aqua science engineers inc.

June 26, 2002

WORKPLAN
for a
SOIL AND GROUNDWATER ASSESSMENT
at
J&A Trucking Property
2221 Union Street
Oakland, California

Submitted by:
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1.0 INTRODUCTION

This submittal outlines Aqua Science Engineers, Inc. (ASE's) workplan for a soil and groundwater assessment at 2221 Union Street in Oakland, California (Figure 1). The proposed site assessment activities have been designed to further delineate the area of volatile organic compound (VOC) contamination in soil and groundwater previously identified in soil borings and monitoring wells at the site (Figure 2). This workplan is being prepared on behalf of our client and the current property owner, J&A Trucking, in response to the Alameda County Health Care Services Agency (ACHCSA) letter dated May 6, 2002 (Appendix A).

2.0 SITE HISTORY

The site houses two buildings, a concrete-surfaced yard and a dirt lot. It is currently owned by J&A Trucking for truck parts warehousing and repair. Previously, the site was the home of California Brake and Clutch. A Phase I Environmental Site Assessment prepared for the site identified a surface water drain located in the exterior yard area (Figure 2). The Phase I suggested drilling a soil boring near the drain for the collection of soil samples.

2.1 Hand Auger Drilling

On June 22, 1999, ASE removed the dirt and debris from the bottom of the drain, cored through the concrete bottom of the drain, and using a hand auger, drilled soil boring BH-A to a depth of 3-feet below the bottom of the drain (Figure 2). Soil samples BH-A @ 1' and BH-A @ 3' were collected from the boring. Soil sample BH-A @ 1' was analyzed by Chromalab, Inc. of Pleasanton, California (ELAP #1094) for total petroleum hydrocarbons as gasoline (TPH-G) and diesel (TPH-D) by EPA Method 8015M, benzene, toluene, ethylbenzene, and total xylenes (collectively known as BTEX) by EPA Method 8020, methyl tertiary butyl ether (MTBE) by EPA Method 8020, oil and grease by Standard Method 5520E, halogenated volatile organic compounds (HVOCs) by EPA Method 8010, and the LUFT five metals by EPA Method 6010. The only compound identified in the soil above action levels was tetrachloroethene (PCE) at 390 parts per million (ppm). Soil sample BH-A @ 3' was placed on hold at the laboratory. It was not subsequently analyzed because it was saturated, and had the same appearance and odor as the 1' sample.

2.2 Geoprobe Assessment

On July 12, 1999, ASE drilled six (6) soil borings at the site using a Geoprobe in an effort to delineate the extent of VOCs in soil and groundwater. Four of the borings were placed near the outdoor drain. Two of the borings were drilled inside one of the buildings at the location of two former parts cleaning bins that used methyl-ethyl-ketone (MEK) as a cleaning solvent (Figure 2). Detectable concentrations of PCE, up to 53 parts per billion (ppb), were identified in soil samples collected from borings BH-B and BH-C, near the former outdoor drain. Up to 230 ppb trichloroethene (TCE) and 17 ppb cis-1,2-dichloroethene (cis-1,2-DCE) were identified in soil samples collected from boring BH-C. None of the samples collected from the remaining soil borings contained detectable concentrations of any of the VOCs analyzed.

Grab water samples were collected from all seven of the borings. Detectable concentrations of VOCs were identified in all water samples except from borehole BH-G. Water samples from borehole BH-A had the most significant concentrations: 1,300 ppb PCE, 1,500 ppb TCE, and 190 ppb cis-1,2-DCE. The remaining compounds and concentrations were as follows: 42 ppb PCE in borehole BH-E; 170 ppb TCE in borehole BH-B; 130 ppb cis-1,2-DCE in borehole BH-B; 21 ppb trans-1,2-DCE in borehole BH-B; and 11 ppb 1,1-DCE in borehole BH-F. For complete details regarding the Geoprobe assessment activities, see the ASE report dated July 28, 1999.

2.3 Oil/Water Separator Identification

An unidentified underground pipe was noted exiting the outdoor drain. A request was made by Ms. Eva Chu of the ACHCSA to identify the endpoint of this pipe. On August 13, 1999, ASE subcontracted Subtronic Corporation to identify the pipe's path underground. An oil/water separator was identified approximately 15-feet northwest of the outdoor drain. The separator measured 4-feet square and approximately 3-feet deep. The underground piping connected the two units. An exit pipe was noted leaving the separator to the west and exiting the property underground, likely into a storm sewer pipe.

2.4 August 1999 Soil Borings and Well Installation

On August 27, 1999, Gregg Drilling of Martinez, California, drilled soil borings MW-1, MW-2, and MW-3 at the site using a Rhino drill rig equipped with 8-inch diameter hollow-stem augers (Figure 2). Groundwater monitoring wells MW-1, MW-2, and MW-3 were subsequently constructed in their respective borings.

The soil sample collected from soil boring MW-1 contained 18 ppb TCE and 180 ppb PCE. The soil sample collected from soil boring MW-2 contained 31 ppb PCE. The soil sample collected from soil boring MW-3 contained no HVOCs above the laboratory reporting limits.

The groundwater sample collected from monitoring well MW-1 contained 3.9 ppb cis-1,2-DCE, 58 ppb 1,1-DCA, 3.2 ppb TCE and 9.9 ppb PCE. The groundwater sample collected from monitoring well MW-2 contained 1.7 ppb cis-1,2-DCE, 4.5 ppb TCE and 48 ppb PCE. The groundwater sample collected from monitoring well MW-3 contained 34 ppb cis-1,2-DCE, 22 ppb 1,2-DCA, 21 ppb TCE and 38 ppb PCE. There were no other HVOCs detected in any of the groundwater samples analyzed above the laboratory reporting limits. For complete details regarding the monitoring well installation activities, see the ASE report dated September 27, 1999.

2.5 October 1999 Soil Boring and Well Installation

Using the three monitoring wells described in Section 2.4 above, the groundwater flow direction was measured and found to have a flow component toward the west. Because there was no monitoring well installed west of the outdoor drain, a fourth well was required. On October 27, 1999, ASE installed groundwater monitoring well MW-4 at the site in the location depicted on Figure 2. Soil and groundwater samples collected during this assessment were analyzed for VOCs by EPA Method 8010. The soil sample collected from boring MW-4 contained non-detectable concentrations of all the VOCs analyzed. The groundwater sample collected from monitoring well MW-4 contained 0.68 ppb PCE, 0.74 ppb TCE, 14 ppb 1,1-DCA, and 21 ppb cis-1,2-DCE 2.7 ppb 1,1-DCE, 2.1 ppb 1,2-DCA, 12 ppb chloroethane and 6.4 ppb vinyl chloride. For complete details regarding the installation of monitoring well MW-4 and the most recent four well sampling event, see the ASE report dated November 22, 1999.

2.6 November 1999 Soil Excavation, Backfilling and Offhaul

On November 15, 1999, ASE removed a 10-foot by 10-foot by 6.5-foot deep section of contaminated soil from below and around the yard drain (Figure 2). An organic vapor meter (OVM) was used to delineate the excavation boundaries. Approximately 24 cubic yards of soil were excavated and stockpiled on site.

Four confirmation soil samples were collected from the sidewall bottom interface of the four-sided excavation. A composite soil sample was collected from the stockpiled soil. All of the confirmation soil samples contained non-detectable concentrations of VOCs. The stockpiled soil sample contained 180 ppb PCE and 14 ppb TCE.

On November 18, 1999, the excavation was backfilled with imported material and resurfaced with concrete to match the existing surface.

On December 10, 1999, the stockpiled soil was removed from the site and deposited at the Forward, Inc. Landfill in Manteca, California. The stockpile contained 36.90 tons of soil.

For complete details regarding this portion of the project, see the ASE report dated November 30, 1999 and the Soil Offhaul letter dated December 15, 1999.

2.7 Groundwater Monitoring Well Sampling Events

Since their installation, monitoring wells MW-1, MW-2 and MW-3 were sampled six times between September 1999 and November 2000. Monitoring well MW-4 was been sampled five times since November 1999 and November 2000. The analytical results for these sampling events are tabulated in Table One.

No activities have been conducted at the site since November 2000.

3.0 PROPOSED SCOPE OF WORK (SOW)

ASE has prepared the following scope of work (SOW) to assess the subsurface soil and groundwater upgradient and downgradient of the former drain to delineate the extent of VOC contamination in soil and groundwater on site, and to determine if a regional VOC problem exists. ASE's proposed SOW is as follows:

1) Prepare this workplan and site specific health and safety plan for approval by Ms. Eva Chu of the ACHCSA.

2) Obtain a subsurface drilling permit from the Alameda County Public Works Agency (ACPWA). Obtain an excavation permit from the City of Oakland to allow for drilling in a public right-of-way. Call Underground Service Alert (USA) to have all public utilities in the area marked prior to drilling.

3) Using a Geoprobe hydraulic sampling rig, drill nine (9) soil borings to a depth of 10-feet below ground surface (bgs) at the locations shown on Figure 3, attached.

4) Collect soil samples continuously from each boring as drilling progresses for chemical analysis and hydrogeologic description. Screen the soil samples with a hand-held organic vapor meter (OVM) to determine the depth of highest VOC concentrations in soil. Collect a grab groundwater sample from each boring.

5) Analyze one (1) soil and one (1) water sample from each soil boring at a CAL-EPA certified environmental laboratory for VOCs by EPA Method 8010.

6) Backfill the borings with neat cement.

7) Prepare a report detailing the methods and findings of the investigation. The report will be submitted under the seal of a registered geologist or professional engineer.

Details of the assessment are presented below.

TASK 1 - PREPARE A WORKPLAN AND HEALTH AND SAFETY PLAN

ASE has prepared a site-specific health and safety plan which will be on-site during assessment activities.

TASK 2 - OBTAIN NECESSARY PERMITS

ASE will obtain a drilling permit from the ACPWA and an excavation permit from the City of Oakland. ASE will also notify Underground Service Alert (USA) to have underground utility lines marked in the site vicinity.

TASKS 3 & 4- DRILL SOIL BORINGS AT THE SITE AND COLLECT SOIL AND GROUNDWATER SAMPLES FROM THE BORINGS

ASE will drill nine (9) soil borings on-site at the locations shown on Figure 3. The borings will be drilled using a Geoprobe or similar type drill rig. The drilling will be directed by a qualified ASE geologist. Undisturbed soil samples will be collected continuously for subsurface hydrogeologic description and possible chemical analysis. The samples will be described by the ASE geologist according to the Unified Soil Classification System. The samples will be collected in brass or acetate tubes using a drive sampler advanced ahead of the boring as the boring progresses. Each sample will be immediately removed from the sampler, trimmed, sealed with Teflon tape and plastic caps, secured with duct tape, labeled with the site location, sample designation, date and time the sample was collected, and the initials of the person collecting the sample. The samples will be placed into an ice chest containing wet ice for delivery under chain of custody to a CAL-EPA certified analytical laboratory.

Soil from the remaining tubes not sealed for analysis will be removed for hydrogeologic description and will be screened for volatile compounds with an organic vapor meter (OVM). The soil will be screened by emptying soil from one of the tubes into a plastic bag. The bag will be sealed and placed in the sun for approximately 10 minutes. After the hydrocarbons have been allowed to volatilize, the OVM will measure the vapor through a small hole, punched in the bag. These OVM readings will be used as a screening tool only since these procedures are not as rigorous as those used in an analytical laboratory.

A groundwater sample will then be collected from all six borings. Drilling will be halted at the water table and a Powerpunch or similar type device will be utilized to collect groundwater samples from the borings. The groundwater samples will be contained in 40-ml volatile organic analysis

(VOA) vials, preserved with hydrochloric acid and sealed without headspace. All samples will be labeled with the site location, sample designation, date and time the samples were collected, and the initials of the person collecting the samples. The samples will then be cooled in an ice chest with wet ice for transport to a state-certified analytical laboratory under chain-of-custody.

All sampling equipment will be cleaned in buckets with brushes and a TSP or Alconox solution, then rinsed twice with tap water. Rinsates will be contained on-site in 55-gallon steel drums for future disposal by the client.

TASK 5 - ANALYZE THE SOIL AND GROUNDWATER SAMPLES

The grab groundwater samples and one soil sample from each boring will be analyzed at a CAL-EPA certified environmental laboratory for VOCs by EPA Method 8010. The soil sample from each boring chosen for analysis will be the one that appears to have the highest VOC concentration based on OVM readings.

TASK 6 - BACKFILL THE BORINGS WITH NEAT CEMENT

Following collection of the soil and groundwater samples, the boreholes will be backfilled with neat cement placed by tremie pipe.

TASK 7 - PREPARE A SUBSURFACE ASSESSMENT REPORT

ASE will prepare a report outlining the methods and findings of this assessment. The report will be submitted under the seal of state registered civil engineer or geologist. This report will include a summary of all work completed during this assessment including tabulated soil and groundwater analytical results, conclusions and recommendations. Copies of the analytical report and chain of custody will be included as appendices.

SCHEDULE

Drilling is tentatively scheduled for the week of July 15, 2002.

We appreciate your time and effort in approving this workplan in such a short time. Should you have any questions or comments, please call us at (925) 820-9391.

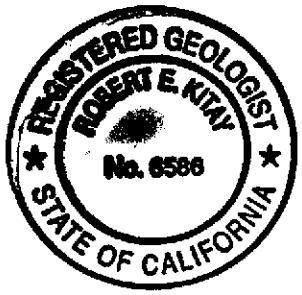
Respectfully submitted,

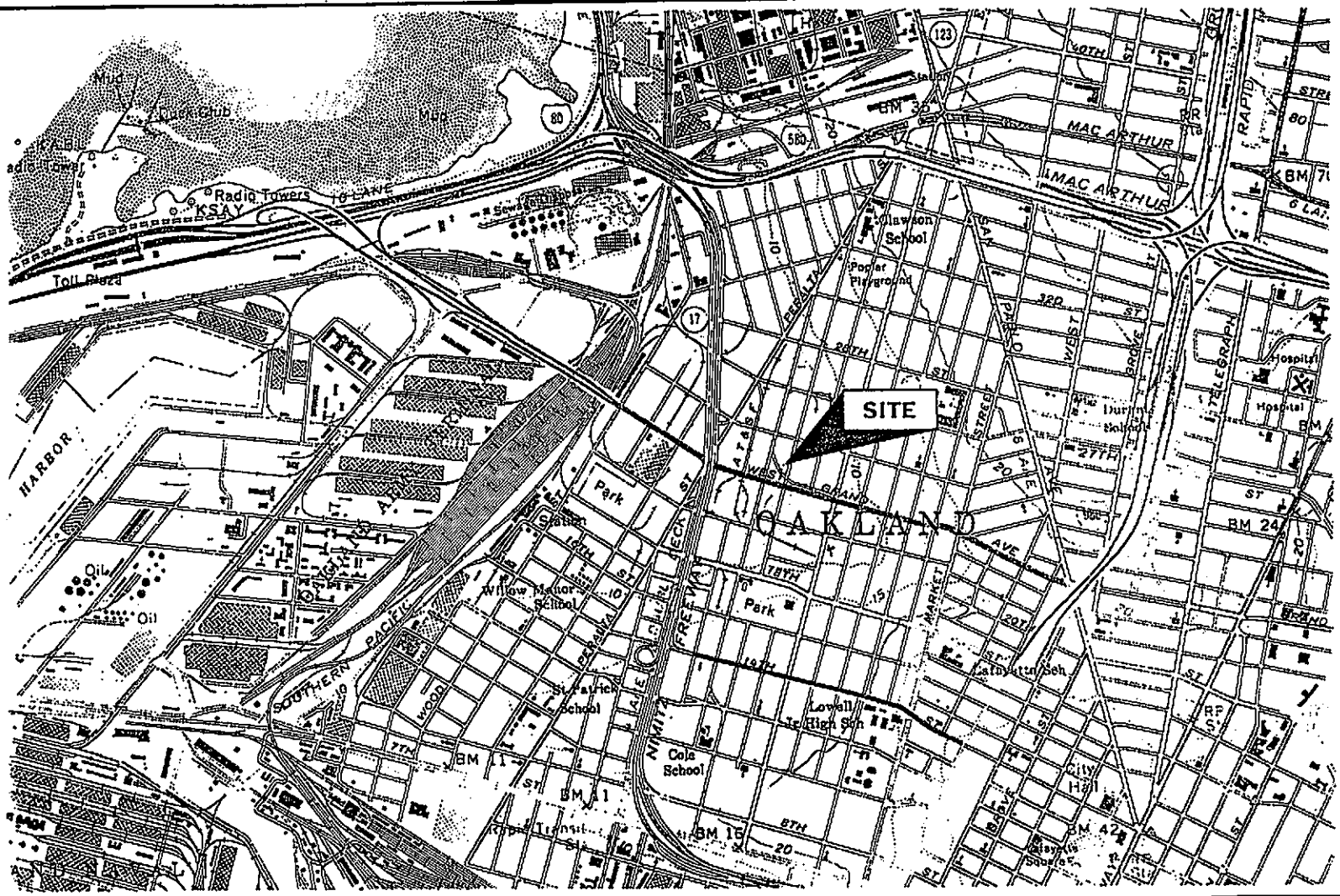
AQUA SCIENCE ENGINEERS, INC.

David Allen
Senior Project Manager

Robert E. Kitay, R.G., R.E.A.
Senior Geologist

Copies to: Ms. Eva Chu, ACHCSA
Mr. Alejandro Aguilar, Owner, J&A Trucking





LOCATION MAP

2221 Union Street
Oakland, California

AQUA SCIENCE ENGINEERS, INC. | Figure 1

NEIGHBORING PROPERTY

FENCED-IN,
DIRT SURFACE
YARD

FENCE

OIL / WATER SEPARATOR

MW-1

BH-B

OUTDOOR DRAIN

BH-G

BH-A

BH-C

MW-4

MW-2

EXCAVATION BOUNDARIES

BUILDING

SIDEWALK

FENCE

BH-D

POPLAR STREET

MEZZANINE

BUILDING

SIDEWALK

UNION STREET

BH-F

MW-3

BH-E

PARTS CLEANING BINS

NEIGHBORING PROPERTY

SIDEWALK

0 30 60 90

SCALE IN FEET

NORTH

LEGEND

BH-G ● ASE Soil Boring

MW-4 ⊕ ASE Monitoring Well

SITE PLAN

J & A TRUCKING FACILITY
2221 UNION STREET
OAKLAND, CALIFORNIA

AQUA SCIENCE ENGINEERS, INC. | FIGURE 2

NEIGHBORING PROPERTY

FENCED-IN,
DIRT SURFACE
YARD

FENCE

OIL / WATER SEPARATOR

MW-1

BH-B

OUTDOOR DRAIN

BH-G

BH-A

BH-C

MW-2

MW-4

BUILDING

SIDEWALK

FENCE

BH-D

POPLAR STREET

MEZZANINE

BUILDING

SIDEWALK

BH-F

MW-3

BH-E

PARTS CLEANING BINS

NEIGHBORING PROPERTY

UNION STREET

SIDEWALK

LEGEND

BH-G ● ASE Previously Drilled Soil Boring

MW-4 ⊕ ASE Monitoring Well

△ Proposed Soil Boring

0 30 60 90

SCALE IN FEET

NORTH

PROPOSED BORING LOCATION MAP

J & A TRUCKING FACILITY
2221 UNION STREET
OAKLAND, CALIFORNIA

AQUA SCIENCE ENGINEERS, INC. | FIGURE 3

TABLE ONE

Summary of Chemical Analysis of **Water Samples**
Volatile Organic Compounds
All results are in **parts per billion**

SAMPLE NAME	DATE	PCE	TCE	CIS 1,2-DCE	TRANS 1,2-DCE	1,1-DCA	1,1-DCE	1,2-DCA	CHLORO-ETHANE	VC	REMAINING VOCs
MW-1	9/2/99	9.9	3.2	3.9	< 1	58	< 1	< 1	< 1	< 1	< 1 - < 10
	11/2/99	100	15	17	3.4	1.7	< 1	< 1	< 1	< 1	< 1 - < 10
	2/7/00	510	160	8	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0 - < 20
	5/16/00	260	73	10	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0 - < 20
	8/8/00	38	19	21	8.7	1.2	< 0.5	< 0.5	< 0.5	17	< 0.5 - < 5.0
	11/30/00	**110**	**45**	**9.0**	**< 2.5**	**< 2.5**	**< 2.5**	**< 2.5**	**< 2.5**	**4.2**	**< 2.5 - < 25**
MW-2	9/2/99	48	4.5	1.7	< 1	< 1	< 1	< 1	< 1	< 1	< 1 - < 10
	11/2/99	110	9.5	1.4	< 1	< 1	< 1	< 1	< 1	< 1	< 1 - < 10
	2/7/00	200	21	6.6	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5 - < 10
	5/16/00	820	220	74	< 10	< 10	< 10	< 10	< 10	< 10	< 10 - < 40
	8/8/00	280	82	33	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0 - < 20
	11/30/00	**660**	**360**	**130**	**< 10**	**< 10**	**< 10**	**< 10**	**< 10**	**< 10**	**< 10 - < 100**
MW-3	9/2/99	38	21	34	< 0.5	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5 - < 5
	11/2/99	59	21	35	< 0.5	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5 - < 5
	2/7/00	56	13	22	< 0.5	8.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5 - < 5
	5/16/00	54	8.7	< 1	< 1	5.3	< 1	< 1	< 1	< 1	< 1 - < 10
	8/8/00	74	11	17	< 1.0	12	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 - < 4.0
	11/30/00	**63**	**14**	**25**	**< 1.0**	**14**	**< 1.0**	**< 1.0**	**< 1.0**	**< 1.0**	**< 1.0 - < 10**
MW-4	11/2/99	0.68	0.74	21	< 0.5	14	2.7	2.1	12	6.3	< 0.5 - < 5
	2/7/00	14	4.1	18	< 0.5	8.1	0.64	< 0.5	0.71	6	< 0.5 - < 5
	5/16/00	24	13	12	< 0.5	19	< 0.5	< 0.5	< 0.5	0.75	< 0.5 - < 5
	8/8/00	2.1	7.4	17	< 0.5	8.3	1.8	1.9	3.1	9.6	< 0.5 - < 5.0
	11/30/00	**30**	**6.9**	**2.8**	**< 0.5**	**8.3**	**< 0.5**	**< 0.5**	**< 0.5**	**< 0.5**	**4.6***
OAKLAND RBCA		200,000	460,000	2,100,000	3,000,000	940,000	16,000	170,000	NA	4,400	VARIES
DHS MCLs		5	5	6	10	5	6	0.5	NA	0.5	VARIES

NOTES:

Non-detectable concentrations are noted by the less than sign (<) followed by the laboratory detection limit.

The Oakland risk based corrective action (RBCA) number is the cleanup goal for vapor intrusion from groundwater to an INDOOR AIR Scenario modified for groundwater at depths of 6-feet below ground surface.

The DHS MCLs are the California Department of Health Services maximum contaminant levels for drinking water

PCE is Tetrachloroethene
TCE is Trichloroethene
DCE is Dichloroethene
DCA is Dichloroethane
VC is Vinyl Chloride
* = 1,1,1-Trichloroethane

APPENDIX A

ACHCSA Letter Dated May 6, 2002