sub-surface and shallow groundwater (if present).

Task 1: Health and Safety Plan

Prior to conducting work at the Site, Brown and Caldwell will create a health and safety plan that complies with OSHA requirements. The health and safety plan will include a map to the closest emergency room to the Site.

Task 2: Utility Clearance, Inventory of Building Contents and Permitting

Prior to conducting field work at the Site, Brown and Caldwell will:

- Contract with a utility locator to locate subsurface utilities at the Site
- Obtain a drilling permit from Zone 7 Water Agency

The utility survey will accomplish two tasks for the Site investigation: 1) clearance of boreholes for drilling as required by law, and 2) locating sub-surface utilities that may have acted as conduits or sources for sub-surface contamination. The locations of the utilities will be a factor in the selection of soil gas sampling locations.

Boring locations will be marked with white spray paint and Underground Service Alert (USA) will be contacted at least 48 hours prior to drilling. A boring permit will be obtained from Zone 7 Water Agency for the soil gas and groundwater borings.

Task 3: Sub-Slab Soil Gas Survey

As described in the Vapor Intrusion Guidance (DTSC, 2011) higher concentrations of soil gas may be observed under buildings than beside a building at the same depth. As the soil gas concentrations may be elevated beneath a building, sub-slab sampling can provide a better idea of soil gas concentrations under a building. Slabs are also generally constructed on an engineered fill that will be more porous than the subsurface silty clays and clayey silts present on site. As such, the soil below a concrete slab without cracks may become a collection point for vapors migrating upward through the

sub-surface. In order to assess whether there are any vapor intrusion concerns, sub-slab sampling will be incorporated into the site investigation procedures.

Following completion of the utility survey, sub-slab soil gas sampling will be conducted to better characterize potential vinyl chloride impacts on the building and the source of the vinyl chloride. Brown and Caldwell will contract with TEG of Northern California for direct push drilling and mobile laboratory services. Prior to collecting sub-slab samples, approximately three core holes will be drilled in the slab foundation by our field exploration subcontractor, TEG (Figure 5). Vapor samples will then be collected by placing a soil vapor probe into the sub-slab material and sealing it with bentonite. After 20 minutes of equilibration time, samples will be collected using a glass syringe by the TEG personnel and analyzed by the on-site laboratory. If results from the sample are below the mobile lab's detection limits, a one-liter summa canister with flow controller provided by Air Toxics, LTD (fixed laboratory located in Folsom, CA) to flow at 200 milliliters per minute (mL/min) will be used to collect a sample. Following collection of the samples, the tubing in the borings will be removed, and the concrete core filled with grout and brought to the existing surface. Samples will be located to minimize disturbance to the flooring material. Locations of the sub-slab samples will be discussed with the Site manager/contact prior to placement. The sub-slab soil gas samples will be analyzed for VOCs using the mobile laboratory using EPA Method 8260, and then by Air Toxics using EPA Method TO-15 if below mobile laboratory detection limits. Note that the standard turnaround time for sample analysis is 10 business days from sample receipt.

Task 4: Multi-depth Sub-surface Soil Gas Sampling

In addition to the sub-slab sampling, a multi-depth soil gas survey will be conducted to further assess the extent and source of vinyl chloride detections. Brown and Caldwell will use the multi-depth survey to provide the data necessary to vertically delineate the VOCs previously detected on Site. The proposed subsurface soil gas sampling locations are provided on Figure 5.

The survey will be conducted using both methods previously used at the Site: 1) the "post-run" method where samples are collected through a sampling tube into a syringe and the sample is analyzed immediately using an on-site mobile laboratory; and 2) the program where samples are collected from soil vapor probes directly into one- liter summa canisters. Both methods will be conducted in accordance with DTSC guidelines. The post-run method with on-site mobile laboratory will be conducted first to quickly assess current conditions and allow Brown and Caldwell to select subsequent sample locations. The mobile laboratory will analyze samples using USEPA Method 8260. The first location will be in the area with the reported detection of 17 µg/L vinyl chloride where samples will be collected at approximately five feet bgs (depth of Tetra Tech sample), 10 feet bgs and 20 feet bgs. Both deeper samples are intended to assess soil vapors within coarser grained zones identified during the Tetra Tech soil boring program. The deeper sample is also intended to assess VOC concentrations directly above groundwater. Also note, if a soil gas sample can be collected from the 20-foot depth, this will confirm that water samples collected during the Tetra Tech investigation did provide the data necessary to assess shallow groundwater impacts. Subsequent sampling locations will be placed by reviewing the results of initial soil gas samples and underground utility lines identified in Task 2. Because the mobile laboratory used for the post-run method cannot obtain detection limits below ESLs or CHHSLs, summa canister samples, analyzed by USEPA Method TO-15, will be collected at locations with

vinyl chloride reported below the detection limit. A total of six summa canisters will be collected for the multi-depth soil gas survey and submitted for VOC analysis using EPA Method TO-15 with SIM analysis.

Task 5: Groundwater Sampling

If a soil gas sample cannot be collected at 20 feet bgs at the initial location (indicating the possible presence of water), the direct push drilling program will install a well point using ¾" PVC pipe with 5 feet of screen to 20 feet bgs adjacent to prior soil vapor sampling location SV-14, which has the highest concentration of vinyl chloride in soil gas (Figure 5). The well point will be advanced immediately after completing the first soil gas location. At the end of the day, the well point will be checked for water. If water is present, samples will be collected using a peristaltic pump and disposable tubing. Samples will be collected in laboratory provided 40-milliliter volatile organic analysis (VOA) containers, and placed on ice before being submitted to an analytical laboratory for VOC analysis using EPA Method 8260. Note that the standard turnaround time for sample analysis is 5 business days from sample receipt.

Data Interpretation and Reporting

Brown and Caldwell will document the results of the field investigation and data interpretation in a report after receiving the completed analytical laboratory reports. The report will include figures, tabulated data and an update to the CSM, and will present a closure strategy for the Site.

Schedule

Brown and Caldwell is prepared to commence work immediately following acceptance of the Work Plan by ACEH. The field investigation will be initiated within three weeks of the Work Plan's approval, depending on the availability of subcontractors and weather conditions. The field investigation will be completed within two weeks of starting work. The report outlining the results of the investigation will be submitted to ACEH within four weeks of receiving the final analytical laboratory reports.

Should you have any questions, please do not hesitate to contact Mr. Joe Turner at (916) 853-5334.

Very truly yours,

Brown and Caldwell

Joseph B. Turner, PG #5125, CHG #454
Chief Hydrogeologist

cc: Project File

Attachments

Figures

DATE	PROJECT	SITE	
5-18-12	142782	6175 Southfront Road, Livermore, Callifornia	Figure 1
Brown AND Caldwell		TITLE: Project Site Location	

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Legend

Sanitary sewer line (with direction of flow)

SITE
6175 Southfront Road, Livermore, California

TITLE
Existing Site Features

Brown AND Caldwell

DATE 5/18/2012

PROJECT 142782

Figure 2

NORTH

0 50

Feet

Source: maps.google.com, 2011

P:\42000\142782 - WM Livermore Hauling Inv\Work Plan\Graphics

Legend

B	Benzene
T	Toluene
E	Ethylbenzene
X	Total Xylenes
cis 1,2-DCE	cis 1,2-Dicholoroehene
VC	Vinyl Chloride

Sample measurements are in micrograms per cubic meter (µg/m3)

SITE
6175 Southfront Road, Livermore, California

TITLE
Soil Vapor Sample Locations and Results

Brown AND Caldwell

DATE 5/18/2012

PROJECT 142782

Figure 3

Source: maps.google.com, 2011

Legend

TPH-g	Total Petroleum Hydrocarbons as Gasoline
TPH-d	Total Petroleum Hydrocarbons as Diesel Fuel
TPH-mo	Total Petroleum Hydrocarbons as Motor Oil
VOCs	Volatile Organic Compounds
NA	Not Analyzed
ND	Not Detected

Sample measurements are in micrograms per cubic meter (µg/m3)

SITE
6175 Southfront Road, Livermore, California

TITLE
Groundwater Sample Locations and Results

Brown AND Caldwell

DATE 5/18/2012

PROJECT 142782

Figure 4

Source: maps.google.com, 2011

Legend

- Historical Soil Vapor Locations

Proposed Sample Locations

- Sub-Slab Soil Vapor Locations
- Temporary Groundwater Sample
- Sub Surface Soil Vapor Locations

SITE
6175 Southfront Road, Livermore, California

TITLE
Proposed Soil Vapor and Groundwater Sample Locations

Brown AND Caldwell

DATE 5/18/2012

PROJECT 142782

Figure 5

Source: maps.google.com, 2011