RO 2446

AUGEAS

Alameda County
FEB 10 2
Environmental Health

March 25, 2003

Mr. Mark Mason
750 Battery Street, Suite 500
San Francisco, California 94111

SUBJECT: Additional Site Investigation Report for Dublin Retail Center, 7900-7916 Dublin Boulevard, Dublin, California

Dear Mr. Mason:

On behalf of Mark Mason (property manger for Allan Sebanc [property owner]), Augeas Corporation (Augeas) has prepared this Additional Site Investigation Report for work conducted at the above-referenced site. The work was conducted pursuant to the Alameda County Environmental Health Services (ACEHS) approved Workplan for Additional Site Investigation, dated 11/19/02. The purpose of the work is to further define the extent of petroleum hydrocarbons in soil and groundwater beneath the subject site. All proposed work will be conducted in accordance with guidelines established by the California Regional Water Quality Control Board (CRWQCB), City of Dublin, ACEHS, Zone 7 Alameda County Flood Control and Water Conservation District, Augeas Corporation's Standard Operating Procedures (SOPs) in Appendix A.

Scope of Work

Work conducted at the subject site included:

- Obtaining all necessary agency permits and providing notification of scheduled operations prior to the commencement of field activities;
- Contacting Underground Service Alert (USA) and/or a private utility locator to identify the work area for underground municipal utilities;
- Advancing six (6) Geoprobe® soil borings to approximately 24 feet below ground surface (bgs) in the vicinity of the former USTs and dispenser islands;
- Collecting soil samples at approximately 4-foot intervals during drilling activities for lithologic description and possible chemical analysis;
- Collecting "grab" groundwater samples from all of the soil borings for chemical analysis;
- Analyzing groundwater and selected soil samples for total petroleum hydrocarbons as gasoline (TPHg) and as diesel (TPHd) by EPA Method 8015Cm, benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8021B, and fuel oxygenates (including MTBE) by EPA Method 8260B; and
- Preparing a written report presenting findings, conclusions, and recommendations.

Auburn	Half Moon Bay	Santa Barbara	Santa Cruz
Post Office Box 477	Post Office Box 940	15 W. Carrillo, #211	548 Seabright Ave. #B
Auburn, CA 95604	Half Moon Bay, CA 94019	Santa Barbara, CA 93101	Santa Cruz, CA 95062
Telephone 530.888.7855	Telephone 650.726.7700	Telephone 805.564.8288	Telephone 831.425 8007
Facsimile 530.885.7247	Facsimile 650 726.1217	Facsimile 805 564.8282	Facsimile 831 425.8006

Site Location and Description

The subject site is located at 7900-7916 Dublin Boulevard in Dublin, California (Figure 1). The property consists of one building with four units and an associated parking area. The existing building totals approximately 13,500 square feet in area. The property was formerly used as an ARCO service station from 1975 to 1984. Prior to the gas station, the property was vacant agricultural land. The locations of the building and other pertinent site features, including USTs, are shown on Figure 2.

Previous Work

Underground Storage Tank Removal

Local environmental agency records have no information regarding the removal of underground storage tanks (USTs), nor results from confirmatory soil sampling at the subject site. However, according to documents on file at the City of Dublin Building Department, the USTs and associated piping/fuel dispensers were removed in 1984 prior to the construction of the existing building. The only available field evidence suggesting excavation or over-excavation is a soils report prepared prior to the construction of the existing building (Cleary Consultants, Inc., 1984) stating that approximately 14 feet of fill material was imported to the site.

Phase I Environmental Assessment

In May 1998, Hillmann Environmental Company, Inc. (HECO) conducted a Phase I Environmental Assessment identifying possible areas of environmental concern and presenting recommendations for action at the subject property. The assessment included a site reconnaissance to identify sensitive receptors, existing physical structures, neighboring properties and their current usage, and any possible environmental liabilities. The assessment also included a complete file review, interviews with individuals familiar with site operations, and photographic documentation of current site and offsite conditions. HECO discovered groundwater beneath the site to be at a depth of approximately 25 feet below ground surface (bgs) and flowing toward the east-northeast. Environmental concerns noted by HECO included the lack of UST removal documentation pertaining to the former ARCO service station at the site. HECO also identified the Chevron service station located approximately 600 feet northwest and upgradient of the subject property as having the potential to affect environmental conditions beneath the site. The Chevron service station is listed as an active LUST site with free phase product in groundwater. HECO recommended performing a limited phase II subsurface investigation to assess the absence or presence of residual petroleum hydrocarbons in soil and/or groundwater beneath the subject property as a result of previous site activities.

On August 31, 1998, Augeas personnel advanced one soil boring (B-1, designated as AB-1A, AB-1B, and AB-1C) to approximately 15 feet bgs, in the vicinity of the former pump island, using hand-held auger equipment. On September 2, 1998, Augeas personnel advanced one soil boring (B-2) to approximately 30 feet bgs, downgradient from boring B-1, using Geoprobe® technology. Soil samples were collected at 5-foot intervals, changes in lithology, and the soil/water interface. During the advancement of soil boring B-2, one "grab" groundwater sample (GW-1) was collected in order to evaluate groundwater beneath the site for the presence of petroleum hydrocarbons.

Soils encountered beneath the subject site were primarily mixtures of silts and clays with intermittent sand stringers. Groundwater was encountered at approximately 27 feet bgs. A site–specific groundwater gradient and flow direction could not be determined because no groundwater monitoring wells exist at this site. However, groundwater data from the nearby Chevron station indicated an easterly flow direction with fluctuations from east-northeast to southeast.

Concentrations of TPHg, TPHd, BTEX, and MTBE were not detected at or above laboratory detection limits in any of the soil samples analyzed. Analytical results for the "grab" groundwater sample (GW-1) indicated concentrations of TPHg at 440 micrograms per liter (μg/L), TPHd at 1,000 μg/L, and MTBE at 160 μg/L. Concentrations of benzene were not detected at or above laboratory limits in sample GW-1

A review of sensitive receptors in the site vicinity indicated only one water supply well located approximately 1/2 mile northwest (upgradient) of the subject property (Figure 1). The sensitive receptor survey also indicated that no surface water bodies were identified within a 1/4-mile radius of the subject site. Additionally, groundwater in the vicinity of this site has no beneficial use.

A review of files from a Chevron Service Station (7007 San Ramon Valley Boulevard) located approximately 660 feet upgradient of the subject site, revealed free phase floating product on groundwater beneath this site and dissolved hydrocarbons including MTBE that extend off-site.

Site Investigation

Permitting and Utility Checks

Prior to field activities, a drilling permit was obtained from the Zone 7 Alameda County Flood Control and Water Conservation District (Permit No. 23009). A copy of the permit is included in Appendix B. In addition, Underground Service Alert (USA) was notified prior to commencement of fieldwork to identify the public service utilities in the work area.

Geoprobe® Soil Borings

On February 21, 2003, Augeas supervised Environmental Control Associates, Inc., of Tahoe City, California during the advancement of six (6) Geoprobe® soil borings (GP-1 through GP–6) at the subject site. The soil borings were advanced to total depths of approximately 24 feet bgs using a truck-mounted drill rig equipped with Geoprobe® direct push technology. An Augeas geologist was present to supervise drilling and collect soil samples for lithologic description and possible chemical analysis. Additionally, "grab" groundwater samples were collected from all six Geoprobe® soil borings for chemical analysis. The locations of the soil borings are presented in Figure 2.

Soil Boring Destruction

Once soil and "grab" groundwater samples were collected, each borehole was backfilled to surface grade with neat cement containing approximately five (5) percent bentonite powder. Where appropriate, the upper 0.5-foot of borehole was backfilled with concrete.

Soil Classification and Sample Collection

During all drilling activities, soil from the borings was described and classified according to the Unified Soil Classification System (USCS). Logs of the soil borings are presented in Appendix C. Soil samples were collected from each Geoprobe® boring at approximately 4–foot intervals, at changes in lithology, and at the air/water interface, as described in Appendix A. Selected soil samples collected from the borings were submitted to a state-certified analytical laboratory for chemical analysis. Soil samples were also field screened for the presence of volatile organic compounds (VOCs) using a photoionization detector (PID).

"Grab" groundwater samples were collected from all six Geoprobe borings (GP-1 through GP-6). Groundwater sampling, handling, and preservation protocols were performed in accordance with Augeas Corporation's SOPs provided in Appendix A.

Laboratory Analysis of Soil and Groundwater Samples

Soil and groundwater samples collected from the soil borings were analyzed for TPHg and TPHd by EPA Method 8015Cm, BTEX by EPA Method 8021B, and fuel oxygenates (including MTBE), ethanol, methanol, 1,2-DCA, and EDB by EPA Method 8260B. Copies of the chain-of-custody records and analytical laboratory reports for the soil and groundwater samples are included in Appendices D and E, respectively.

Waste Disposal

Soil cuttings and rinseate water generated during drilling activities were temporarily stored on-site in labeled, U.S. Department of Transportation (DOT)-approved 55-gallon drums pending proper disposal.

Results of Site Investigation

Subsurface Conditions

During drilling activities, soils encountered consisted of a mixture of silt and clay from ground surface to approximately 24 feet bgs with minor sand lenses. Groundwater was first encountered at a depth of approximately 19 feet bgs.

Soil Analytical Results

Soil samples collected from the six Geoprobe® borings indicated that TPHg, BTEX, DIPE, ETBE, MTBE, TAME, TBA, ethanol, methanol, EDB, and 1,2-DCA were not detected at or above laboratory detection limits. TPHd was detected in four soil samples at concentrations ranging from 1.0 mg/kg (GP-6 @ 10') to 1.9 mg/kg (GP-5 @ 8'). Soil analytical results are presented in Table 1 and a copy of the soil analytical report is included in Appendix D.

Groundwater Analytical Results

Fuel related compounds were detected in all six "grab" groundwater samples collected from the Geoprobe® boring locations. TPHg was detected in GP-5 at a concentration of 120 μg/L. TPHd was detected in all six boring locations at concentrations ranging from 62 μg/L (GP-3-W) to 1,200 μg/L (GP-4-W). Of the BTEX constituents, only ethylbenzene and xylenes were detected at or above laboratory detection limits. Ethylbenzene and xylenes were detected in GP-5-W at concentrations of 6.9 μg/L and 48 μg/L, respectively. MTBE was detected at concentrations ranging from 1.4 μg/L (GP-2-W) to 77 μg/L (GP-3-W). TBA was detected in GP-4-W at a concentration of 13 µg/L. Groundwater analytical results are presented in Table 1 and a copy of the groundwater analytical report is included in Appendix E.

Discussion of Analytical Results

The only fuel-related compound detected in soil was TPHd. Soil samples collected from the vicinity of the former UST pit and the southeast portion of the property indicated relatively low concentrations of TPHd (highest was 1.9 mg/kg from GP-5@8'). Only 4 of the 12 soil samples collected indicate residual hydrocarbons (diesel only). The limited extent of residual diesel does not appear to pose further threat to groundwater quality beneath the site. Note that there is no beneficial use of groundwater in the site vicinity.

TPHd was detected in all six groundwater samples and the highest concentration (1,200 µg/L) was detected in the northeast portion of the property (GP-5-W). TPHg was detected in only one sample collected from the southeast portion of the property (GP-5-W). MTBE was detected in groundwater samples collected along the northern portion of the property. The gasoline related compounds are most likely the result of offsite migration of the contaminant plume from the nearby Chevron Station, located up gradient of the subject site.

Conclusions

Based on previous and current site data, Augeas concludes the following:

- Groundwater was encountered in a mixture of silt and clay soils at approximately 19 feet bgs and appears to be unconfined;
- Petroleum hydrocarbon compounds as diesel were detected in soil at low concentrations in the southeastern portion of the site, the highest concentration was detected in GP-5 at 1.9 mg/kg;
- Based on the limited extent of hydrocarbon-impacted soil at the site, it appears that the majority of hydrocarbon-impacted soil was removed during the UST removal in 1984;
- Gasoline fuel related compounds were not detected in any of the soil samples collected;
- Concentrations of TPHd were detected in groundwater samples from each boring, the highest concentration was in GP-4 (1,200 µg/L);
- TPHg was detected in groundwater from one soil boring (GP-5) at a concentration of 120 µg/L;
- Concentrations of MTBE in groundwater were detected in the northern portion of the site at concentrations ranging from 1.4 µg/L (GP-2) to 77 µg/L (GP-3); and

- Gasoline fuel compounds detected in groundwater, primarily in the northern portion of the site, are believed to have originated from the Chevron Station located up-gradient of the subject site.

Recommendations

Based on previous and current site data, Augeas recommends no further work be conducted at the subject site and that the site be reviewed for closure.

References

Augeas Corporation, 2002, "Site Investigation and Closure Documentation for Dublin Retail Center, 7900-7916 Dublin Boulevard, Dublin, California."

Diblee, T. W. Jr., 1980, Preliminary Geologic Map of the Diablo Quadrangle, Alameda and Contra Costa Counties, California, USGS OFR 80-546.

California Underground Storage Tank Regulations, May 5, 1994, Title 23, Division 3, Chapter 16.

Cleary Consultants, Inc., June 8, 1984, "Dublin Plaza Commercial Building, Dublin Boulevard and Regional Street, Dublin, California."

Hillman Environmental Company, Inc., June 3, 1998, "Phase I Environmental Site Assessment, Dublin Retail Center, 7900-7916 Dublin Boulevard, Dublin, California."

Tri-Regional Board, 1990, "Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites," August 10.

State Water Resources Control Board, 1989, "Leaking Underground Fuel Tank Leak Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure," California Environmental Protection Agency, October.

Limitations

All statements, conclusions, and recommendations in this report are based solely upon field observations and analytical test results related to work performed by Augeas Corporation. However, no investigation is ever thorough enough to perfectly characterize a potentially contaminated property, and we do not make representations to this effect for this property.

Another primary limitation of this and most other investigations is that site conditions and the application of environmental regulations are subject to change with time. Our recommendations result only from the interpretation of present conditions and available site information. Future site conditions, or a re-evaluation of State and County contamination guidelines, could affect some of the conclusions and recommendations in this report.

Should you have any questions, please contact Augeas at (831) 425-8007 or (650) 726-7700.

Sincerely,
AUGEAS CORPORATION

KEITH M. McVICKER
No. 6767

Joe Mangine
Project Geologist

Keith M. McVicker, R.G. 6767
Vice President

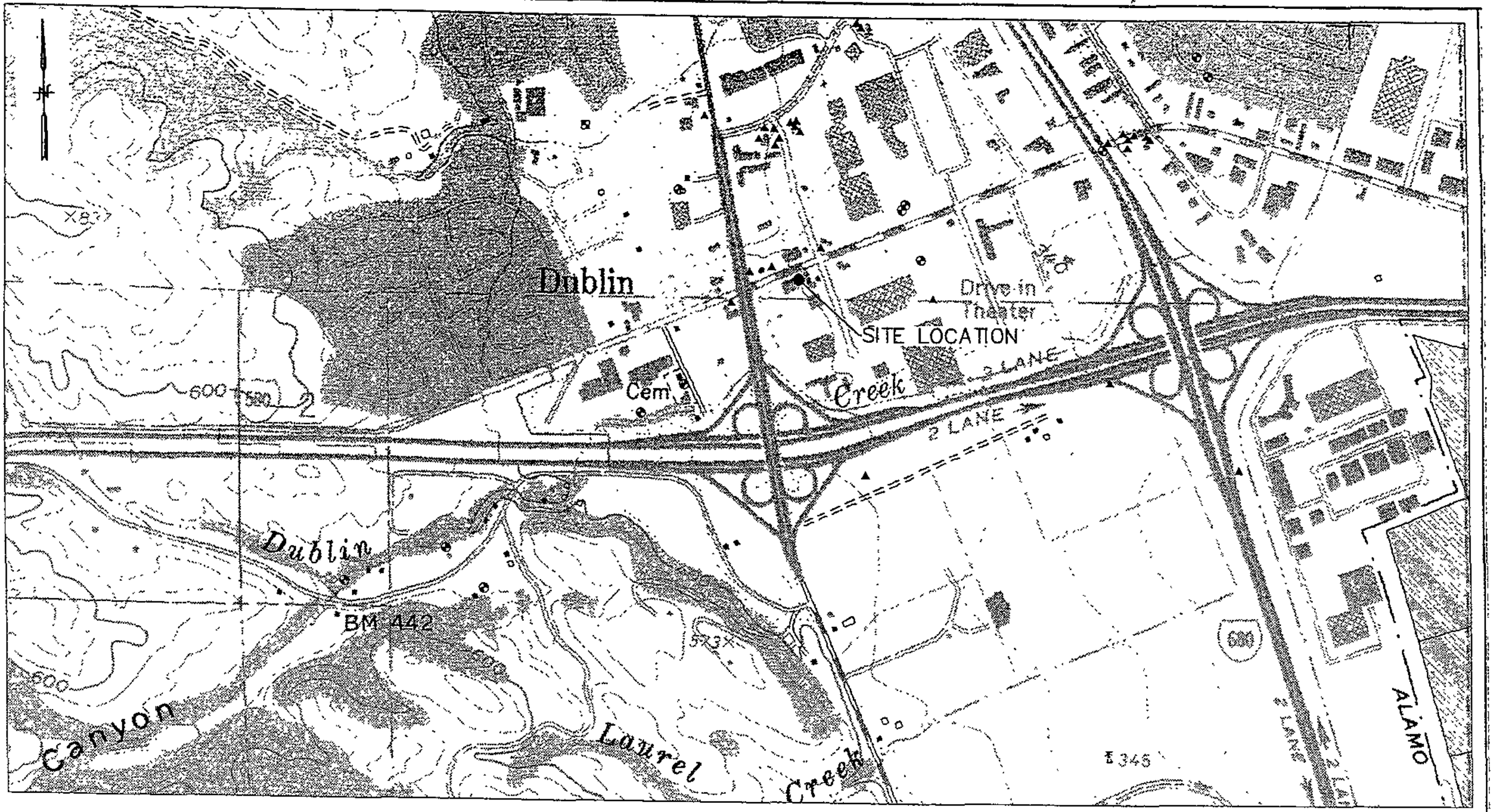
enclosures:

List of Figures
Figure 1, Vicinity Map
Figure 2, Site and Geoprobe Location Plan

List of Tables
Table 1, Historical Soil Analytical Results
Table 2, Historical Groundwater Analytical Results

List of Appendices
Appendix A: Augeas Corporation's Standard Operating Procedures
Appendix B: Well Construction Permit
Appendix C: Unified Soil Classification System, Soil Boring Logs
Appendix D: Soil Certified Analytical Reports and Chain of Custody
Appendix E: Groundwater Certified Analytical Reports and Chain of Custody

Figures



LEGEND:

- ▲ MONITORING WELL LOCATION
- ⊕ UNKNOWN WELL LOCATION
- ⊠ WATER SUPPLY WELL LOCATION

SCALE IN FEET

0 800 1600

AUGEAS

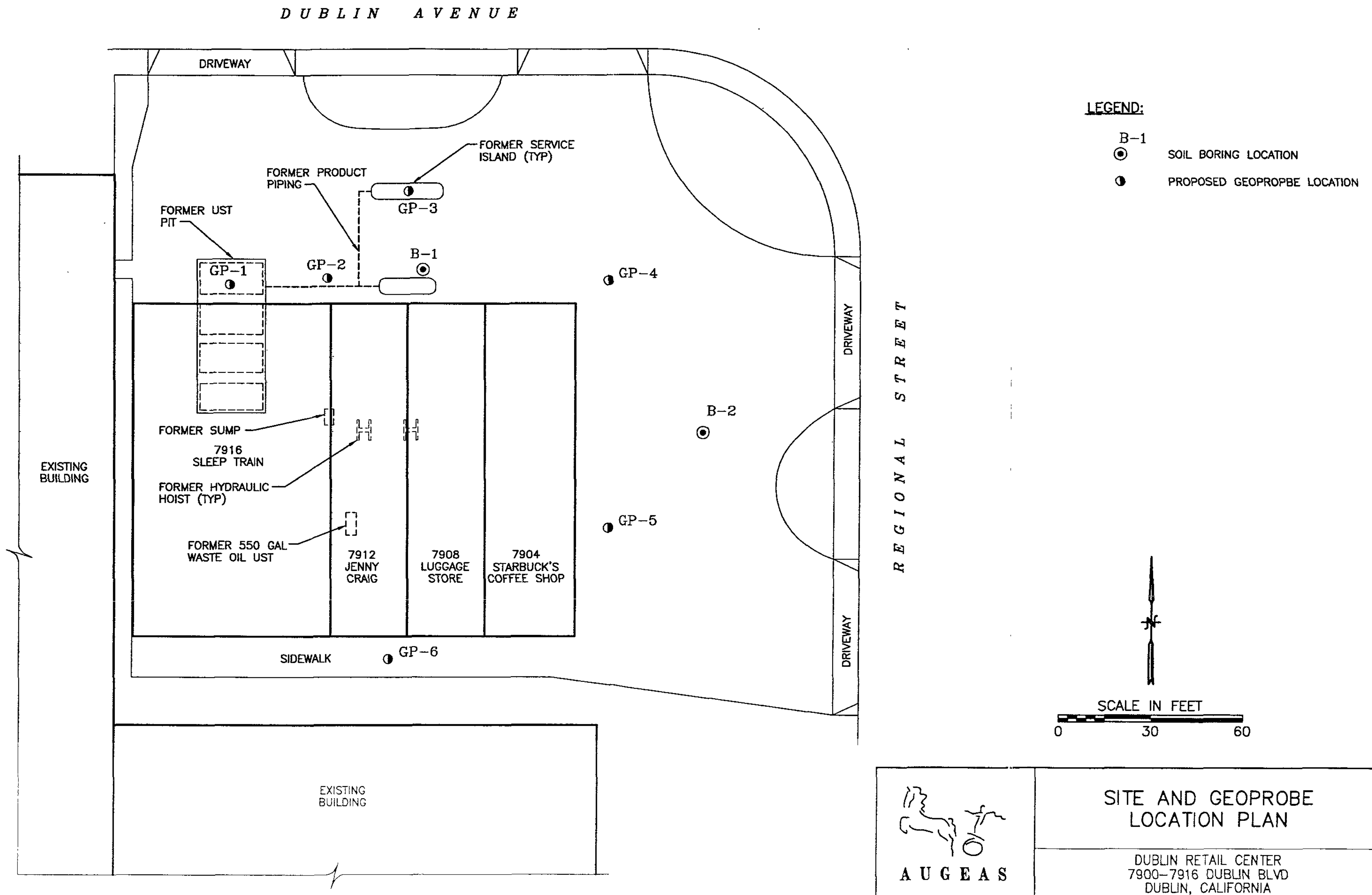
CORPORATION
HALF MOON BAY

VICINITY MAP

DUBLIN RETAIL CENTER
7900–7916 DUBLIN BLVD
DUBLIN, CALIFORNIA

2–19–02

FIGURE 1



REFERENCE:
REPRODUCED FROM ARCO
SERVICE STATION BLUEPRINT
DATED 9-4-69

20030318 10340199 \\Jan-home\c\Client Drawings\AUGEAS\7900 DUBLIN\03170301 7900.dwg

AUGEAS
CORPORATION
HALF MOON BAY

SITE AND GEOPROBE LOCATION PLAN

DUBLIN RETAIL CENTER
7900-7916 DUBLIN BLVD
DUBLIN, CALIFORNIA

3-17-03

FIGURE 2

Tables

Table 1
Historical Soil Analytical Results
Dublin Retail Center
7900-7916 Dublin Boulevard, Dublin, California

Sample ID	Sample depth (ft)	Date Collected	Total Petroleum Hydrocarbons as (mg/kg)		Aromatic Volatile Organic Compounds (mg/kg)				Oxygenated Compounds (mg/kg)								
			Gasoline	Diesel	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	DIPE	ETBE	TAME	tert-Butanol	eth-anol	meth-anol	1,2-DCA	EDB
AB-1A**	5	8/31/98	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005*	--	--	--	--	--	--	--	--
AB-1B**	10	8/31/98	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005*	--	--	--	--	--	--	--	--
AB-1C**	15	8/31/98	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005*	--	--	--	--	--	--	--	--
GP-1@4'	4	2/21/03	<1.0	1.6 g	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
GP-1@16'	16	2/21/03	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
GP-2@8'	8	2/21/03	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
GP-2@20'	20	2/21/03	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
GP-3@12'	12	2/21/03	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
GP-3@20'	20	2/21/03	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
GP-4@4'	4	2/21/03	<1.0	1.2 g	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
GP-4@16'	16	2/21/03	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
GP-5@8'	8	2/21/03	<1.0	1.9 g	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
GP-5@20'	20	2/21/03	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
GP-6@10'	10	2/21/03	<1.0	1.0 g	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
GP-6@20'	20	2/21/03	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<5.0	<5.0	<5.0	<5.0	<25	<2500	<250	<5.0	<5.0
Analytical Method			8015M		8020				8260M								

Notes:

-- = not applicable

(mg/kg) = milligrams per kilograms

MTBE = methyl tertiary butyl ether

DIPE = Di-isoprpopyl Ether

ETBE = Ethyl tert-Butyl Ether

TAME - tert-Amyl Methyl Ether

1,2-DCA = 1, 2-Dichloroethane

EDB = Ethylene dibromide

g = oil range compounds are significant

* = analyzed with EPA 8020

** = soil samples collected from boring B-1

Table 2
Historical Groundwater Analytical Results
Dublin Retail Center
7900-7916 Dublin Boulevard, Dublin, California

Sample ID	Date Collected	Total Petroleum Hydrocarbons as (µg/L)		Aromatic Volatile Organic Compounds (µg/L)				Oxygenated Compounds (µg/L)								
		Gasoline	Diesel	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	DIPE	ETBE	TAME	TBA	eth-anol	meth-anol	1,2-DCA	EDB
GW-1*	9/2/98	440 b,f	1,000 g,b	<0.5	21	<0.5	0.69	160*	--	--	--	--	--	--	--	--
GP-1-W	2/21/03	<50 i	76 i,g	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<50	<500	<0.5	<0.5
GP-2-W	2/21/03	<50 i	190 i,b,g	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	<0.5	<5.0	<50	<500	<0.5	<0.5
GP-3-W	2/21/03	<50	62 b	<0.5	<0.5	<0.5	<0.5	77	<1.0	<1.0	<1.0	<10	<100	<1000	<1.0	<1.0
GP-4-W	2/21/03	<50 i	1,200 c/m,i	<0.5	<0.5	<0.5	<0.5	74	<1.0	<1.0	<1.0	13	<100	<1000	<1.0	<1.0
GP-5-W	2/21/03	120 a,I	450 g	<0.5	<0.5	6.9	48	<0.5	<0.5	<0.5	<0.5	<5.0	<50	<500	<0.5	<0.5
GP-6-W	2/21/03	<50 i	70 i,g	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<50	<500	<0.5	<0.5
Analytical Method		8015M		8020				8260M								

Notes:

-- = not applicable
NS = Not Sampled
FPP = Free Phase Product
(µg/L) =micrograms per liter
MTBE = methyl tertiary butyl ether
DIPE = Di-isoprpopyl Ether
ETBE = Ethyl tert-Butyl Ether

TAME - tert-Amyl Methyl Ether
1,2-DCA = 1, 2-Dichloroethane
EDB = Ethylene dibromide
TBA = tert-butyl alcohol
f = one to a few isolated peaks present
g = oil range compounds are significant
c = aged diesel? Is significant

b = diesel range compounds are significant; no recognizible pattern
m = fuel oil
GW-1* = "grab" groundwater sample collected from boring B-2

Appendix A

Augeas Corporation's
Standard Operating Procedures

AUGEAS CORPORATION'S
STANDARD OPERATING PROCEDURES

Geoprobe Boring Installations and Sampling

Geoprobe soil borings are installed by pushing a clean, 2.5-inch diameter, 5-foot long, steel core barrel into undisturbed soil. The core barrel, equipped with a new, clean acetate liner, is pushed with the aid of a hydraulic hammer. The soil sample is collected in the acetate liner. The core barrel is removed from the borehole and the acetate liner is removed from the core barrel. The desired interval is immediately cut from the acetate liner, capped with Teflon® sheets and plastic caps. The sample is then labeled and placed on ice in a cooler. The core barrel is washed with an Alconox® solution and rinsed between each boring. These procedures minimize the potential for cross contamination and volatilization of volatile organic compounds (VOCs) prior to chemical analysis.

A portion of each sample is retained for field screening purposes. A small amount of soil (approximately 1 ounce) is placed in a plastic bag and placed in the sun for approximately 15 minutes. The bag is then pierced by the tip of a portable photo-ionization detector (PID) and the air in the bag is analyzed for total volatile hydrocarbons. The purpose of the field screening is to qualitatively determine the presence or absence of chemical organic compounds in order to aid in the selection of samples to be analyzed at the laboratory. The data is then recorded on the boring logs at the depth corresponding to the sampling point.

The remainder of the acetate liner is then cut open and examined for lithology according to the Unified Soil Classification System under the supervision of a California Registered Geologist. Job location, boring location, boring name, date, soil types, observations and activities are recorded on the boring logs.

Upon completion of each soil boring, the hole is filled with a cement grout and bentonite mixture from the bottom of the boring to surface grade. The purpose of grouting the hole is to prevent future surface contamination from having a conduit to the groundwater table.

Water Sampling

Once the borings are advanced to the desired depth, water samples are collected. If the boring stays open, a clean stainless steel bailer is lowered into the boring to retrieve water samples. If the boring does not stay open, a new, clean, temporary, well casing and screen will be lowered into the boring to aid in water sample collection. The water is then carefully transferred from the bailer into the sample containers. The containers are then capped, labeled and placed on ice. After the water samples are collected, the temporary well casing and screen are removed from the boring and properly disposed of.

Dual Wall Sampling System

The Dual Wall split spoon or window sheath sampler is loaded with the desired sample liner/liners and installed inside the outer casing. Simultaneously, the outer drive casing and inner split spoon sample barrel are advanced 2, 4, or 5 feet, depending on sampling system application. As these tools are advanced, the inner sampling barrel collects the soil core sample. This sampler is then retrieved while the outer casing remains in place, protecting the integrity of the hole. A new sampler is lowered into place, and advanced further to collect the next soil sample. This process continues until a desired depth has been reached. The dual wall sampling system also provides discrete depth soil and groundwater sampling. Using a locked drive point, the dual wall sampling system is advanced, displacing the soils until a desired depth has been reached.

Hollow Stem Auger Drilling

During hollow stem auger drilling, soil samples are collected in 2-inch by 6-inch long brass tubes. Three brass tubes are placed in an 18-inch long split-barrel (spoon) sampler of the appropriate inside-diameter. The split-barrel sampler is driven its entire length, either hydraulically or using a 140-pound hammer, or until refusal is encountered. The sampler is extracted from the borehole and the brass tubes are immediately trimmed and capped with Teflon® sheets and plastic caps. The samples are then sealed, labeled, and placed in chilled storage (refrigerated) for delivery, under chain of custody to the state-certified analytical laboratory. These procedures minimize the potential for cross contamination and volatilization of volatile organic compounds (VOCs) prior to chemical analysis.

One soil sample collected at each sampling interval is analyzed in the field using either a portable photo-ionization detector (PID), flame ionization detector, organic vapor analyzer, catalytic gas detector, or an explosimeter. The purpose of the field screening is to qualitatively determine the presence or absence of chemical organic compounds in order to select the samples to be analyzed at the laboratory. The soil sample is sealed in either a brass tube, glass jar, or plastic bag to allow for some volatilization of VOCs. The PID is then used to measure the relative concentrations of VOCs within the container's headspace. The data is recorded on both field notes and the boring logs at the depth corresponding to the sampling point.

Other soil samples are collected to document the soil and/or stratigraphic profile beneath the project site, and estimate the relative permeability of the subsurface materials. All drilling and sampling equipment are decontaminated prior to use; all equipment is either steam cleaned or washed in solution and rinsed twice in de-ionized water prior to use at each site and between boreholes to minimize the potential for cross-contamination.

In the event the soil samples cannot be submitted to the analytical laboratory on the same day of collection, the samples will be temporarily stored in a chilled ice cooler, or in a refrigerator at Augeas Corporation's office.

All soil borings are backfilled with a mixture of neat cement with 5% bentonite powder to surface grade.

SOIL CLASSIFICATION

Soil samples are classified according to the Unified Soil Classification System. Representative portions of the samples may be submitted under chain of custody to a state-certified analytical laboratory for further examination and verification of the in-field classification and analysis of soil mechanical and/or physical properties. The soil types are indicated on logs of either excavations or borings together with depths corresponding to the sampling points and other pertinent information.

MONITORING WELL INSTALLATION AND WELL DEVELOPMENT

1. Hollow Stem Auger Technique

Boreholes for monitoring wells are drilled using a truck-mounted, hollow-stem auger drill rig. The borehole diameter will be a minimum of 4-inches larger than to outside diameter of the casing when installing well screen. The hollow-stem auger provides minimal interruption of drilling while permitting soil sampling at desired intervals. Soil samples are collected by either hammering (with a 140-pound drop hammer) or hydraulically pushing a conventional spit-barrel sampler containing pre-cleaned 2-inch diameter brass tubes. An Augeas geologist or engineer will continuously log each borehole during drilling and will constantly check drill cuttings for indications of both the first recognizable occurrence of groundwater and volatile organic compounds using either a portable photoionization detector (PID), flame ionization detector (FID), or an explosimeter. The sampler is rinsed between samples and either steam cleaned or washed with all other drilling equipment between borings to minimize the potential for cross contamination.

Monitoring wells are cased with threaded, factory-perforated and blank Schedule 40 polyvinyl chloride (PVC). The perforated interval consists of slotted casing, generally with 0.02-inch wide by 1.5-inch long slots, with 42 slots per foot. A PVC cap may be secured to the bottom of the casing with stainless steel screws; no solvents or cements are used. Centering devices may be fastened to the casing to ensure even distribution of filter material and grout within the borehole annulus. The well casing is thoroughly washed and/or steam cleaned, or may be purchased as pre-cleaned, prior to installation.

After setting the casing inside the hollow-stem auger, sand or gravel filter material is poured into the annular space to fill from boring bottom to generally 1 foot above the perforated interval. A 1 - to 2-foot thick bentonite plug is set above this filter material to prevent grout from infiltrating the filter pack. Neat cement containing about 5 percent bentonite is then tremmied into the annular space from the top of the bentonite plug to near surface. A traffic-rated vault is installed around each wellhead for wells located in parking lots or driveways, while steel "stovepipes" are usually set over wellheads in landscaped areas.

After installation, the wells are thoroughly developed to remove residual drilling materials from the wellbore, and to improve well performance by removing fine material from the filter pack that may pass into the well. Well development techniques used may include pumping, surging, bailing, swabbing, jetting, flushing, and airlifting. All development water is collected either in drums or tanks for temporary storage, and properly disposed of pending laboratory analytical results. To minimize the potential of cross contamination between wells, all development equipment is either steam cleaned or properly washed prior to use. Following development, the well is allowed to stand undisturbed for a minimum of 24 hours before its first sampling.

GROUNDWATER PURGING AND SAMPLING

Groundwater monitoring wells will be monitored, purged, and sampled to assess groundwater flow characteristics and quality. Groundwater monitoring, purging, sampling, handling, and preservation protocols will be performed in accordance with these standard operating procedures (SOPs), as well as local county and state guidelines. Quality assurance/quality control (QA/QC) procedures will be implemented to monitor and document analytical laboratory procedures. The following sections describe the procedures for specific groundwater monitoring, sampling, and analytical activities.

SAMPLE IDENTIFICATION AND CHAIN-OF-CUSTODY PROCEDURES

Sample identification and chain-of-custody procedures ensure sample integrity as well as document sample possession from time of collection to ultimate disposal. Each sample container submitted for analysis is labeled to identify the job number, date, time of sample collection, a sample number unique to the sample, any in-field measurements made, sampling methodology, name(s) of on-site personnel, and any other pertinent field observations also recorded on the field excavation or boring log.

Chain-of-custody forms are used to record possession of the sample from time of collection to arrival at the laboratory. During shipment, the person with custody or the samples will relinquish them to the next person by signing the chain-of-custody form(s) and noting the date and time. The sample control officer at the laboratory will verity sample integrity, correct preservation, confirm collection in the proper container(s), and ensure adequate volume for analysis.

When these conditions are met, the samples will be assigned unique laboratory log number(s) for identification throughout analysis and reporting. The log numbers will be recorded on the chain-of-custody forms and in the legally-required log book maintained in the laboratory. The sample description, date received, clients name, and fly other relevant information will also be recorded.

Sample Handling and Labeling

To avoid any possible chemical or physical change in a sample during collection and transport, the sample containers will consist of non-reactive materials and be lab-certified clean prior to sampling activities. Sample containers to be used for laboratory analysis will consist of 40-milliliter (ml) glass vials and/or 1-liter amber bottles depending upon requested chemical analysis. Samples will be collected until each container is completely full in order to maintain anaerobic conditions. Samples collected for analysis will be carefully placed into the 40-ml glass vials having Teflon®® septum lids. The liter bottles will be filled to prevent any air bubbles from being present in each vial after sealing the septum lid. Confirmation of the lack of air bubbles will be verified by inverting each vial.

Sample bottles will be labeled with the project name (site location), well number, time and date of sampling, and sampler's initials. All samples will be immediately placed into an insulated chilled ice cooler for temporary storage and transport to the laboratory. The ice chests will contain sufficient packing material which will protect the integrity of the samples for transportation. Samples will be handled in accordance with appropriate chain-of-custody procedures, as discussed herein.

Sample Preservation and Acidification

Sample preservation will be utilized in order to retard the physical and chemical alternations of unstable constituents within the sample medium. Sample preservation methods are limited and are generally intended to perform the following functions:

- Retard biological action;
- Retard hydrolysis of chemical compounds and complexes;
- Reduce volatility of constituents;
- Reduce absorption effects.

Preservation is usually limited to pH control, chemical addition, filtration, refrigeration, and freezing.

The glass vials and bottles used for the collection of groundwater samples for laboratory analyses will be acidified by the analytical laboratory prior to shipment of the sample bottles to the site. The glass vials will typically contain hydrochloric acid (HCL) for aromatic volatile organic compounds, or other preservative depending on contaminant, to act as a bacterial inhibitor for the chemical compound analyzed. Problems associated with sample preservation will be documented, as appropriate.

Temperature Control

Groundwater samples submitted for laboratory analyses will be sealed in proper sample containers, and then temporarily stored in an insulated ice chest containing crushed ice for transport to the analytical laboratory. Placement of the groundwater samples into a chilled ice chest inhibits bacterial growth in the samples and also slows the chemical and biological changes of a sample exposed to an oxidizing atmosphere. A thermometer indicating maximum temperature variances will be inserted into the ice chest(s) for documentation purposes during inspection at the time of delivery at the analytical laboratory.

Chain-of-Custody Documentation

Chain-of-custody (COC) procedures will be implemented for documenting and tracking the handling of soil and/or groundwater samples. The term "chain of custody" refers to a procedure of written documentation of sample acquisition, handling, and shipping of all samples potentially intended for enforcement or legal purposes. COC documents will include the following information:

- Company name and address;
- Project name and address;
- Name of project manager;
- Laboratory name;
- Name of sampler(s);
- Sample identification number, location, matrix, and type and number of sample container(s);
- Date and time of sample collection; and
- Required analysis and turnaround/reporting time

Field sampling personnel will visually inspect the groundwater samples to ensure that the samples are correctly labeled and that the sample integrity is maintained with no apparent leakage or incorrect packaging. Field sampling personnel will complete and sign the COC prior to sample transfer. The COC will accompany the samples to the analytical laboratory. This form will be placed inside a sealed, plastic bag and packed into the ice chest.

Whenever the samples are transferred from one party to another, both parties will sign the COC and record the date and time of transfer. COC records will be signed and completed between both parties prior to the sample shipment off-site to the designated state-certified analytical laboratory. After the samples are submitted to the laboratory, they will be assigned unique laboratory log numbers for identification throughout analysis and reporting. The log numbers will be recorded on the chain-of-custody forms and in a logbook maintained by the laboratory. The sample description, date received, name of client, and other relevant information will also be recorded.

After the samples are analyzed, a copy of each completed form will accompany the data transmittal from the analytical laboratory. Completed COC forms will be reviewed by Augeas prior to insertion into the project files/reports.

Laboratory Coordination

The analytical laboratory will be contacted at least 48 hours prior to receipt of the samples. Following drop-off or shipment of the samples, a sample custodian at the laboratory will accept the samples and verify the receipt of the samples on the accompanying COC forms. The samples will be tracked on a laboratory sample custody log consisting of serially numbered, standard laboratory tracking report sheets. At least 24 hours after sample shipment, the laboratory will then be contacted to verify receipt of the samples and the estimated turnaround time for analysis. However, this final step may not be necessary if the samples are picked up by a courier from the laboratory, or the samples are delivered directly to the laboratory by the sampler. In the event the water samples cannot be submitted to the analytical laboratory on the same day of collection (i.e. due to weekends or holidays), the samples will be temporarily stored in either a chilled ice cooler or in a refrigerator at Augeas Corporation's office until the first opportunity for submittal to the laboratory.

Laboratory Analytical Quality Assurance/Quality Control (QA/QC)

In addition to routine instrument calibration, replicates, spikes, blanks, spiked blanks, and certified reference materials are routinely analyzed at method-specific frequencies to monitor precision and bias.
Additional components of the laboratory QA/QC program included the following:

- Participation in state and federal laboratory accreditation/certification programs;
- Participation in both U.S. EPA Performance Evaluation studies and inter-laboratory performance evaluation programs;
- Standard operating procedures describing routine and periodic instrument maintenance; and
- Multi-level review of raw laboratory and client reports.

Decontamination and Waste Containerization

Various types of bailers will be used to purge monitoring wells and to obtain groundwater samples. Purging equipment will be decontaminated prior to use at each monitoring well. Groundwater samples will be obtained using the portable, dedicated sample bailers. Equipment used for water quality monitoring will also be decontaminated, where necessary and practical. Decontamination procedures on water quality monitoring equipment will be dependent upon equipment manufacturers' instructions and specifications. Decontamination procedures will take place at a pre-designated on-site location. Decontamination procedures will be recorded in the field logbook.

Decontamination procedures of the well purging equipment will be accomplished by rinsing the equipment in Liquinox® and water solution, followed by a triple rinse using de-ionized water. De-ionized water will be used for each rinse of the equipment. Rinsing of the equipment will take place with the use of 5-gallon buckets, that will placed on top of plastic sheeting laid along the ground surface in the pre-designated on-site decontamination location.

Water generated during well purging will be placed into DOT-approved 55-gallon waste drums. Excess water generated during groundwater sampling will also be placed into these waste drums. Waste drums containing the purge water and any excess water will be sealed and labeled, and then moved to a temporary centralized storage area, as designated by the manager of the site facilities. The drums will be labeled with the project name (site location), date of generation, well number, and type of matrix (i.e., purged groundwater). Arrangements for transport and disposal of the water will be made upon receipt of the analytical results. The water will be transported and disposed at an approved transport, storage, and disposal (TSD) facility. Health and safety equipment, such as Tyvek suits and nitrile gloves, worn during monitoring will also be placed into a 55-gallon waste drum at each facility.

Appendix B

Drilling Permit

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588-5127 VOICE (925) 484-2600 X235 FAX (925) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 7900 DUBLIN BLVD.
DUBLIN, CA

California Coordinates Source ______ Accuracy± ______ ft.
CCN ______ ft CCE ______ ft.
APN 941-1500-17-6

CLIENT
Name ALLAN SEBANC
Address 10 STACEY CT. Phone ______
City HILLSBOROUGH, CA Zip 94010

APPLICANT
Name AUGEAS CORPORATION
Fax (831) 425-8006
Address P.O. BOX 1541 Phone (831) 425-8007
City SANTA CRUZ, CA Zip 95061

TYPE OF PROJECT:
Well Construction
Well Destruction
Cathodic Protection
Geotechnical Investigation
[✓ Contamination Investigation]
Other ______

PROPOSED WELL USE:
Domestic
Municipal
Industrial
Dewatering
Irrigation
Remediation
Groundwater Monitoring
Other ______

DRILLING METHOD:
Mud Rotary
Cable Tool
Air Rotary
[✓ Direct Push]
Hollow Stem Auger
Other ______

DRILLING COMPANY ENVIRONMENTAL CONTROL ASSOCIATES, INC.
DRILLER'S LICENSE NO. C57 695970

WELL SPECIFICATIONS:
Drill Hole Diameter ______ in Maximum
Casing Diameter ______ in Depth ______ ft.
Surface Seal Depth ______ ft Number ______

SOIL BORINGS:
Number of Borings 6 Maximum
Hole Diameter 2.5 in. Depth 30 ft

ESTIMATED STARTING DATE 2/20/03
ESTIMATED COMPLETION DATE 2/20/03

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE ______ Date 2/7/03

ATTACH SITE PLAN OR SKETCH

FOR OFFICE USE

PERMIT NUMBER ______
WELL NUMBER ______
APN ______

PERMIT CONDITIONS

Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
1. Minimum surface seal diameter is four inches greater than the well casing diameter.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.
3. Grout placed by tremie.
4. An access port at least 0.5 inches in diameter is required on the wellhead for water level measurements
5. A sample port is required on the discharge pipe near the wellhead

C GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal diameter is four inches greater than the well or piezometer casing diameter.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.
3 Grout placed by tremie.

D GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings

E. CATHODIC Fill hole above anode zone with concrete placed by tremie.

F. WELL DESTRUCTION. See attached.

G. SPECIAL CONDITIONS:, Submit to Zone 7 within 60 days after completion of permitted work the well installation report **including all soil and water laboratory analysis results**.

Approved ______ Date ______
Wyman Hong

P:\WRE\WYMAN\drilling permit.wpd

Revised: March 26, 2002

Appendix C

Unified Soil Classification System, Soil Boring Logs

Project: 7900 Dublin Ave., Dublin, CA		**Boring I.D.: GP-1**	**Page: 1 of 1**
Drilling Agency: ECA	Drilling Method: Geoprobe	Date Started: 2/21/03	Date Finished: 2/21/03
Logged By: JM	Samples: 6	Completion Depth: 24'	Initial Water Depth: 19.85'

Depth (feet)	**Lithologic Description/Remarks**	PID/(PPM)	Soil Class'n	Depth (feet)	Blows/ft.	Sample Interval / Sample Number	**Well Construction**
	Asphalt - 2-3" of asphalt at surface						
2	SW - Gravelly sand, light to medium brown, damp, FeO3, NPO, 20-30% fine to coarse gravel, 65-75% fine to coarse sand, 5-10% silt		SW	2			
	CL - Silty clay, medium brown, damp to moist, medium plasticity, Fe03, NPO, 0-10% fine sand, 25-35% silt, 65-75% clay		CL				
4				4		GP-1@4'	
6	SW - Gravelly sand, same as at 3" bgs		SW	6			
	CL - Silty clay, same as at 1.5' bgs		CL				
	SW - Gravelly sand, same as at 5'5 bgs		SW				
8	CL - Silty clay w/ some gravel, light to medium brown, moist, low to medium plasticity, Fe03, NPO, 5-15% fine gravel, 0-10% fine to coarse sand, 15-25% silt, 60-70% clay		CL	8		GP-1@8'	
10				10			
	CH - Clay w/ some silt, light to medium brown, moist, medium to high plasticity, NPO, 0-10% fine sand, 5-15% silt, 80-90% clay		CH				
12				12		GP-1@12'	
	SW - Gravelly sand, same as at 7'bgs, moist		SW				
14				14			
	CH - Clay w/ some silt, same as at 9.5'bgs		CH				
16				16		GP-1@16'	
	SW - Gravelly sand, same as at 13'bgs		SW				
18				18			
	CL - Silty clay w/some gravel, same as at 7.5'bgs, very moist		CL				
20				20	▼	GP-1@20'	
	SW - Gravelly sand, same as at 17'bgs, very moist		SW				
22	CL - Silty clay, same as at 6'bgs, saturated		CL	22			
	CH - Clay, medium brown, saturated, high plasticity, NPO, 5-15% silt, 85-95% clay		CH			GP-1@24'	
24	Total depth = 24 feet bgs			24			
26				26			
28				28			
30				30			

Augeas Corporation	Site Address: 7900 Dublin Ave., Dublin, CA

Project: 7900 Dublin Ave., Dublin, CA		**Boring I.D.: GP-2**	**Page: 1 of 1**
Drilling Agency: ECA	Drilling Method: Geoprobe	Date Started: 2/21/03	Date Finished: 2/21/03
Logged By: JM	Samples: 6	Completion Depth: 24'	Initial Water Depth: 19.85'

Depth (feet)	**Lithologic Description/Remarks**	PID/(PPM)	Soil Class'n	Depth (feet)	Blows/ft.	Sample Interval	Sample Number	**Well Construction**
	Asphalt - 2-3" of asphalt at surface					▨		
2	SW - Gravelly sand, light to medium brown, damp, FeO3, NPO, 20-30% fine to coarse gravel, 65-75% fine to coarse sand, 5-10% silt		SW	2		▨		
4	CL - Silty clay w/ some gravel, light to medium brown, damp, low to medium plasticity, Fe03, NPO, 5-15% fine gravel, 0-10% fine to coarse sand, 15-25% silt, 60-70% clay		CL	4		▨	GP-2@4'	
6	SW - Gravelly sand, same as at 3"bgs		SW	6		▨		
8	CL - Silty clay w/ some gravel, same as at 1.5' bgs, moist		CL	8		▨	GP-2@8'	
	SW - Gravelly sand, same as at 5.5'bgs, damp to moist		SW			▨		
10	CL - Silty clay w/ some gravel, same as at 6'		CL	10		▨		
12	CH - Clay w/ some silt, light to medium brown, moist, medium to high plasticity, NPO, 0-10% fine sand, 5-15% silt, 80-90% clay		CH	12		▨	GP-2@12'	
14				14		▨		
16	CL - Silty clay, medium brown, moist, medium plasticity, Fe03, NPO, 0-10% fine sand, 25-35% silt, 65-75% clay		CL	16		▨	GP-2@16'	
18	SW - Gravelly sand, same as at 8.5'bgs, moist		SW	18		▨		
20	CL - Silty clay, same as at 13'bgs, very moist, grey mottling		CL	20	▼	▨	GP-2@20'	
22				22		▨		
24	CH - Clay, medium brown, saturated, high plasticity, NPO, 5-15% silt, 85-95% clay		CH	24		▨	GP-2@24'	
	Total depth = 24 feet bgs							
26				26				
28				28				
30				30				

Augeas Corporation	Site Address: 7900 Dublin Ave., Dublin, CA

Project: 7900 Dublin Ave., Dublin, CA		**Boring I.D.: GP-3**	**Page: 1 of 1**
Drilling Agency: ECA	Drilling Method: Geoprobe	Date Started: 2/21/03	Date Finished: 2/21/03
Logged By: JM	Samples: 6	Completion Depth: 24'	Initial Water Depth: 19.72'

Depth (feet)	**Lithologic Description/Remarks**	PID/(PPM)	Soil Class'n	Depth (feet)	Blows/ft.	Sample Interval	Sample Number	**Well Construction**
	Asphalt - 2-3" of asphalt at surface					▨		
2	SW - Gravelly sand, light to medium brown, damp, FeO3, NPO, 20-30% fine to coarse gravel, 65-75% fine to coarse sand, 5-10% silt		SW	2		▨		
4	ML - Clayey silt, medium to dark brown, damp, low plasticity, Fe03, NPO, 5-15% fine sand, 20-30% silt, 65-75% clay		ML	4		▨	GP-3@4'	
6				6		▨		
	ML - Clayey silt, same as above, w/ some gravel		ML			▨		
8				8		▨	GP-3@8'	
	SW - Gravelly sand, same as at 3"bgs		SW			▨		
	ML - Clayey silt, same as at 2'bgs		ML			▨		
10				10		▨		
12	CL - Silty clay, light to medium brown, moist, medium plasticity, Fe03, NPO, 0-10% fine sand, 25-35% silt, 65-75% clay		CL	12		▨	GP-3@12'	
14				14		▨		
	CH - Clay w/ some silt, light to medium brown, moist, medium to high plasticity, NPO, 0-10% fine sand, 5-15% silt, 80-90% clay		CH			▨		
16				16		▨	GP-3@16'	
	SW - Gravelly sand, same as at 8.5'bgs, moist		SW			▨		
18				18		▨		
20	CL - Silty clay w/ some gravel, medium grey, very moist, low to medium plasticity, Fe03, NPO, 5-15% fine gravel, 0-10% fine to coarse sand, 15-25% silt, 60-70% clay		CL	20	▼	▨	GP-3@20'	
22				22		▨		
	CH - Clay, medium brown, grey mottling, saturated, medium plasticity, NPO, 5-15% silt, 85-95% clay		CH			▨	GP-3@24'	
24	Total depth = 24 feet bgs			24				
26				26				
28				28				
30				30				

Augeas Corporation	Site Address: 7900 Dublin Ave., Dublin, CA

Project: 7900 Dublin Ave., Dublin, CA		**Boring I.D.: GP-4**	**Page: 1 of 1**
Drilling Agency: ECA	Drilling Method: Geoprobe	Date Started: 2/21/03	Date Finished: 2/21/03
Logged By: JM	Samples: 6	Completion Depth: 24'	Initial Water Depth: 19.85'

Depth (feet)	**Lithologic Description/Remarks**	PID/(PPM)	Soil Class'n	Depth (feet)	Blows/ft.	Sample Interval	Sample Number	**Well Construction**
	Asphalt - 2-3" of asphalt at surface					▓		
2	SW - Gravelly sand, light to medium brown, damp, FeO3, NPO, 20-30% fine to coarse gravel, 65-75% fine to coarse sand, 5-10% silt		SW	2		▓		
4	ML - Clayey silt, medium to dark brown, damp, low plasticity, Fe03, NPO, 5-15% fine sand, 20-30% silt, 65-75% clay		ML	4		▓	GP-4@4'	
6				6		▓		
	ML - Clayey silt, same as above, moist		ML			▓		
8				8		▓	GP-4@8'	
10				10		▓		
12	CL - Silty clay, light to medium brown, moist, low to medium plasticity, Fe03, NPO, 0-10% fine sand, 25-35% silt, 65-75% clay		CL	12		▓	GP-4@12'	
14				14		▓		
	CH - Clay, w/ some silt, light to medium brown, moist, medium to high plasticity, NPO, 0-10% fine sand, 5-15% silt, 80-90% clay		CH			▓		
16				16		▓	GP-4@16'	
	CL - Silty clay, same as at 9'bgs, moist to very moist		CL			▓		
18	SW - Gravelly sand, same as at 3"bgs, moist to very moist		SW	18		▓		
20	ML - Clayey silt, same as at 2'bgs, w/some gravel, very moist		ML	20	▼	▓	GP-4@20'	
22	CL - Silty clay, same as at 16'bgs, grey mottling, saturated		CL	22		▓		
24	Total depth = 24 feet bgs			24			GP-4@24'	
26				26				
28				28				
30				30				

Augeas Corporation	Site Address: 7900 Dublin Ave., Dublin, CA

Project: 7900 Dublin Ave., Dublin, CA		**Boring I.D.: GP-5**	**Page: 1 of 1**
Drilling Agency: ECA	Drilling Method: Geoprobe	Date Started: 2/21/03	Date Finished: 2/21/03
Logged By: JM	Samples: 6	Completion Depth: 24'	Initial Water Depth: 19.85'

Depth (feet)	**Lithologic Description/Remarks**	PID/(PPM)	Soil Class'n	Depth (feet)	Blows/ft.	Sample Interval	Sample Number	**Well Construction**
	Asphalt - 2-3" of asphalt at surface					▨		
	SW - Gravelly sand, light to medium brown, damp, FeO3, NPO, 20-30% fine to coarse gravel, 65-75% fine to coarse sand, 5-10% silt		SW			▨		
2	ML - Clayey silt, medium to dark brown, damp, low plasticity, Fe03, NPO, 5-15% fine sand, 20-30% silt, 65-75% clay		ML	2		▨		
4	CL - Silty clay w/ some gravel, light to medium brown, damp to moist, low to medium plasticity, Fe03, NPO, 5-15% fine gravel, 0-10% fine to coarse sand, 15-25% silt, 60-70% clay		CL	4		▨	GP-5@4'	
6	SW - Gravelly sand, same as at 3"bgs		SW	6		▨		
8	CL - Silty clay w/ some gravel, same as at 4'bgs		CL	8		▨	GP-5@8'	
10				10		▨		
12	CL - Silty clay w/ some gravel, same as above, moist, NPO		CL	12		▨	GP-5@12'	
14				14		▨		
16	CH - Clay w/ some silt, light to medium brown, moist, medium to high plasticity, carbonized wood, NPO, 0-10% fine sand, 5-15% silt, 80-90% clay		CH	16		▨	GP-5@16'	
18	CL - Silty clay w/ some gravel, light to medium brown, moist to very moist, low to medium plasticity, Fe03, NPO, 5-15% fine gravel, 0-10% fine to coarse sand, 15-25% silt, 60-70% clay		CL	18		▨		
20	ML - Clayey silt, same as at 1.5'bgs, w/ some gravel, very moist		ML	20	▼	▨	GP-5@20'	
22	CL - Silty clay w/ some gravel, same as at 16.5'bgs, saturated		CL	22		▨	GP-5@24'	
24	Total depth = 24 feet bgs			24				
26				26				
28				28				
30				30				

Augeas Corporation Site Address: 7900 Dublin Ave., Dublin, CA

Project: 7900 Dublin Ave., Dublin, CA		**Boring I.D.: GP-6**	**Page: 1 of 1**
Drilling Agency: ECA	Drilling Method: Geoprobe	Date Started: 2/21/03	Date Finished: 2/21/03
Logged By: JM	Samples: 5	Completion Depth: 25'	Initial Water Depth: 19.85'

Depth (feet)	**Lithologic Description/Remarks**	PID/(PPM)	Soil Class'n	Depth (feet)	Blows/ft.	Sample Interval / Sample Number	**Well Construction**
0	Concrete - 3-4" of concrete at surface						
2				2			
4	CL - Silty clay w/ some gravel, light to medium brown, moist, low to medium plasticity, Fe03, NPO, 5-15% fine gravel, 0-10% fine to coarse sand, 15-25% silt, 60-70% clay		CL	4		GP-6@5'	
6				6			
8				8			
10	CL - Silty clay, same as above		CL	10		GP-6@10'	
12				12			
14	CH - Clay w/ some silt, light to medium brown, moist, medium to high plasticity, NPO, 0-10% fine sand, 5-15% silt, 80-90% clay		CH	14		GP-6@15'	
16				16			
18				18			
20	CH - Clay w/ some silt, same as above, very moist		CH	20	▼	GP-6@20'	
22	CL - Silty clay, medium brown, damp to moist, medium plasticity, Fe03, NPO, 0-10% fine sand, 25-35% silt, 65-75% clay		CL	22			
24				24		GP-6@25'	
25	Total depth = 25 feet bgs						
26				26			
28				28			
30				30			

Augeas Corporation	Site Address: 7900 Dublin Ave., Dublin, CA

Appendix D

Soil Certified Analytical Reports and Chain of Custody

McCampbell Analytical Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

Augeas Corporation P.O. Box 940 Half Moon Bay, CA 94019	Client Project ID: 7900 Dublin Blvd.	Date Sampled:	02/21/03
		Date Received:	02/24/03
	Client Contact: Joe Manbine	Date Extracted:	02/24/03
	Client P.O.:	Date Analyzed:	02/25/03-02/27/03

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B | Analytical methods: SW8021B/8015Cm | Work Order: 0302305

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	GP-1@4'	S	ND	---	ND	ND	ND	ND	1	98.7
004A	GP-1@16'	S	ND	---	ND	ND	ND	ND	1	100
008A	GP-2@8'	S	ND	---	ND	ND	ND	ND	1	101
011A	GP-2@20'	S	ND	---	ND	ND	ND	ND	1	101
015A	GP-3@12'	S	ND	---	ND	ND	ND	ND	1	101
017A	GP-3@20'	S	ND	---	ND	ND	ND	ND	1	101
019A	GP-4@4'	S	ND	---	ND	ND	ND	ND	1	99.4
022A	GP-4@16'	S	ND	---	ND	ND	ND	ND	1	102
026A	GP-5@8'	S	ND	---	ND	ND	ND	ND	1	99.5
029A	GP-5@20'	S	ND	---	ND	ND	ND	ND	1	100
032A	GP-6@10'	S	ND	---	ND	ND	ND	ND	1	101
034A	GP-6@20'	S	ND	---	ND	ND	ND	ND	1	109
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	NA	NA	NA	NA	NA	NA	1	ug/L
		S	1.0	0.05	0.005	0.005	0.005	0.005	1	mg/Kg

*water and vapor samples are reported in µg/L, soil and sludge samples in mg/kg, wipe samples in µg/wipe, and TCLP extracts in µg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.

DHS Certification No. 1644

_______Angela Rydelius, Lab Manager

Augeas Corporation P.O. Box 940 Half Moon Bay, CA 94019	Client Project ID: 7900 Dublin Blvd.	Date Sampled: 02/21/03 Date Received: 02/24/03
	Client Contact: Joe Manbine	Date Extracted: 02/24/03
	Client P.O.:	Date Analyzed: 02/24/03-02/28/03

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel*

Extraction method: SW3550C
Analytical methods: SW8015C
Work Order: 0302305

Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0302305-001A	GP-1@4'	S	1.6,g	1	90.3
0302305-004A	GP-1@16'	S	ND	1	101
0302305-008A	GP-2@8'	S	ND	1	101
0302305-011A	GP-2@20'	S	ND	1	101
0302305-015A	GP-3@12'	S	ND	1	102
0302305-017A	GP-3@20'	S	ND	1	101
0302305-019A	GP-4@4'	S	1.2,g	1	88.0
0302305-022A	GP-4@16'	S	ND	1	102
0302305-026A	GP-5@8'	S	1.9,g	1	86.0
0302305-029A	GP-5@20'	S	ND	1	102
0302305-032A	GP-6@10'	S	1.0,g	1	101
0302305-034A	GP-6@20'	S	ND	1	102

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	NA	NA
	S	1.0	mg/Kg

* water and vapor samples are reported in µg/L, wipe samples in ug/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all TCLP / STLC / SPLP extracts in µg/L

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent / mineral spirit.

DHS Certification No. 1644

______Angela Rydelius, Lab Manager

Augeas Corporation P.O. Box 940 Half Moon Bay, CA 94019	Client Project ID: 7900 Dublin Blvd.	Date Sampled: 02/21/03
		Date Received: 02/24/03
	Client Contact: Joe Manbine	Date Extracted: 02/24/03
	Client P.O.:	Date Analyzed: 02/26/03-02/27/03

Oxygenated Volatile Organics by P&T and GC/MS*

Extraction Method: SW5030B Analytical Method: SW8260B Work Order: 0302305

Lab ID	0302305-001A	0302305-004A	0302305-008A	0302305-011A	Reporting Limit for DF =1	
Client ID	GP-1@4'	GP-1@16'	GP-2@8'	GP-2@20'		
Matrix	S	S	S	S		
DF	1	1	1	1	S	W
Compound	**Concentration**				µg/Kg	ug/L
Diisopropyl ether (DIPE)	ND	ND	ND	ND	5.0	NA
Ethyl tert-butyl ether (ETBE)	ND	ND	ND	ND	5.0	NA
Methyl-t-butyl ether (MTBE)	ND	ND	ND	ND	5.0	NA
tert-Amyl methyl ether (TAME)	ND	ND	ND	ND	5.0	NA
t-Butyl alcohol (TBA)	ND	ND	ND	ND	25	NA
Methanol	ND	ND	ND	ND	2500	NA
Ethanol	ND	ND	ND	ND	250	NA
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	5.0	NA
1,2-Dichloroethane (1,2-DCA)	ND	ND	ND	ND	5.0	NA
Surrogate Recoveries (%)						
%SS:	94.8	97.2	94.4	94.3		
Comments						

* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in µg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) sample diluted due to high organic content.

DHS Certification No. 1644

______Angela Rydelius, Lab Manager

Augeas Corporation P.O. Box 940 Half Moon Bay, CA 94019	Client Project ID: 7900 Dublin Blvd.	Date Sampled: 02/21/03 Date Received: 02/24/03
	Client Contact: Joe Manbine	Date Extracted: 02/24/03
	Client P.O.:	Date Analyzed: 02/26/03-02/27/03

Oxygenated Volatile Organics by P&T and GC/MS*

Extraction Method: SW5030B | Analytical Method: SW8260B | Work Order: 0302305

Lab ID	0302305-015A	0302305-017A	0302305-019A	0302305-022A	Reporting Limit for DF =1	
Client ID	GP-3@12'	GP-3@20'	GP-4@4'	GP-4@16'		
Matrix	S	S	S	S		
DF	1	1	1	1	S	W
Compound	**Concentration**				µg/Kg	ug/L
Diisopropyl ether (DIPE)	ND	ND	ND	ND	5.0	NA
Ethyl tert-butyl ether (ETBE)	ND	ND	ND	ND	5.0	NA
Methyl-t-butyl ether (MTBE)	ND	ND	ND	ND	5.0	NA
tert-Amyl methyl ether (TAME)	ND	ND	ND	ND	5.0	NA
t-Butyl alcohol (TBA)	ND	ND	ND	ND	25	NA
Methanol	ND	ND	ND	ND	2500	NA
Ethanol	ND	ND	ND	ND	250	NA
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	5.0	NA
1,2-Dichloroethane (1,2-DCA)	ND	ND	ND	ND	5.0	NA
Surrogate Recoveries (%)						
%SS:	91.6	91.0	89.0	91.7		
Comments						

* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in µg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) sample diluted due to high organic content.

Augeas Corporation P.O. Box 940 Half Moon Bay, CA 94019	Client Project ID: 7900 Dublin Blvd.	Date Sampled: 02/21/03
		Date Received: 02/24/03
	Client Contact: Joe Manbine	Date Extracted: 02/24/03
	Client P.O.:	Date Analyzed: 02/26/03-02/27/03

Oxygenated Volatile Organics by P&T and GC/MS*

Extraction Method: SW5030B Analytical Method: SW8260B Work Order: 0302305

Lab ID	0302305-026A	0302305-029A	0302305-032A	0302305-034A	Reporting Limit for DF =1	
Client ID	GP-5@8'	GP-5@20'	GP-6@10'	GP-6@20'		
Matrix	S	S	S	S		
DF	1	1	1	1	S	W
Compound	**Concentration**				μg/Kg	ug/L
Diisopropyl ether (DIPE)	ND	ND	ND	ND	5.0	NA
Ethyl tert-butyl ether (ETBE)	ND	ND	ND	ND	5.0	NA
Methyl-t-butyl ether (MTBE)	ND	ND	ND	ND	5.0	NA
tert-Amyl methyl ether (TAME)	ND	ND	ND	ND	5.0	NA
t-Butyl alcohol (TBA)	ND	ND	ND	ND	25	NA
Methanol	ND	ND	ND	ND	2500	NA
Ethanol	ND	ND	ND	ND	250	NA
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	5.0	NA
1,2-Dichloroethane (1,2-DCA)	ND	ND	ND	ND	5.0	NA
Surrogate Recoveries (%)						
%SS:	89.3	91.5	119	114		
Comments						

* water and vapor samples and all TCLP & SPLP extracts are reported in μg/L, soil/sludge/solid samples in μg/kg, wipe samples in μg/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) sample diluted due to high organic content.

DHS Certification No. 1644

______Angela Rydelius, Lab Manager

QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: S WorkOrder: 0302305

EPA Method: SW8021B/8015Cm Extraction: SW5030B BatchID: 5980 Spiked Sample ID: N/A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(gas)	N/A	0.60	N/A	N/A	N/A	106	101	5.29	80	120
MTBE	N/A	0.10	N/A	N/A	N/A	85.5	81.1	5.17	80	120
Benzene	N/A	0.10	N/A	N/A	N/A	95.9	94	2.03	80	120
Toluene	N/A	0.10	N/A	N/A	N/A	98	96.5	1.50	80	120
Ethylbenzene	N/A	0.10	N/A	N/A	N/A	97.8	96.2	1.60	80	120
Xylenes	N/A	0.30	N/A	N/A	N/A	103	100	3.28	80	120
%SS:	N/A	100	N/A	N/A	N/A	88.2	88.4	0.204	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.
NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

QC SUMMARY REPORT FOR SW8015C

Matrix: S

WorkOrder: 0302305

EPA Method: SW8015C   Extraction: SW3550C   BatchID: 5981   Spiked Sample ID: 0302305-022A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(d)	ND	150	103	101	1.40	95.4	95.1	0.242	70	130
%SS:	102	100	106	104	1.29	93.5	93	0.564	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.
NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

QC SUMMARY REPORT FOR SW8260B

Matrix: S WorkOrder: 0302305

EPA Method: SW8260B Extraction: SW5030B BatchID: 5877 Spiked Sample ID: 0302128-001A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/Kg	µg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
Diisopropyl ether (DIPE)	ND	50	89.7	89	0.786	88.8	89.9	1.21	70	130
Ethyl tert-butyl ether (ETBE)	ND	50	79.9	79.9	0.0501	82	83	1.24	70	130
Methyl-t-butyl ether (MTBE)	ND	50	82.8	83.4	0.796	87.2	88	0.865	70	130
tert-Amyl methyl ether (TAME)	ND	50	79	79.9	1.15	82.5	82.3	0.242	70	130
Methanol	ND	12500	97.4	104	6.30	94.8	95.4	0.698	70	130
Ethanol	ND	2500	112	116	3.97	115	107	6.96	70	130
1,2-Dibromoethane (EDB)	ND	50	93.2	92.4	0.886	95	97.9	3.02	70	130
1,2-Dichloroethane (1,2-DCA)	ND	50	98	98	0.0359	97.9	100	2.20	70	130
%SS:	93.4	100	82	80.7	1.60	91.7	90.6	1.24	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

Appendix E

Groundwater Certified Analytical Reports and Chain of Custody

Augeas Corporation P.O. Box 940 Half Moon Bay, CA 94019	Client Project ID: 7900 Dublin Blvd.	Date Sampled: 02/21/03 Date Received: 02/24/03
	Client Contact: Joe Mandine	Date Extracted: 02/25/03-02/26/03
	Client P.O.:	Date Analyzed: 02/25/03-02/26/03

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B
Analytical methods: SW8021B/8015Cm
Work Order: 0302308

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	GP-1-W	W	ND,i	---	ND	ND	ND	ND	1	92.0
002A	GP-2-W	W	ND,i	---	ND	ND	ND	ND	1	88.0
003A	GP-3-W	W	ND	---	ND	ND	ND	ND	1	87 6
004A	GP-4-W	W	ND,i	---	ND	ND	ND	ND	1	89.8
005A	GP-5-W	W	120,a,i	---	ND	ND	6.9	48	1	88.0
006A	GP-6-W	W	ND,i	---	ND	ND	ND	ND	1	92.7

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	5.0	0.5	0.5	0.5	0.5	1	µg/L
	S	NA	NA	NA	NA	NA	NA	1	mg/Kg

*water and vapor samples are reported in µg/L, soil and sludge samples in mg/kg, wipe samples in µg/wipe, and TCLP extracts in µg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present, i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.

DHS Certification No. 1644

_______Angela Rydelius, Lab Manager

McCampbell Analytical Inc.	110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone : 925-798-1620 Fax : 925-798-1622 http://www.mccampbell.com E-mail: main@mccampbell.com

Augeas Corporation P.O. Box 940 Half Moon Bay, CA 94019	Client Project ID: 7900 Dublin Blvd.	Date Sampled: 02/21/03
		Date Received: 02/24/03
	Client Contact: Joe Mandine	Date Extracted: 02/24/03
	Client P.O.:	Date Analyzed: 02/27/03-03/01/03

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel*

Extraction method: SW3510C Analytical methods: SW8015C Work Order: 0302308

Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0302308-001C	GP-1-W	W	76,g,i	1	91.2
0302308-002C	GP-2-W	W	190,b,g,i	1	102
0302308-003C	GP-3-W	W	62,b	1	97.5
0302308-004C	GP-4-W	W	1200,c/m,i	1	90.2
0302308-005C	GP-5-W	W	450,g	2	103
0302308-006C	GP-6-W	W	70,g,i	1	105

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	µg/L
	S	NA	NA

* water and vapor samples are reported in µg/L, wipe samples in ug/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all TCLP / STLC / SPLP extracts in µg/L

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent / mineral spirit

DHS Certification No. 1644

_______Angela Rydelius, Lab Manager

Augeas Corporation P.O. Box 940 Half Moon Bay, CA 94019	Client Project ID: 7900 Dublin Blvd.	Date Sampled: 02/21/03
		Date Received: 02/24/03
	Client Contact: Joe Mandine	Date Extracted: 02/26/03-02/27/03
	Client P.O.:	Date Analyzed: 02/26/03-02/27/03

Oxygenated Volatile Organics by P&T and GC/MS*

Extraction Method. SW5030B
Analytical Method. SW8260B
Work Order· 0302308

Lab ID	0302308-001B	0302308-002B	0302308-003B	0302308-004B	Reporting Limit for DF =1	
Client ID	GP-1-W	GP-2-W	GP-3-W	GP-4-W		
Matrix	W	W	W	W		
DF	1	1	2	2	S	W
Compound	**Concentration**				ug/kg	µg/L
Diisopropyl ether (DIPE)	ND	ND	ND<1.0	ND<1.0	NA	0.5
Ethyl tert-butyl ether (ETBE)	ND	ND	ND<1.0	ND<1.0	NA	0.5
Methyl-t-butyl ether (MTBE)	ND	1.4	77	74	NA	0.5
tert-Amyl methyl ether (TAME)	ND	ND	ND<1.0	ND<1.0	NA	0.5
t-Butyl alcohol (TBA)	ND	ND	ND<10	13	NA	5.0
Ethanol	ND	ND	ND<100	ND<100	NA	50
Methanol	ND	ND	ND<1000	ND<1000	NA	500
1,2-Dibromoethane (EDB)	ND	ND	ND<1.0	ND<1.0	NA	0.5
1,2-Dichloroethane (1,2-DCA)	ND	ND	ND<1.0	ND<1.0	NA	0.5
Surrogate Recoveries (%)						
%SS:	108	109	110	111		
Comments	i	i		i		

* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in µg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment, j) sample diluted due to high organic content.

DHS Certification No. 1644

______Angela Rydelius, Lab Manager

Augeas Corporation P.O. Box 940 Half Moon Bay, CA 94019	Client Project ID: 7900 Dublin Blvd.	Date Sampled: 02/21/03 Date Received: 02/24/03
	Client Contact: Joe Mandine	Date Extracted: 02/26/03-02/27/03
	Client P.O.:	Date Analyzed: 02/26/03-02/27/03

Oxygenated Volatile Organics by P&T and GC/MS*

Extraction Method: SW5030B
Analytical Method: SW8260B
Work Order: 0302308

Lab ID	0302308-005B	0302308-006B			Reporting Limit for DF =1	
Client ID	GP-5-W	GP-6-W				
Matrix	W	W				
DF	1	1			S	W
Compound	**Concentration**				ug/kg	µg/L
Diisopropyl ether (DIPE)	ND	ND			NA	0.5
Ethyl tert-butyl ether (ETBE)	ND	ND			NA	0.5
Methyl-t-butyl ether (MTBE)	ND	ND			NA	0.5
tert-Amyl methyl ether (TAME)	ND	ND			NA	0.5
t-Butyl alcohol (TBA)	ND	ND			NA	5.0
Ethanol	ND	ND			NA	50
Methanol	ND	ND			NA	500
1,2-Dibromoethane (EDB)	ND	ND			NA	0.5
1,2-Dichloroethane (1,2-DCA)	ND	ND			NA	0.5
Surrogate Recoveries (%)						
%SS:	111	110				
Comments	i	i				

* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in µg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) sample diluted due to high organic content.

DHS Certification No. 1644

_______Angela Rydelius, Lab Manager

McCampbell Analytical Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: W WorkOrder: 0302308

EPA Method: SW8021B/8015Cm Extraction: SW5030B BatchID: 5976 Spiked Sample ID: 0302297-001A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(gas)	ND	60	115	114	0.641	97.6	108	9.78	70	130
MTBE	6.591	10	92.9	91.8	0.686	101	102	1.52	70	130
Benzene	ND	10	111	107	3.86	107	109	1.72	70	130
Toluene	ND	10	105	102	3.55	102	104	2.23	70	130
Ethylbenzene	ND	10	115	111	3.42	111	112	1.54	70	130
Xylenes	ND	30	117	110	5.88	110	110	0	70	130
%SS:	104	100	97.7	97.1	0.658	94.8	95.7	0.950	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.
NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

McCampbell Analytical Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

QC SUMMARY REPORT FOR SW8015C

Matrix: W WorkOrder: 0302308

EPA Method: SW8015C Extraction: SW3510C BatchID: 5985 Spiked Sample ID: N/A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(d)	N/A	7500	N/A	N/A	N/A	96.6	96	0.574	70	130
%SS:	N/A	100	N/A	N/A	N/A	88.8	87.9	1.01	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.
NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

McCampbell Analytical Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

QC SUMMARY REPORT FOR SW8260B

Matrix: W WorkOrder: 0302308

EPA Method: SW8260B Extraction: SW5030B BatchID: 5977 Spiked Sample ID: N/A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
Diisopropyl ether (DIPE)	N/A	10	N/A	N/A	N/A	120	120	0.480	70	130
Ethyl tert-butyl ether (ETBE)	N/A	10	N/A	N/A	N/A	120	119	0.638	70	130
Methyl-t-butyl ether (MTBE)	N/A	10	N/A	N/A	N/A	120	118	1.59	70	130
tert-Amyl methyl ether (TAME)	N/A	10	N/A	N/A	N/A	119	119	0.563	70	130
Methanol	N/A	2500	N/A	N/A	N/A	103	115	11.6	70	130
Ethanol	N/A	500	N/A	N/A	N/A	108	113	4.14	70	130
1,2-Dibromoethane (EDB)	N/A	10	N/A	N/A	N/A	103	99.1	4.20	70	130
1,2-Dichloroethane (1,2-DCA)	N/A	10	N/A	N/A	N/A	117	112	3.82	70	130
%SS:	N/A	100	N/A	N/A	N/A	97.4	94	3.54	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.
NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.