

December 12, 1997
705-1.TRAAC

Ms. Susan Hugo
Alameda County Health Care Services Agency
Environmental Protection (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda County, California 94502-9335

Subject: Letter of Transmittal for Monitoring Well Installation Report 705-2, for 1372
Ocean Avenue, Emeryville, California.

Ms. Hugo:

We are pleased to submit the enclosed report outlining the work performed at the
above mentioned property in October 1997.

If you have any questions or comments, please contact me at (510) 530-8751. Thank you.

Sincerely,
International Geologic



Steve Bittman
Project Manager

cc: Mr. Kevin Graves
California Regional Water Quality Control Board
2101 Webster Street, Suite 500
Oakland, California 94612

Mr. Doug Ralston
Plant Insulation Company
1300 64th Street
Emeryville, California 94662

97 DEC 12 AM 3:47
ENVIRONMENTAL
PROTECTION

Groundwater Monitoring Well Installation Report

**for
1372 Ocean Avenue
Emeryville, California**

Prepared by

**INTERNATIONAL GEOLOGIC
2831 Sylhowe Road
Oakland, California 94602**

December 12, 1997

Groundwater Monitoring Well Installation Report

for
**1372 Ocean Avenue
Emeryville, California**

INTRODUCTION

The subject property is located at 1372 Ocean Avenue in Emeryville, California and is owned by the "Plant Insulation Company" of Emeryville, California (see site Vicinity Map, Figure 1). The site consists of a warehouse and adjoining storage yard built in 1955, and had been used by a trucking company during the 1950's and 1960's. A 2,500 ft² concrete and asphalt surfaced storage yard adjoins the west side of an onsite warehouse building.

BACKGROUND

During preparations for the sale of the property, a suspected former fuel dispenser island was identified against the west fence in the yard area, suggesting the possible existence of an underground storage tank (UST) beneath the property (see Figure 2, Site Plan/Project Area Map). Mr. Doug Ralston, President of Plant Insulation Company, had no knowledge of a UST beneath the property, and subsurface locating techniques utilized near the area of the apparent fuel dispenser island, failed to locate a tank.

Subsequently on March 31, 1997, the suspected UST and dispenser areas were investigated by exploration/excavation. During excavations that reached approximately 4 feet below the ground surface (bgs) in a 15 foot by 15 foot area, an abandoned supply line and large sections of broken concrete slab were brought to the surface, suggesting that at least one UST had been removed at some time prior to Plant Insulation Company's ownership of the property (approximately 1975).

On April 10th, 1997, one soil sample was collected at a depth of 5.5 feet bgs, and one grab groundwater sample was collected at a depth of approximately 6.5 feet bgs from a hand augured boring (B-1) in the excavation area (see Figure 2). The samples were laboratory analyzed for petroleum hydrocarbons as gasoline (TPHg) and diesel (TPHd), total and dissolved lead, and volatile and semi-volatile organic compounds. Analytical results of the soil sample indicated the presence of 150 parts per million (ppm) TPHg and 430 ppm TPHd. The groundwater sample contained 330 parts per billion (ppb) TPHg and 7,000 ppb TPHd. A soil sample collected from the former dispenser area at a depth of 2 feet bgs contained up to 210 ppm TPHd.

Detailed descriptions regarding site history, the discovery of the former underground fuel tank location and laboratory analytical results of soil and groundwater samples collected on site as part of the excavation work, can be reviewed in the International Geologic Letter Report, Subsurface Investigation Related To A Suspected Underground Storage Tank Location, For 1372 Ocean Avenue, Emeryville, California May 7, 1997.

LOCAL GEOLOGY/HYDROGEOLOGY

Geology

The area of Emeryville that includes the subject site has been mapped by Helley, *et al* (1979) as "Unconsolidated, plastic, moderately to poorly sorted silt and clay rich in organic material" Beneath the alluvial units are relatively impermeable, consolidated rocks of Jurassic to late Tertiary Age Franciscan Complex, which consist mainly of marine sedimentary rocks with some volcanic rocks and serpentinite.

Soil borings drilled in 1992 during a soil and groundwater investigation on the adjoining property to the west (RIX Industries, 6460 Hollis Street), showed the upper 16 feet of subsurface soils to consist of "Silty Clay" and "Clayey Sand" (Hageman/Aguiar, 6/23/92).

Hydrogeology

The depth to first encountered groundwater as measured during drilling at the above mentioned RIX property, was approximately 5 feet bgs under slightly confined conditions. The direction of groundwater flow beneath the RIX property has been most recently calculated to be approximately west (Hageman/Aguiar, 10/13/95). Groundwater beneath the area of the site is reportedly not used for municipal water supply or farm irrigation.

MONITORING WELL INSTALLATION

A requirement for a groundwater monitoring well to determine the extent of soil and groundwater contamination beneath the property, was set forth in a letter from the Alameda County Health Care Services Agency (ACHCSA) dated July 17, 1997. A copy of this letter is included in Attachment 1 of this report.

Safety Precautions and Permit

Field work for the current phase of work was conducted in accordance with the International Geologic Site Safety Plan No. 705-2, dated September 18, 1997 which is intended to meet the requirements of OSHA 29 CFR 1910.120.

Prior to the drilling of the soil boring and construction of the monitoring well, a permit was acquired from the Alameda County Public Works Agency. A copy of the permit is included in Attachment 1 to this report.

Soil Boring/Well Construction

On October 11, 1997, boring SB-1 was drilled to a depth of 16 feet bgs in a location about 9 feet in the downgradient direction of the former UST location. Soil samples were collected during drilling, and groundwater monitoring well MW-1 was constructed in the boring. Drilling and monitoring well construction was performed by V & W Drilling of Rio Vista, California. Field procedures performed during the drilling, soil sampling, and logging of the soil boring, as well as the construction of MW-1 are presented in Attachment 2 to this report. The location of monitoring well MW-1 is shown on Figure 2. A soil log of boring SB-1 and well construction details for well MW-1 are shown on Figure 3.

Well Development

Well MW-1 was developed on October 12, 1997. Field procedures performed during the well development are outlined in Attachment 2 to this report. Turbidity measurements and other observations noted during well development were noted on a Well Development Data Sheet, also presented in Attachment 2.

LABORATORY ANALYSES OF SOIL SAMPLES

Soil samples collected from SB-1 at depths of 5.5 feet bgs, 7 feet bgs and 11.5 feet bgs were submitted for Laboratory analyses at McCampbell Analytical, Inc., Pacheco, California (DHS Certified Number 1644). Soil samples collected from the boring were analyzed for the following:

- o Total Petroleum Hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl-tertiary-butyl-ether (MTBE) by EPA Test Method 8015/8020/5030.
- o Total Petroleum Hydrocarbons as diesel (TPHd) by EPA Test Method 8015/3550.
- o Volatile organic compounds (VOCs) by EPA Test Method 8010/601.
- o Semi-volatile organic compounds by EPA Test Method 8270A.

Laboratory results of soil samples collected from boring SB-1 are shown in Table 1. The sample chain of custody record and laboratory data sheets are presented in Attachment 3 to this report.

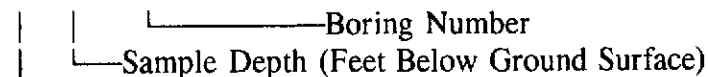
TABLE 1
RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES
1372 Ocean Avenue
Emeryville, California

Compound	Sample No. S-5.5-SB-1	Sample No. S-7-SB-1	Sample No. S-11.5-SB-1
TPHg	180 ^j	<1.0	<1.0
TPHd	500 ^{c g b}	3.6 ^g	<1.0
MTBE	<0.05	<0.05	<0.05
Benzene	<0.005	<0.005	<0.005
Toluene	0.35	<0.005	<0.005
Ethylbenzene	0.52	<0.005	<0.005
Xylenes	1.4	<0.005	<0.005

Results expressed in parts per million (ppm).

- TPHg: Total petroleum hydrocarbons as gasoline.
- TPHd: Total petroleum hydrocarbons as diesel.
- MTBE: Methyl-Tertiary-Butyl-Ether.
- b: Diesel range compounds are significant; no recognizable pattern.
- c: Aged diesel (?) is significant.
- g: Oil range compounds are significant.
- j: No recognizable pattern.

S-5.5-SB-1



Soil

GROUNDWATER SAMPLE COLLECTION AND LABORATORY ANALYSES

Groundwater Sample Collection

A groundwater sample was collected from well MW-1 on October 19, 1997. Field procedures used by International Geologic during well sampling procedures, including a well sampling data sheet, are presented in Attachment 2 to this report.

Analytical Laboratory Methods/Results

Laboratory analyses were performed at McCampbell Analytical, Inc., in Pacheco, California. The groundwater sample was analyzed for the following:

- o TPHg, BTEX, and MTBE by EPA Test Method 8015/8020/5030.
- o TPHd by EPA Test Method 8015/3550.
- o VOCs by EPA Test Method 8010/601.
- o Semi-volatile organic compounds by EPA Test Method 8270A.

Laboratory results of the groundwater sample collected from well MW-1 are shown in Table 2 on the following page. The sample chain of custody record and laboratory data sheets are presented in Attachment 3.

TABLE 2
RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLE
1372 Ocean Avenue
Emeryville, California

Compound	Sample No. MW-1
TPHg	<50
TPHd	120 ^b
MTBE	<5.0
Benzene	<0.005
Toluene	<0.005
Ethylbenzene	<0.005
Xylenes	<0.005
1,1- Dichloroethene	0.57
cis 1,2-Dichloroethene	12
trans 1,2-Dichloroethene	2.2
Tetrachloroethene	6.0
Trichlorethene	41
Trichlorflouromethane	2.5
Vinyl Chloride	1.1

Results expressed in parts per billion (ppb).

TPHg: Total petroleum hydrocarbons as gasoline.

TPHd: Total petroleum hydrocarbons as diesel.

MTBE: Methyl-Tertiary-Butyl-Ether.

b: Diesel range compounds are significant; no recognizable pattern.

FINDINGS

- 1) Shallow soil in the area of the former tank location contains residual hydrocarbons. Concentrations of 500 ppm TPHd and 180 ppm TPHg were detected in soil sample S-5.5-SB-1, (collected 5.5 feet below the ground surface).
- 2) Soil samples S-7-SB-1 and S-11.5-SB-1 (collected at 7 feet and 11.5 feet below the surface respectively) did not contain detectable concentrations of hydrocarbons, with the exception of 3.6 ppm TPHd detected in sample S-7-SB-1.
- 3) Laboratory analyses of the soil samples collected from boring SB-1 suggest that most if not all of the hydrocarbons present in shallow soils are "aged diesel."
- 4) No detectable concentrations of volatile or semi-volatile organic compounds were present in the analyzed soil samples.
- 5) 120 ppb TPHd was present in the groundwater sample collected from well MW-1. TPHg, BTEX and MTBE were not detected in the groundwater sample.
- 6) The following VOCs were detected in the groundwater sample collected from well MW-1:
 - 1,1- Dichloroethene 0.57 ppb
 - cis 1,2-Dichloroethene 12 ppb
 - trans 1,2-Dichloroethene 2.2 ppb
 - Tetrachloroethene 6.0 ppb
 - Trichloroethene 41 ppb
 - Trichlorofluoromethane 2.5 ppb
 - Vinyl Chloride 1.1 ppb
- 7) No semi-volatile compounds were detected in the groundwater sample collected from MW-1.

DISCUSSION

Although the subject property formerly had an underground fuel (probably diesel) tank sometime before approximately 1975, and that the tank or associated piping may have leaked, it should be noted that the quality of soil and groundwater beneath the entire west Berkeley area has been degraded over the last few decades. There are numerous soil and groundwater contamination cases and spill reports documented in the immediate area around the subject site. For example, the adjoining property at 6460 Hollis Street (formerly RIX Industries), has had concentrations of up to 3,000 ppm TPHd and 31 ppm tetrachloroethene detected in shallow soil onsite. Up to 20,000 ppb TPHd, 2,200 ppb tetrachloroethane, and 81 ppb trichloroethane were detected in groundwater samples collected from monitoring wells on the RIX site in 1992 (ACHCSA, 1995).

The most recent groundwater monitoring to take place at the RIX property was in October 1995. Concentrations of up to 2,600 ppb TPHd, 14 ppb Tetrachloroethene and 53 ppb Trichloroethene were detected in groundwater samples. These are all compounds that have been detected in soil and groundwater samples on the subject property.

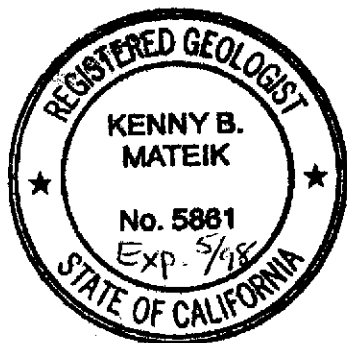
Groundwater flow direction beneath the RIX Industries site was calculated as approximately west towards Hollis Street, at a gradient of approximately 0.06 ft/ft, using measurements from the three onsite wells on October 13, 1995. Although the RIX site is hydraulically downgradient from the subject site, the affected area on the RIX site is only 150 feet from well MW-1 on the subject site. This suggests that soil and/or groundwater beneath the subject property may have been impacted by the RIX site. This may be particularly true for the VOCs detected in the groundwater sample collected from well MW-1, since these types of chemicals were evidently never used or stored on the subject site.

RECOMMENDATIONS

- 1) Groundwater samples should be collected from well MW-1 on a quarterly basis for a period of one year- March 1998, June 1998, September 1998, and December 1998.
- 2) Groundwater samples collected from well MW-1 should analyzed at a laboratory certified by the state of California, for TPHg/BTEX using EPA Method 8015/8020/5030, TPHd using EPA Test Method 8015/3550, and for VOCs using EPA Test Method 601.
- 3) A quarterly letter report should be prepared documenting field observations and laboratory results. The report should be signed by a geologist registered by the state of California.
- 4) If hydrocarbon and VOC concentrations remain constant or decrease after the one year period, site closure should be granted.

CERTIFICATION

We certify that the work presented in this report was performed under our supervision. To the best of our knowledge, the data contained herein are true and accurate, and the work was performed in accordance with professional standards.



Steve Bittman 12/12/97
Steve Bittman Date
Project Manager

Ken Mateik 12/12/97
Ken Mateik Date
CA Registered Geologist No. 5861

REFERENCES

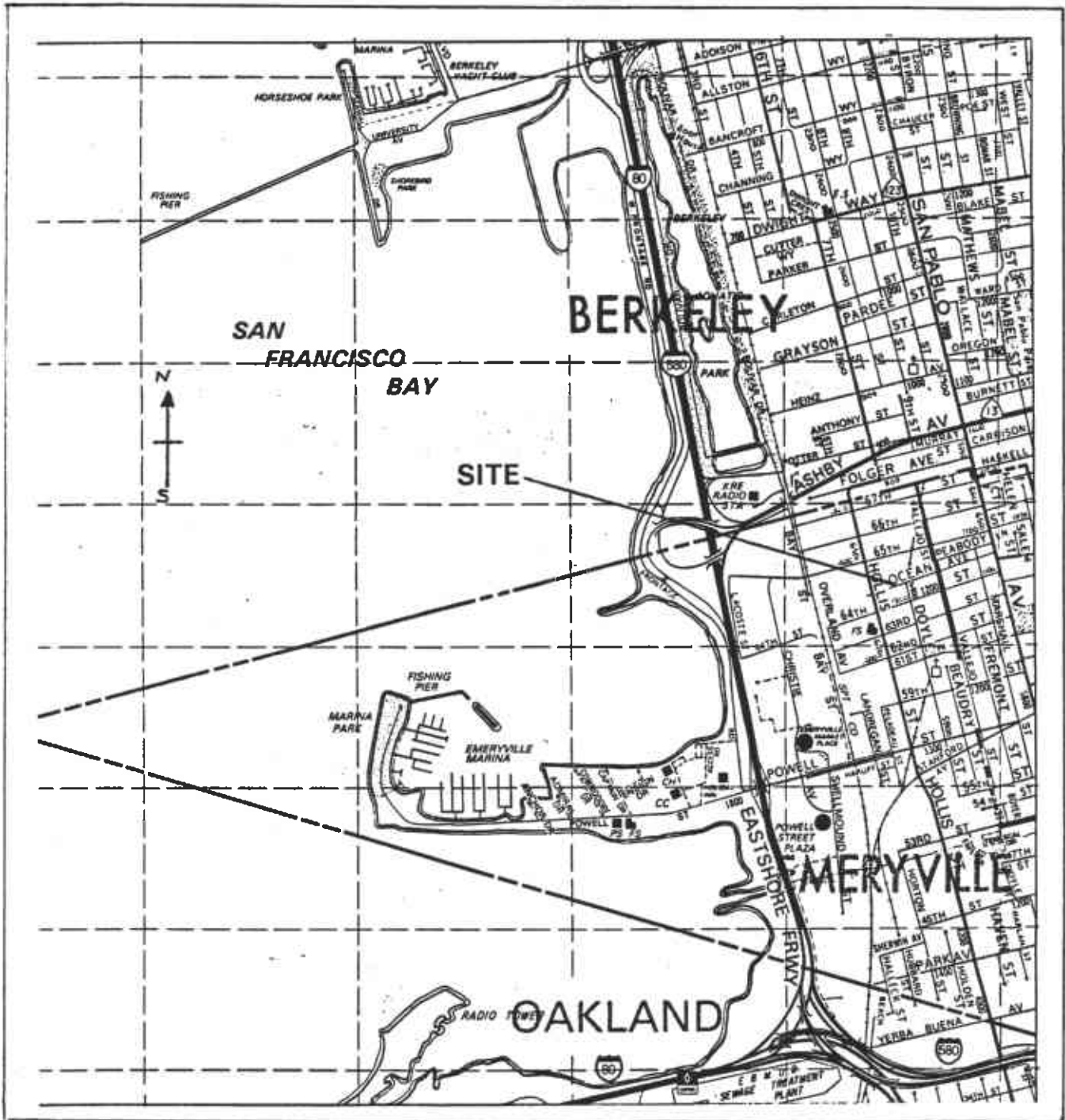
Alameda County Health Care Services Agency, Department of Environmental Health. Letter to Mr. Frank DeWolfe, Subject: Confirmation of Closure For Ten USTs at RIX Industries, 6460 Hollis Street, Emeryville, California. May 3, 1995.

Alameda County Health Care Services Agency, Department of Environmental Health. Groundwater Monitoring Summary for RIX Industries, 6460 Hollis Street, Emeryville, California. October, 1995.

International Geologic. Letter Report, Subsurface Investigation Related To A Suspected Underground Storage Tank Location, For 1372 Ocean Avenue, Emeryville, California May 7, 1997.

LIMITATIONS

This report was prepared in accordance with standards of environmental geological practice generally accepted in California at the time this investigation was performed. This investigation was conducted solely for the purpose of evaluating environmental conditions with respect to a limited scan of hydrocarbons and volatile and semi-volatile organic compounds in the area sampled at the subject property. Evaluation of conditions at and near the site for the purpose of this investigation is made from a limited number of observation points. Actual subsurface conditions may differ at locations not sampled within the property. Further investigation, including subsurface exploration and laboratory testing of soil and groundwater samples collected at the site, can aid in evaluating subsurface environmental conditions and reduce the inherent uncertainties associated with this type of limited environmental assessment. Accuracy or completeness of public and proprietary records used to conduct limited assessments of this type is not implied. No soil engineering or geotechnical references are implied nor should be inferred.



INTERNATIONAL GEOLOGIC Job No. 705-2
 1372 Ocean Avenue
 Emeryville, California

SITE VICINITY MAP
 (Source: Thomas Bros, 1994)
FIGURE 1



WAREHOUSE

1372 OCEAN AVENUE

SHED

SLAB

OFFICE

BORING B-1 LOCATION

DISPENSER AREA

EXCAVATIC

← 115 ft →

MW-1 LOCATION

PROPERTY BOUNDARY

RIX INDUSTRIES PROPERTY

OCEAN AVENUE

APPROXIMATE
DIRECTION OF
GROUNDWATER FLOW

October 13, 1995

(as calculated by Hageman Aguiar, Inc.)

AREA OF CLOSED/
ABANDONED UST's

YARD AREA

OVERHANG

BUILDING

TO HOLLIS
STREET



INTERNATIONAL GEOLOGIC

Boring/Well No.: SB-1/MW-1

Date Drilled: 10/11/97

Total Boring Depth: 16.5 FEET

Depth to Water During Drilling: 7.5'

Boring Diameter: 8 INCHES

Depth to Water 10/12/97: 4.09'

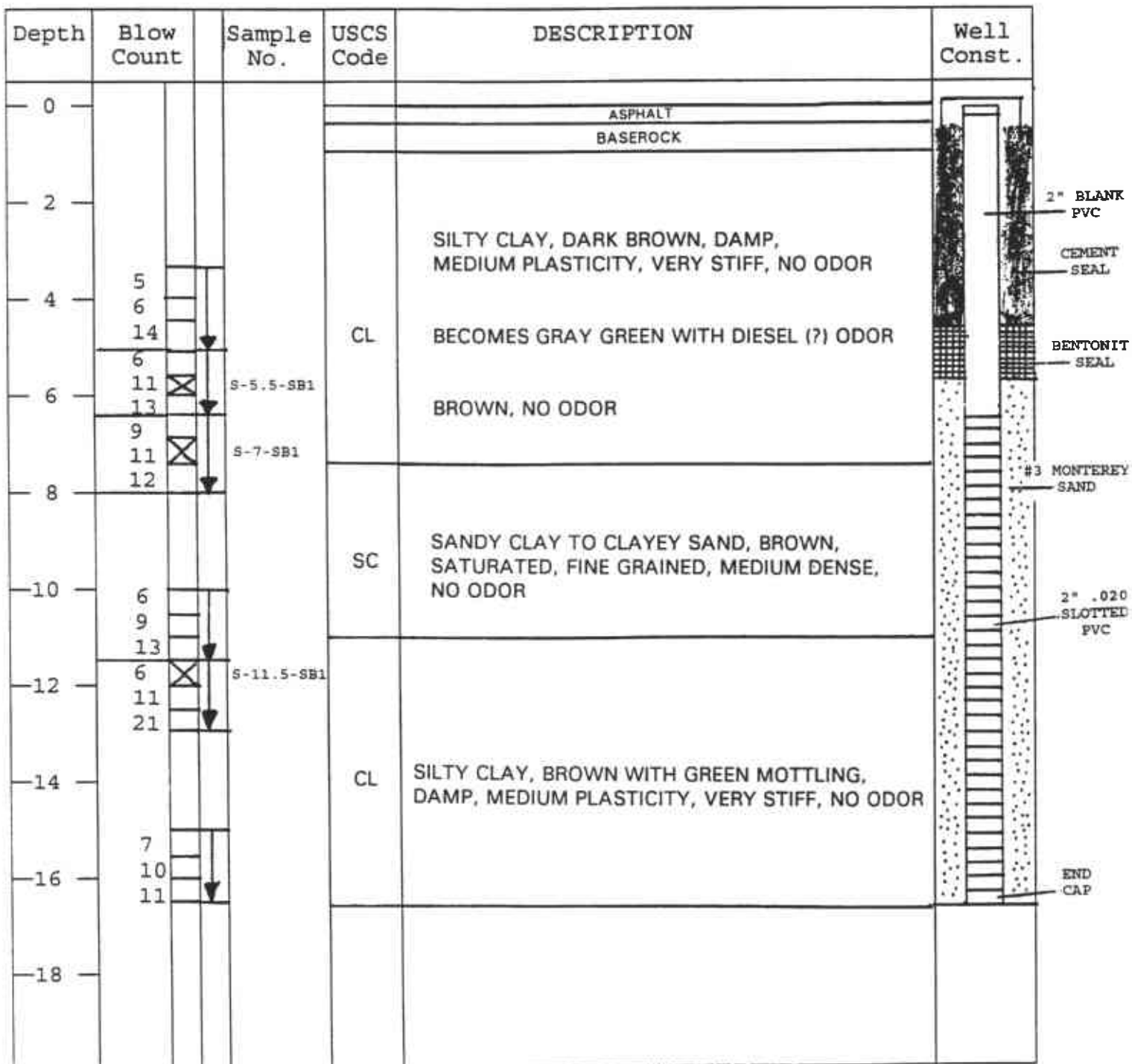
Casing Diameter: 2 INCHES

Drilling Company: V & W DRILLING

Driller: ROBERT VICKERY

Drilling Method: HOLLOW STEM AUGER

Field Geologist: STEVE BITTMAN



INTERNATIONAL GEOLOGIC Job No. 705-2

FIGURE 3

1372 Ocean Avenue
Emeryville, California

ALAMEDA COUNTY
HEALTH CARE SERVICES

AGENCY
DAVID J. KEARS, Agency Director



July 17, 1997
STID # 6449

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

Mr. Doug Ralston
Plant Insulation Company
1300 64th Street
Emeryville, California 94608

**RE: Underground Storage Tank Reportedly Removed at 1372 Ocean Avenue
Emeryville, California 94608**

Dear Mr. Ralston:

This office has completed review of the "Letter Report" dated May 7, 1997, prepared and submitted by International Geologic for the above referenced site. The report documents the exploratory excavation work performed concerning the underground storage tank (UST) reportedly removed at the subject property.

A former fuel dispenser island was identified in the yard area during preparation for the sale of the property. Subsurface locating techniques were utilized at the site but did not identify the presence of the UST. Exploratory excavation was conducted on March 31, 1997 near the former dispenser island. An apparent supply line was uncovered leading from the dispenser island but no UST was found. Pieces of concrete were apparently used as backfill for the excavation where the tank may have been removed.

Two soil samples were collected. Sample S-5.5-B1 was collected from the tank excavation area at 5.5 feet bgs and S-2-D1 was collected 2 feet beneath the dispenser area. Analytical results showed up to 150 ppm TPH gasoline, 430 ppm TPH diesel, 0.20 ppm toluene, 0.38 ppm ethylbenzene, 1.2 ppm xylenes, 4.4 ppm lead, 0.43 ppm 2-methylnaphthalene, 0.18 ppm N-Nitroso-Di-N-Phenylamine and 0.19 ppm phenanthrene. A grab water sample was also collected from the bottom of the tank pit and detected 330 ppb TPH gasoline, 7,000 ppb TPH diesel, 8.5 ppb MTBE, 0.69 ppb xylenes, 13 ppb lead, 11.8 ppb DCE, 40 ppb TCE, 1.5 ppb vinyl chloride and 2.7 ppb trichlorofluoromethane.

Based on this review, the extent of the soil and groundwater contamination must be determine in order to evaluate if the site is a low risk soil or groundwater case. You may address this issue by advancing a boring within ten feet of the former tank area in the verified downgradient direction. At a minimum, one soil sample must be collected preferably at the soil / groundwater interface. In addition, a groundwater sample shall also be collected. Both soil and groundwater samples must

Mr. Doug Ralston
RE: 1372 Ocean Avenue, Emeryville, CA 94608
July 17, 1997
Page 2 of 2

be analyzed for the following target compounds: TPH gasoline, TPH diesel, BTEX, MTBE, chlorinated hydrocarbons and semi volatile organic compounds. If the levels of contaminants detected in the soil and the groundwater samples meet the ASTM Risk Based Corrective Action (RBCA) Tier 1 Risk Based Screening Level (RBSL), we will then evaluate the site for closure as a low risk soil or groundwater case.

Please submit a brief work plan addressing all the items mentioned above no later than September 1, 1997. I have enclosed a blank copy of the Underground Storage Tank Unauthorized Release (Leak)/ Contamination Site Report which must be completed and submitted to this office within five working days upon receipt of this letter.

All reports and proposals must be submitted under seal of a California Registered Geologist or Registered Civil Engineer with a statement of qualifications for each lead professional involved with the project.

If you have any questions concerning this letter, please contact me at (510) 567-6780.

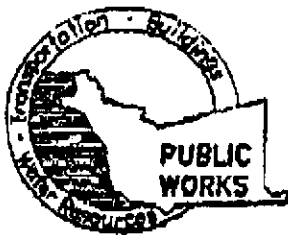
Sincerely,



Susan L. Hugo
Senior Hazardous Materials Specialist

enclosure

c: Mee Ling Tung, Director, Environmental Health
Gordon Coleman, Chief, Environmental Protection Division
Kevin Graves, San Francisco Bay RWQCB
Steve Bittman, International Geologic, 2831 Sylhowe Road, Oakland, CA 94602
SH / files



ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION

951 TURNER COURT, SUITE 300, HAYWARD, CA 94545-7651
PHONE (510) 670-5575 ANDREAS GODFREY FAX (510) 670-5262
(510) 670-5248 ALVIN KAN

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 1372 Ocean Ave
Emeryville, CA

PERMIT NUMBER 97WR110
WELL NUMBER _____
APN _____

California Coordinates Source _____ ft. Accuracy ± _____ ft.
NAD 83 _____ N. CCE _____ ft.
APN 49-1494-5-1

PERMIT CONDITIONS

Circled Permit Requirements Apply

CLIENT Plant Insulation Co.
Address 1300 64th St Phone 510-654-7863
City Emeryville CA Zip 94602

A. GENERAL

1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA 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.

APPLICANT International Geologic
Address 2831 Sylvan Ave Phone 510-530-8794
City Oakland CA Zip 94602

B. WATER SUPPLY WELLS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 30 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

TYPE OF PROJECT
Well Construction Geotechnical Investigation
Cathodic Protection General
Water Supply Contamination
Monitoring Well Destruction

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

PROPOSED WATER SUPPLY WELL USE
New Domestic Replacement Domestic
Municipal Irrigation N/A
Industrial Other _____

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 curing.

DRILLING METHOD:
Mud Rotary Air Rotary Auger
Cable Other

E. CATHODIC

Fill hole above anode zone with concrete placed by tremie.

DRILLER'S LICENSE NO. C-57-658781

F. WELL DESTRUCTION

See attached.

WELL PROJECTS
Drill Hole Diameter 4 in. Maximum _____
Casing Diameter 2 in. Depth 20 ft.
Surface Seal Depth 5 ft. Number 1

G. SPECIAL CONDITIONS

GEOTECHNICAL PROJECTS
Number of Borings _____ Maximum _____
Hole Diameter _____ in. Depth _____ ft.

ESTIMATED STARTING DATE 9/18/97
ESTIMATED COMPLETION DATE 9/18/97

APPROVED Alvin Kan DATE 9/11

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

APPLICANT'S SIGNATURE Steve Bittman DATE 9-8-97

Post-it* Fax Note	7671	Date	9/11/97	# of pages	1
To	STEVE BITTMAN	From	ALVIN KAN		
Co./Dept.		Co.	ACWPA		
Phone #		Phone #	670-5248		
Fax #		Fax #			

FIELD PROCEEDURES

Drilling of Soil Borings

The first 5 feet of the boring was advanced with a hand auger in order to check for subsurface obstructions. The boring was drilled with a truck-mounted drill rig operated by V & W Drilling Company, Inc., of Rio Vista, California (C-57 658781), using 8-inch-diameter, hollow-stem augers. The augers were steam-cleaned prior to drilling the boring to minimize the possibility of cross-contamination. Drill cuttings were stored on site in a DOT-17-E "open top" 55-gallon capacity drum.

Collecting Soil Samples From Soil Borings

Soil samples were collected continuously from the ground surface to the total depth of the boring. The soil samples were collected by advancing the boring to a point immediately above the sampling depth, and then driving a California-modified, split-spoon sampler containing brass sleeves through the hollow center of the auger into the soil. The sampler and brass sleeves were laboratory-cleaned, steam-cleaned, or washed thoroughly with TSP and water, prior to each use. The sampler was driven 18 inches with a standard 140-pound hammer repeatedly dropped 30 inches. The number of blows to drive the sampler each successive 6 inches was counted and recorded to evaluate the relative consistency of the soil.

The samples selected for laboratory analyses were removed from the sampler and quickly sealed in their brass sleeves with teflon liners, plastic caps, and aluminized duct tape. The samples were then labeled and promptly placed in iced storage.

Monitoring Well Construction

The monitoring well was constructed in the boring using new 2-inch-diameter, thread-jointed, Schedule 40 polyvinyl chloride (PVC) casing. No chemical cements, glues, or solvents were used in well construction. The casing bottom was sealed with a screw-fastened end-plug, and the casing top with a locking plug. The screened portion of the well was constructed of machine-slotted PVC casing with 0.020-inch-wide slots. The screened section in the monitoring well was placed to allow monitoring during seasonal fluctuations of groundwater levels.

The annular space of the well was backfilled with No. 3 Monterey Sand to approximately two feet above the top of the screened casing. A 1-foot thick bentonite plug was placed above the sand as a seal against cement entering the filter pack. The remaining annulus was then backfilled with a slurry of water and cement to approximately one foot below the ground surface.

An aluminum utility box was placed over the wellhead and set in concrete placed slightly above the surrounding ground surface. The wellhead cover has a seal to protect the monitoring well against surface-water infiltration.

Groundwater Monitoring Well Development

The monitoring well was developed by bailing and surge-block techniques. The well was bailed, allowed to recharge, and bailed again until the water removed from the well was determined to be relatively clear. The development method used, initial turbidity measurement, volume of water removed, final turbidity measurement, and other pertinent field data were recorded on a Well Development Data Sheet included at the end of the protocol description. The well was allowed to equilibrate for approximately 48 hours after development prior to sampling. Water generated by well development was stored in a 17-E DOT 55-gallon capacity drum on site and will remain the responsibility of the client.

Groundwater Monitoring Well Sampling

The static water level in the well was measured to the nearest 0.01-foot using an electric water-level sounder cleaned with TSP and water before use. The liquid in the well was examined for visual evidence of contamination by gently lowering approximately half the length of a new disposable bailer past the air/water interface. The sample was then retrieved and inspected for floating product, sheen, emulsion, color, and clarity.

The well were purged using a dedicated PVC bailer cleaned with TSP and water prior to use. During the well purging process, electrical conductivity, Ph, and temperature values of the groundwater were recorded on a Well Sampling Data Sheet included at the end of the protocol description. Approximately four well casing volumes were purged*. Turbidity measurements were taken of the purged well water.

Before sample collection, the water level in the well was allowed to recover to at least 80 percent of the initial level. A sample of the formation water was then collected from the well using a new disposable bailer. The water sample was then gently poured into laboratory-cleaned, amber colored, 1 liter bottles and 40-milliliter (ml) glass vials with .5 ml Hydrochloric acid added as a preservative.

Sample Labeling and Handling

Sample containers were labeled in the field with the date, project number, and sample identification, then promptly placed in iced storage for transport to the laboratory. A Chain of Custody Record was initiated by the field geologist and updated throughout handling of the samples, and accompanied the samples to a laboratory certified by the State of California for the analyses requested. Samples were transported to the laboratory promptly to help ensure that recommended sample holding times were not exceeded. Samples are properly disposed of after their useful life has expired.

*The quantity of water purged from the wells was calculated as follows:

$$1 \text{ well casing volume} = \pi r^2 h (7.48)$$

where:

r = radius of the well casing in feet.

h = column of water in the well in feet.
(depth to bottom - depth to water).

7.48 = conversion constant from cubic feet to gallons.

Gallons removed/1 well casing volume = number of well casing volumes removed from the well.

Water generated by the purging of the wells was stored on site in 17E DOT 55-gallon drums.

WELL DEVELOPMENT DATA SHEET

SITE 1372 Ocean Ave

DATE 10/12/97

WELL NO. MW1

WELL DEPTH 16 1/2'

WELL DIAMETER 2"

DEPTH TO WATER

TIME

4.09	1:45 pm

1 WELL VOLUME = 2 gal

DEVELOPMENT METHOD Bailer / Surge block

TIME	CUMULATIVE GAL. PURGED	TURBIDITY	NOTES
1:45	Start	0 ml/Liter	no odor or sheen
2:25	35 gallons	muddy	"
3:15	55 gallons	cloudy	odor?

FIELD OBSERVATIONS Slight odor of product?
 Well produces 2+ gallons/minute

RECOVERY RATE

TECHNICIAN SB

INTERNATIONAL GEOLOGIC

WELL SAMPLING DATA SHEET

SITE 1372 Ocean Ave

DATE 10/19/97

WELL NO. MW-1

WELL DEPTH 16 1/2'

WELL DIAMETER 2"

DEPTH TO WATER

TIME / DATE

1 WELL VOLUME = 2 gal

4.38	2:00 pm	10/19
4.40	3:30 pm	10/19

PURGE METHOD Bailer

COLLECTION METHOD Disposable Bailer

TIME	CUMULATIVE GAL. PURGED	TURBIDITY	pH	E.C. (umhos/cm)	TEMP(F)
2:00	Start	0 ml/Liter	10.69	1460	69.8
	2	~1 ml/Liter	9.30	820	68.2
	4	~1 ml/Liter	9.02	770	68.2
	6	~1 ml/Liter	8.48	760	67.7
	8	~1 ml/Liter	8.29	760	67.5
2:45	10	~1 ml/Liter	8.21	740	67.3

SAMPLE NO.	CONTAINER (TYPE/NUMBER)	PRESERVATIVE
MW-1	40 ml / VOA / 6 Amber Liter / 6	16 HCl

FIELD OBSERVATIONS

RECOVERY PERCENTAGE

99+ % at

3:30 Hrs

SAMPLER

SB



McCAMPBELL ANALYTICAL INC.

110 Second Avenue South, #D7, Pacheco, CA 94553
Telephone : 510-798-1620 Fax : 510-798-1622
<http://www.mccampbell.com> E-mail: main@mccampbell.com

International Geologic 2831 Sylhowe Road Oakland, CA 94602	Client Project ID: #705-2	Date Sampled: 10/10/97
		Date Received: 10/14/97
	Client Contact: Steve Bittman	Date Extracted: 10/14/97
	Client P.O:	Date Analyzed: 10/14/97

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) [*]	MTBE	Benzene	Toluene	Ethylben- zene	Xylenes	% Recovery Surrogate
81767	S-5.5-SB1	S	180j	ND	ND	0.35	0.52	1.4	119*
81768	S-7-SB1	S	ND	ND	ND	ND	ND	ND	100
81769	S-11.5-SB1	S	ND	ND	ND	ND	ND	ND	101
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	5.0	0.5	0.5	0.5	0.5	
	S		1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/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 (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.



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International Geologic 2831 Sylhowe Road Oakland, CA 94602	Client Project ID: #705-2	Date Sampled: 10/10/97
		Date Received: 10/14/97
	Client Contact: Steve Bittman	Date Extracted: 10/14/97
	Client P.O:	Date Analyzed: 10/14-10/16/97

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

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d) [~]	% Recovery Surrogate
81767	S-5.5-SB1	S	500.c.g.b	110*
81768	S-7-SB1	S	3.6.g	108
81769	S-11.5-SB1	S	ND	108
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	
	S		1.0 mg/kg	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/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) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.



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International Geologic 2831 Sylhowe Road Oakland, CA 94602	Client Project ID: #705-2	Date Sampled: 10/10/97
		Date Received: 10/14/97
	Client Contact: Steve Bittman	Date Extracted: 10/14/97
	Client P.O:	Date Analyzed: 10/15/97

Volatile Halocarbons

EPA method 601 or 8010

Lab ID	81768		
Client ID	S-7-SB1		
Matrix	S		
Compound	Concentration		
Bromodichloromethane	ND		
Bromoform ^(b)	ND		
Bromomethane	ND		
Carbon Tetrachloride ^(c)	ND		
Chlorobenzene	ND		
Chloroethane	ND		
2-Chloroethyl Vinyl Ether ^(d)	ND		
Chloroform ^(e)	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Dichlorodifluoromethane	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,1-Dichloroethene	ND		
cis 1,2-Dichloroethene	ND		
trans 1,2-Dichloroethene	ND		
1,2-Dichloropropane	ND		
cis 1,3-Dichloropropene	ND		
trans 1,3-Dichloropropene	ND		
Methylene Chloride ^(f)	ND		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	ND		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	ND		
Trichlorofluoromethane	ND		
Vinyl Chloride ^(g)	ND		
% Recovery Surrogate	95		
Comments			

* water and vapor samples and all TCLP & SPLP extracts are reported in ug/L. soil and sludge samples in ug/kg, wipe samples in ug/wipe
 Reporting limit unless otherwise stated: water/TCLP/SPLP extracts, ND<0.5ug/L; soils and sludges, ND<5ug/kg; wipes, ND<0.2ug/wipe
 ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) tribromomethane; (c) tetrachloromethane; (d) (2-chloroethoxy) ethene; (e) trichloromethane; (f) dichloromethane; (g) chloroethene; (h) a lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content.

QC REPORT FOR HYDROCARBON ANALYSES

Date: 10/13/97-10/14/97

Matrix: Soil

Analyte	Concentration (mg/kg) Sample (#79943)			Amount Spiked	% Recovery		RPD
	MS	MSD	MSD		MS	MSD	
TPH (gas)	0.000	1.818	1.814	2.03	90	89	0.2
Benzene	0.000	0.162	0.166	0.2	81	83	2.4
Toluene	0.000	0.174	0.176	0.2	87	88	1.1
Ethylbenzene	0.000	0.168	0.174	0.2	84	87	3.5
Xylenes	0.000	0.508	0.506	0.6	85	84	0.4
TPH(diesel)	0	323	325	300	108	108	0.7
TRPH (oil and grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

QC REPORT FOR HYDROCARBON ANALYSES

Date: 10/16/97

Matrix: Soil

Analyte	Concentration (mg/kg)			Amount Spiked	% Recovery		RPD
	Sample (#79443)	MS	MSD		MS	MSD	
TPH (gas)	0.000	1.921	1.820	2.03	95	90	5.4
Benzene	0.000	0.176	0.182	0.2	88	91	3.4
Toluene	0.000	0.184	0.188	0.2	92	94	2.2
Ethylbenzene	0.000	0.182	0.186	0.2	91	93	2.2
Xylenes	0.000	0.562	0.574	0.6	94	96	2.1
TPH(diesel)	0	316	319	300	105	106	1.3
TRPH (oil and grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

QC REPORT FOR EPA 8010/8020/EDB

Date: 10/15/97

Matrix: Soil

Analyte	Concentration (ug/kg)				% Recovery		
	Sample (#79443)	MS	MSD	Amount Spiked	MS	MSD	RPD
1,1-DCE	0	95	100	100	95	100	5.3
Trichloroethene	0	91	97	100	91	97	6.2
EDB	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chlorobenzene	0	93	94	100	93	94	1.6
Benzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toluene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chlorobz (PID)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

PAGE 1

McCAMPBELL ANALYTICAL
110 2ND AVE. SOUTH, #D7
PACHECO, CA 94553

REPORT DATE: 10/23/97

DATE(S) SAMPLED: 10/10/97

DATE RECEIVED: 10/14/97

ATTN: EDWARD HAMILTON
CLIENT PROJ. ID: 9637
CLIENT PROJ. NAME: IG-705-2

AEN WORK ORDER: 9710176

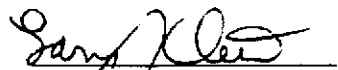
PROJECT SUMMARY:

On October 14, 1997, this laboratory received 1 soil sample(s).

Client requested sample be analyzed for chemical parameters. A portion of the sample was sent to a DOHS certified laboratory for total organic carbon analysis; the sub-contracted report will be sent under separate cover. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.


Larry Klein
Laboratory Director

McCAMPBELL ANALYTICAL

SAMPLE ID: S-7-SB1
 AEN LAB NO: 9710176-01
 AEN WORK ORDER: 9710176
 CLIENT PROJ. ID: 9637

DATE SAMPLED: 10/10/97
 DATE RECEIVED: 10/14/97
 REPORT DATE: 10/23/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Extraction for BNAs	EPA 3550	-		Extrn Date	10/16/97
EPA 8270B - Soil Matrix	EPA 8270B				
Acenaphthene	83-32-9	ND	330	ug/kg	10/18/97
Acenaphthylene	208-96-8	ND	330	ug/kg	10/18/97
Anthracene	120-12-7	ND	330	ug/kg	10/18/97
Benzdine	92-87-5	ND	1600	ug/kg	10/18/97
Benzoic Acid	65-85-0	ND	1600	ug/kg	10/18/97
Benzo(a)anthracene	56-55-3	ND	330	ug/kg	10/18/97
Benzo(b)fluoranthene	205-99-2	ND	330	ug/kg	10/18/97
Benzo(k)fluoranthene	207-08-9	ND	330	ug/kg	10/18/97
Benzo(g,h,i)perylene	191-24-2	ND	330	ug/kg	10/18/97
Benzo(a)pyrene	50-32-8	ND	330	ug/kg	10/18/97
Benzyl Alcohol	100-51-6	ND	660	ug/kg	10/18/97
Bis(2-chloroethoxy)methane	111-91-1	ND	330	ug/kg	10/18/97
Bis(2-chloroethyl) Ether	111-44-4	ND	330	ug/kg	10/18/97
Bis(2-chloroisopropyl) Ether	108-60-1	ND	330	ug/kg	10/18/97
Bis(2-ethylhexyl) Phthalate	117-81-7	ND	330	ug/kg	10/18/97
4-Bromophenyl Phenyl Ether	101-55-3	ND	330	ug/kg	10/18/97
Butylbenzyl Phthalate	85-68-7	ND	330	ug/kg	10/18/97
4-Chloroaniline	106-47-8	ND	660	ug/kg	10/18/97
2-Chloronaphthalene	91-58-7	ND	330	ug/kg	10/18/97
4-Chlorophenyl Phenyl Ether	7005-72-3	ND	330	ug/kg	10/18/97
Chrysene	218-01-9	ND	330	ug/kg	10/18/97
Dibenzo(a,h)anthracene	53-70-3	ND	330	ug/kg	10/18/97
Dibenzofuran	132-64-9	ND	330	ug/kg	10/18/97
Di-n-butyl Phthalate	84-74-2	ND	330	ug/kg	10/18/97
1,2-Dichlorobenzene	95-50-1	ND	330	ug/kg	10/18/97
1,3-Dichlorobenzene	541-73-1	ND	330	ug/kg	10/18/97
1,4-Dichlorobenzene	106-46-7	ND	330	ug/kg	10/18/97
3,3'-Dichlorobenzidine	91-94-1	ND	660	ug/kg	10/18/97
Diethyl Phthalate	84-66-2	ND	330	ug/kg	10/18/97
Dimethyl Phthalate	131-11-3	ND	330	ug/kg	10/18/97
2,4-Dinitrotoluene	121-14-2	ND	330	ug/kg	10/18/97
2,6-Dinitrotoluene	606-20-2	ND	330	ug/kg	10/18/97
Di-n-octyl Phthalate	117-84-0	ND	330	ug/kg	10/18/97
Fluoranthene	206-44-0	ND	330	ug/kg	10/18/97
Fluorene	86-73-7	ND	330	ug/kg	10/18/97
Hexachlorobenzene	118-74-1	ND	330	ug/kg	10/18/97
Hexachlorobutadiene	87-68-3	ND	330	ug/kg	10/18/97
Hexachlorocyclopentadiene	77-47-4	ND	330	ug/kg	10/18/97
Hexachloroethane	67-72-1	ND	330	ug/kg	10/18/97

McCAMPBELL ANALYTICAL

SAMPLE ID: S-7-SB1
 AEN LAB NO: 9710176-01
 AEN WORK ORDER: 9710176
 CLIENT PROJ. ID: 9637

DATE SAMPLED: 10/10/97
 DATE RECEIVED: 10/14/97
 REPORT DATE: 10/23/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
Indeno(1,2,3-cd)pyrene	193-39-5	ND	330	ug/kg	10/18/97
Isophorone	78-59-1	ND	330	ug/kg	10/18/97
2-Methylnaphthalene	91-57-6	ND	330	ug/kg	10/18/97
Naphthalene	91-20-3	ND	330	ug/kg	10/18/97
2-Nitroaniline	88-74-4	ND	1600	ug/kg	10/18/97
3-Nitroaniline	99-09-2	ND	1600	ug/kg	10/18/97
4-Nitroaniline	100-01-6	ND	1600	ug/kg	10/18/97
Nitrobenzene	98-95-3	ND	330	ug/kg	10/18/97
N-Nitrosodiphenylamine	86-30-6	ND	330	ug/kg	10/18/97
N-Nitrosodi-n-propylamine	621-64-7	ND	330	ug/kg	10/18/97
Phenanthrene	85-01-8	ND	330	ug/kg	10/18/97
Pyrene	129-00-0	ND	330	ug/kg	10/18/97
1,2,4-Trichlorobenzene	120-82-1	ND	330	ug/kg	10/18/97
4-Chloro-3-methylphenol	59-50-7	ND	330	ug/kg	10/18/97
2-Chlorophenol	95-57-8	ND	330	ug/kg	10/18/97
2,4-Dichlorophenol	120-83-2	ND	330	ug/kg	10/18/97
2,4-Dimethylphenol	105-67-9	ND	330	ug/kg	10/18/97
4,6-Dinitro-2-methylphenol	534-52-1	ND	1600	ug/kg	10/18/97
2,4-Dinitrophenol	51-28-5	ND	1600	ug/kg	10/18/97
2-Methylphenol	95-48-7	ND	330	ug/kg	10/18/97
4-Methylphenol	106-44-5	ND	330	ug/kg	10/18/97
2-Nitrophenol	88-75-5	ND	330	ug/kg	10/18/97
4-Nitrophenol	100-02-7	ND	1600	ug/kg	10/18/97
Pentachlorophenol	87-86-5	ND	1600	ug/kg	10/18/97
Phenol	108-95-2	ND	330	ug/kg	10/18/97
2,4,5-Trichlorophenol	95-95-4	ND	330	ug/kg	10/18/97
2,4,6-Trichlorophenol	88-06-2	ND	330	ug/kg	10/18/97

ND = Not detected at or above the reporting limit

* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9710176
CLIENT PROJECT ID: 9637

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spikes(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analyses.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behaviour, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrument performance.

D: Surrogates diluted out.

I: Interference.

!: Indicates result outside of established laboratory QC limits.

WORK ORDER: 9710176

QUALITY CONTROL REPORT

PAGE QR-2

ANALYSIS: Semi-Volatile Organics

MATRIX: Soil/Bulk

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank
 INSTRUMENT: HP-5890 for Semi-volatiles
 UNITS: ug/kg
 METHOD: EPA 8270B

LAB ID: BLNK 1016
 PREPARED: 10/16/97
 ANALYZED: 10/17/97

INSTR RUN: GCMS10\971016000000\1/
 BATCH ID: BNAS101697
 DILUTION: 1.00

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
2-Fluorophenol (surr)	78.3			100	78.3	29	101		
Phenol-d5 (surr)	80.5			100	80.5	32	112		
Nitrobenzene-d5 (surr)	79.4			100	79.4	37	100		
2-Fluorobiphenyl (surr)	84.3			100	84.3	43	100		
2,4,6-Tribromophenol(surr)	87.3			100	87.3	40	109		
Terphenyl-d14 (surr)	109			100	109	51	122		
Phenol	ND		330						
2-Chlorophenol	ND		330						
1,4-Dichlorobenzene	ND		330						
N-Nitrosodi-n-propylamine	ND		330						
1,2,4-Trichlorobenzene	ND		330						
4-Chloro-3-methylphenol	ND		330						
Acenaphthene	ND		330						
4-Nitrophenol	ND		1600						
2,4-Dinitrotoluene	ND		330						
Pentachlorophenol	ND		1600						
Pyrene	ND		330						
Acenaphthylene	ND		330						
Anthracene	ND		330						
Benzidine	ND		1600						
Benzoic Acid	ND		1600						
Benzo(a)anthracene	ND		330						
Benzo(b)fluoranthene	ND		330						
Benzo(k)fluoranthene	ND		330						
Benzo(g,h,i)perylene	ND		330						
Benzo(a)pyrene	ND		330						
Benzyl Alcohol	ND		660						
Bis(2-chloroethoxy)methane	ND		330						
Bis(2-chloroethyl) Ether	ND		330						
Bis(2-chloroisopropyl) Eth	ND		330						
Bis(2-ethylhexyl) Phthalat	ND		330						
4-Bromophenyl Phenyl Ether	ND		330						
Butylbenzyl Phthalate	ND		330						
4-Chloroaniline	ND		660						
2-Chloronaphthalene	ND		330						
4-Chlorophenyl Phenyl Ether	ND		330						
Chrysene	ND		330						
Dibenzo(a,h)anthracene	ND		330						
Dibenzofuran	ND		330						
Di-n-butyl Phthalate	ND		330						
1,2-Dichlorobenzene	ND		330						
1,3-Dichlorobenzene	ND		330						
3,3'-Dichlorobenzidine	ND		660						
Diethyl Phthalate	ND		330						
Dimethyl Phthalate	ND		330						
2,6-Dinitrotoluene	ND		330						
Di-n-octyl Phthalate	ND		330						
1,2-Diphenylhydrazine	ND		330						
Fluoranthene	ND		330						
Fluorene	ND		330						
Hexachlorobenzene	ND		330						
Hexachlorobutadiene	ND		330						
Hexachlorocyclopentadiene	ND		330						
Hexachloroethane	ND		330						
Indeno(1,2,3-cd)pyrene	ND		330						
Isophorone	ND		330						
2-Methylnaphthalene	ND		330						
Naphthalene	ND		330						
2-Nitroaniline	ND		1600						
3-Nitroaniline	ND		1600						
4-Nitroaniline	ND		1600						
Nitrobenzene	ND		330						
N-Nitrosodimethylamine	ND		330						
N-Nitrosodiphenylamine	ND		330						

WORK ORDER: 9710176

QUALITY CONTROL REPORT

PAGE QR-3

ANALYSIS: Semi-Volatile Organics

MATRIX: Soil/Bulk

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank		LAB ID: BLNK 1016		INSTR RUN: GCMS10\971016000000/1/					
INSTRUMENT: HP-5890 for Semi-volatiles		PREPARED: 10/16/97		BATCH ID: BNAS101697					
UNITS: ug/kg		ANALYZED: 10/17/97		DILUTION: 1.00					
METHOD: EPA 8270B									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
Phenanthrene	ND		330						
2,4-Dichlorophenol	ND		330						
2,4-Dimethylphenol	ND		330						
4,6-Dinitro-2-methylphenol	ND		1600						
2,4-Dinitrophenol	ND		1600						
2-Methylphenol	ND		330						
4-Methylphenol	ND		330						
2-Nitrophenol	ND		330						
2,4,5-Trichlorophenol	ND		330						
2,4,6-Trichlorophenol	ND		330						

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Laboratory Control Spike		LAB ID: LCS 1016		INSTR RUN: GCMS10\971016000000/2/1					
INSTRUMENT: HP-5890 for Semi-volatiles		PREPARED: 10/16/97		BATCH ID: BNAS101697					
UNITS: ug/kg		ANALYZED: 10/17/97		DILUTION: 1.00					
METHOD: EPA 8270B									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
2-Fluorophenol (surr)	46.5	78.3		100	46.5	29	101		
Phenol-d5 (surr)	48.8	80.5		100	48.8	32	112		
Nitrobenzene-d5 (surr)	47.3	79.4		100	47.3	37	100		
2-Fluorobiphenyl (surr)	57.2	84.3		100	57.2	43	100		
2,4,6-Tribromophenol (surr)	77.6	87.3		100	77.6	40	109		
Terphenyl-d14 (surr)	94.8	109		100	94.8	51	122		
Phenol	1530	ND	330	3330	45.95	28	98		
2-Chlorophenol	1580	ND	330	3330	47.45	36	108		
1,4-Dichlorobenzene	1600	ND	330	3330	48.05	36	101		
N-Nitrosodi-n-propylamine	1800	ND	330	3330	54.05	39	140		
1,2,4-Trichlorobenzene	1750	ND	330	3330	52.55	37	103		
4-Chloro-3-methylphenol	2210	ND	330	3330	66.37	42	114		
Acenaphthene	2230	ND	330	3330	66.97	39	112		
4-Nitrophenol	2050	ND	1600	3330	61.56	13	118		
2,4-Dinitrotoluene	2890	ND	330	3330	86.79	53	101		
Pentachlorophenol	2170	ND	1600	3330	65.17	18	112		
Pyrene	3320	ND	330	3330	99.70	55	121		

SAMPLE SURROGATES

SAMPLE TYPE: Sample-Client		LAB ID: 9710176-01A		INSTR RUN: GCMS10\971016000000/7/					
INSTRUMENT: HP-5890 for Semi-volatiles		PREPARED: 10/16/97		BATCH ID: BNAS101697					
UNITS: ug/kg		ANALYZED: 10/18/97		DILUTION: 1.00					
METHOD: EPA 8270B									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
2-Fluorophenol (surr)	80.2			100	80.2	29	101		
Phenol-d5 (surr)	81.1			100	81.1	32	112		
Nitrobenzene-d5 (surr)	78.5			100	78.5	37	100		
2-Fluorobiphenyl (surr)	83.2			100	83.2	43	100		
2,4,6-Tribromophenol (surr)	90.2			100	90.2	40	109		
Terphenyl-d14 (surr)	103			100	103	51	122		

----- End of Quality Control Report -----



McCAMPBELL ANALYTICAL INC.

110 Second Avenue South, #D7, Pacheco, CA 94553
 Telephone : 510-798-1620 Fax : 510-798-1622
<http://www.mccampbell.com> E-mail: main@mccampbell.com

International Geologic 2831 Sylhowe Road Oakland, CA 94602	Client Project ID: #705-2; Emeryville, CA	Date Sampled: 10/19/97
	Client Contact: Steve Bittman	Date Received: 10/21/97
	Client P.O:	Date Extracted: 10/21/97
		Date Analyzed: 10/21/97

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*
 EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) ⁺	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Recovery Surrogate
82074	MW1	W	ND	ND	ND	ND	ND	ND	93
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	5.0	0.5	0.5	0.5	0.5	
	S		1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/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 (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.



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International Geologic 2831 Sylhowe Road Oakland, CA 94602	Client Project ID: #705-2; Emeryville, CA	Date Sampled: 10/19/97
	Client Contact: Steve Bittman	Date Received: 10/21/97
	Client P.O:	Date Extracted: 10/21/97
		Date Analyzed: 10/21/97

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

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d) [*]	% Recovery Surrogate
82074	MW1	W	120,b	105
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W	50 ug/L		
	S	1.0 mg/kg		

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/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) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.



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International Geologic 2831 Sylhowe Road Oakland, CA 94602	Client Project ID: #705-2; Emeryville, CA	Date Sampled: 10/19/97
	Client Contact: Steve Bittman	Date Received: 10/21/97
	Client P.O:	Date Extracted: 10/23-10/24/97
		Date Analyzed: 10/23-10/24/97

Volatile Halocarbons

EPA method 601

Lab ID	82074		
Client ID	MW1		
Matrix	W		
Compound	Concentration		
Bromodichloromethane	ND		
Bromoform ^(b)	ND		
Bromomethane	ND		
Carbon Tetrachloride ^(c)	ND		
Chlorobenzene	ND		
Chloroethane	ND		
2-Chloroethyl Vinyl Ether ^(d)	ND		
Chloroform ^(e)	ND		
Chloromethane	ND		
Dibromochloromethane	ND		
1,2-Dichlorobenzene	ND		
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
Dichlorodifluoromethane	ND		
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		
1,1-Dichloroethene	0.57 *		
cis 1,2-Dichloroethene	12 *		
trans 1,2-Dichloroethene	2.2 *		
1,2-Dichloropropane	ND		
cis 1,3-Dichloropropene	ND		
trans 1,3-Dichloropropene	ND		
Methylene Chloride ^(f)	ND<1		
1,1,2,2-Tetrachloroethane	ND		
Tetrachloroethene	6.0		
1,1,1-Trichloroethane	ND		
1,1,2-Trichloroethane	ND		
Trichloroethene	41		
Trichlorofluoromethane	2.5		
Vinyl Chloride ^(g)	1.7 *		
% Recovery Surrogate	100		
Comments			

* water and vapor samples and all TCLP & SPLP extracts are reported in ug/L, soil and sludge samples in ug/kg, wipe samples in ug/wipe
 Reporting limit unless otherwise stated: water/TCLP/SPLP extracts, ND<0.5ug/L; soils and sludges, ND<5ug/kg; wipes, ND<0.2ug/wipe
 ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) tribromomethane; (c) tetrachloromethane; (d) (2-chloroethoxy) ethene; (e) trichloromethane; (f) dichloromethane; (g) chloroethene; (h) a lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content.

QC REPORT FOR HYDROCARBON ANALYSES

Date: 10/21/97

Matrix: WATER

Analyte	Concentration (mg/L)			Amount Spiked	% Recovery		RPD
	Sample # (82055)	MS	MSD		MS	MSD	
TPH (gas)	0.0	100.9	100.4	100.0	100.9	100.4	0.4
Benzene	0.0	10.3	10.9	10.0	103.0	109.0	5.7
Toluene	0.0	10.3	11.0	10.0	103.0	110.0	6.6
Ethyl Benzene	0.0	10.5	11.0	10.0	105.0	110.0	4.7
Xylenes	0.0	31.5	33.2	30.0	105.0	110.7	5.3
TPH(diesel)	0	137	141	150	91	94	3.0
TRPH (oil & grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

QC REPORT FOR EPA 8010/8020/EDB

Date: 10/23/97-10/24/97

Matrix: WATER

Analyte	Concentration (ug/L)				% Recovery		
	Sample #(81954)	MS	MSD	Amount Spiked	MS	MSD	RPD
1,1-DCE	0.0	9.7	8.6	10.0	97	86	12.0
Trichloroethene	0.0	8.8	8.2	10.0	88	82	7.1
EDB	0.0	8.2	8.6	10.0	82	86	4.8
Chlorobenzene	0.0	9.2	9.2	10.0	92	92	0.0
Benzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toluene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chlorobz (PID)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

PAGE 1

McCAMPBELL ANALYTICAL
110 2ND AVE. SOUTH, #D7
PACHECO, CA 94553

REPORT DATE: 10/29/97

DATE(S) SAMPLED: 10/19/97

DATE RECEIVED: 10/21/97

ATTN: EDWARD HAMILTON
CLIENT PROJ. ID: 1G-705-2/9689
CLIENT PROJ. NAME: EMERYVILLE

AEN WORK ORDER: 9710258

PROJECT SUMMARY:

On October 21, 1997, this laboratory received 1 water sample(s).

Client requested sample(s) be analyzed for chemical parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.


Larry Klein
Laboratory Director

McCAMPBELL ANALYTICAL

SAMPLE ID: MW-1
 AEN LAB NO: 9710258-01
 AEN WORK ORDER: 9710258
 CLIENT PROJ. ID: 1G-705-2/9689

DATE SAMPLED: 10/19/97
 DATE RECEIVED: 10/21/97
 REPORT DATE: 10/29/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Extraction for BNAs	EPA 3520	-		Extrn Date	10/21/97
EPA 8270B - Water Matrix	EPA 8270B				
Acenaphthene	83-32-9	ND	10	ug/L	10/23/97
Acenaphthylene	208-96-8	ND	10	ug/L	10/23/97
Anthracene	120-12-7	ND	10	ug/L	10/23/97
Benzidine	92-87-5	ND	50	ug/L	10/23/97
Benzoic Acid	65-85-0	ND	50	ug/L	10/23/97
Benzo(a)anthracene	56-55-3	ND	10	ug/L	10/23/97
Benzo(b)fluoranthene	205-99-2	ND	10	ug/L	10/23/97
Benzo(k)fluoranthene	207-08-9	ND	10	ug/L	10/23/97
Benzo(g,h,i)perylene	191-24-2	ND	10	ug/L	10/23/97
Benzo(a)pyrene	50-32-8	ND	10	ug/L	10/23/97
Benzyl Alcohol	100-51-6	ND	20	ug/L	10/23/97
Bis(2-chloroethoxy)methane	111-91-1	ND	10	ug/L	10/23/97
Bis(2-chloroethyl) Ether	111-44-4	ND	10	ug/L	10/23/97
Bis(2-chloroisopropyl) Ether	108-60-1	ND	10	ug/L	10/23/97
Bis(2-ethylhexyl) Phthalate	117-81-7	ND	10	ug/L	10/23/97
4-Bromophenyl Phenyl Ether	101-55-3	ND	10	ug/L	10/23/97
Butylbenzyl Phthalate	85-68-7	ND	10	ug/L	10/23/97
4-Chloroaniline	106-47-8	ND	20	ug/L	10/23/97
2-Chloronaphthalene	91-58-7	ND	10	ug/L	10/23/97
4-Chlorophenyl Phenyl Ether	7005-72-3	ND	10	ug/L	10/23/97
Chrysene	218-01-9	ND	10	ug/L	10/23/97
Dibenzo(a,h)anthracene	53-70-3	ND	10	ug/L	10/23/97
Dibenzofuran	132-64-9	ND	10	ug/L	10/23/97
Di-n-butyl Phthalate	84-74-2	ND	10	ug/L	10/23/97
1,2-Dichlorobenzene	95-50-1	ND	10	ug/L	10/23/97
1,3-Dichlorobenzene	541-73-1	ND	10	ug/L	10/23/97
1,4-Dichlorobenzene	106-46-7	ND	10	ug/L	10/23/97
3,3'-Dichlorobenzidine	91-94-1	ND	20	ug/L	10/23/97
Diethyl Phthalate	84-66-2	ND	10	ug/L	10/23/97
Dimethyl Phthalate	131-11-3	ND	10	ug/L	10/23/97
2,4-Dinitrotoluene	121-14-2	ND	10	ug/L	10/23/97
2,6-Dinitrotoluene	606-20-2	ND	10	ug/L	10/23/97
Di-n-octyl Phthalate	117-84-0	ND	10	ug/L	10/23/97
Fluoranthene	206-44-0	ND	10	ug/L	10/23/97
Fluorene	86-73-7	ND	10	ug/L	10/23/97
Hexachlorobenzene	118-74-1	ND	10	ug/L	10/23/97
Hexachlorobutadiene	87-68-3	ND	10	ug/L	10/23/97
Hexachlorocyclopentadiene	77-47-4	ND	10	ug/L	10/23/97
Hexachloroethane	67-72-1	ND	10	ug/L	10/23/97

McCAMPBELL ANALYTICAL

SAMPLE ID: MW-1
 AEN LAB NO: 9710258-01
 AEN WORK ORDER: 9710258
 CLIENT PROJ. ID: 1G-705-2/9689

DATE SAMPLED: 10/19/97
 DATE RECEIVED: 10/21/97
 REPORT DATE: 10/29/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
Indeno(1,2,3-cd)pyrene	193-39-5	ND	10	ug/L	10/23/97
Isophorone	78-59-1	ND	10	ug/L	10/23/97
2-Methylnaphthalene	91-57-6	ND	10	ug/L	10/23/97
Naphthalene	91-20-3	ND	10	ug/L	10/23/97
2-Nitroaniline	88-74-4	ND	50	ug/L	10/23/97
3-Nitroaniline	99-09-2	ND	50	ug/L	10/23/97
4-Nitroaniline	100-01-6	ND	50	ug/L	10/23/97
Nitrobenzene	98-95-3	ND	10	ug/L	10/23/97
N-Nitrosodiphenylamine	86-30-6	ND	10	ug/L	10/23/97
N-Nitrosodi-n-propylamine	621-64-7	ND	10	ug/L	10/23/97
Phenanthrene	85-01-8	ND	10	ug/L	10/23/97
Pyrene	129-00-0	ND	10	ug/L	10/23/97
1,2,4-Trichlorobenzene	120-82-1	ND	10	ug/L	10/23/97
4-Chloro-3-methylphenol	59-50-7	ND	10	ug/L	10/23/97
2-Chlorophenol	95-57-8	ND	10	ug/L	10/23/97
2,4-Dichlorophenol	120-83-2	ND	10	ug/L	10/23/97
2,4-Dimethylphenol	105-67-9	ND	10	ug/L	10/23/97
4,6-Dinitro-2-methylphenol	534-52-1	ND	50	ug/L	10/23/97
2,4-Dinitrophenol	51-28-5	ND	50	ug/L	10/23/97
2-Methylphenol	95-48-7	ND	10	ug/L	10/23/97
4-Methylphenol	106-44-5	ND	10	ug/L	10/23/97
2-Nitrophenol	88-75-5	ND	10	ug/L	10/23/97
4-Nitrophenol	100-02-7	ND	50	ug/L	10/23/97
Pentachlorophenol	87-86-5	ND	50	ug/L	10/23/97
Phenol	108-95-2	ND	10	ug/L	10/23/97
2,4,5-Trichlorophenol	95-95-4	ND	10	ug/L	10/23/97
2,4,6-Trichlorophenol	88-06-2	ND	10	ug/L	10/23/97

ND = Not detected at or above the reporting limit
 * = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9710258
CLIENT PROJECT ID: 1G-705-2/9689

Quality Control and Project Summary

Recovery values for 1,2,4-trichlorobenzene in the LCS and LCS duplicate were above control limits, as was pyrene in the LCS duplicate. RPD values were within control limits. Sample results were all ND.

All other laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spikes(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analyses.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behaviour, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrument performance.

D: Surrogates diluted out.

I: Interference.

!: Indicates result outside of established laboratory QC limits.

WORK ORDER: 9710258

QUALITY CONTROL REPORT

PAGE QR-2

ANALYSIS: Semi-Volatile Organics

MATRIX: Water

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank
 INSTRUMENT: HP-5890 for Semi-volatiles
 UNITS: ug/L
 METHOD: EPA 8270B

LAB ID: BLNK 1021
 PREPARED: 10/21/97
 ANALYZED: 10/23/97

INSTR RUN: GCMS10\971021000000/2/
 BATCH ID: BNAW102197
 DILUTION: 1.00

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
2-Fluorophenol (surr)	64.4			100	64.4	42	110		
Phenol-d5 (surr)	67.0			100	67.0	40	122		
Nitrobenzene-d5 (surr)	67.1			100	67.1	46	109		
2-Fluorobiphenyl (surr)	69.5			100	69.5	41	140		
2,4,6-Tribromophenol (surr)	75.1			100	75.1	46	116		
Terphenyl-d14 (surr)	92.9			100	92.9	35	165		
Phenol	ND		10						
2-Chlorophenol	ND		10						
1,4-Dichlorobenzene	ND		10						
N-Nitrosodi-n-propylamine	ND		10						
1,2,4-Trichlorobenzene	ND		10						
4-Chloro-3-methylphenol	ND		10						
Acenaphthene	ND		10						
4-Nitrophenol	ND		50						
2,4-Dinitrotoluene	ND		10						
Pentachlorophenol	ND		50						
Pyrene	ND		10						
Acenaphthylene	ND		10						
Anthracene	ND		10						
Benzidine	ND		50						
Benzoic Acid	ND		50						
Benzo(a)anthracene	ND		10						
Benzo(b)fluoranthene	ND		10						
Benzo(k)fluoranthene	ND		10						
Benzo(g,h,i)perylene	ND		10						
Benzo(a)pyrene	ND		10						
Benzyl Alcohol	ND		20						
Bis(2-chloroethoxy)methane	ND		10						
Bis(2-chloroethyl) Ether	ND		10						
Bis(2-chloroisopropyl) Eth	ND		10						
Bis(2-ethylhexyl) Phthalat	ND		10						
4-Bromophenyl Phenyl Ether	ND		10						
Butylbenzyl Phthalate	ND		10						
4-Chloroaniline	ND		20						
2-Chloronaphthalene	ND		10						
4-Chlorophenyl Phenyl Ethe	ND		10						
Chrysene	ND		10						
Dibenzo(a,h)anthracene	ND		10						
Dibenzofuran	ND		10						
Di-n-butyl Phthalate	ND		10						
1,2-Dichlorobenzene	ND		10						
1,3-Dichlorobenzene	ND		10						
3,3'-Dichlorobenzidine	ND		20						
Diethyl Phthalate	ND		10						
Dimethyl Phthalate	ND		10						
2,6-Dinitrotoluene	ND		10						
Di-n-octyl Phthalate	ND		10						
1,2-Diphenylhydrazine	ND		10						
Fluoranthene	ND		10						
Fluorene	ND		10						
Hexachlorobenzene	ND		10						
Hexachlorobutadiene	ND		10						
Hexachlorocyclopentadiene	ND		10						
Hexachloroethane	ND		10						
Indeno(1,2,3-cd)pyrene	ND		10						
Isophorone	ND		10						
2-Methylnaphthalene	ND		10						
Naphthalene	ND		10						
2-Nitroaniline	ND		50						
3-Nitroaniline	ND		50						
4-Nitroaniline	ND		50						
Nitrobenzene	ND		10						
N-Nitrosodimethylamine	ND		10						
N-Nitrosodiphenylamine	ND		10						

WORK ORDER: 9710258

QUALITY CONTROL REPORT

PAGE QR-3

ANALYSIS: Semi-Volatile Organics

MATRIX: water

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank		LAB ID: BLNK 1021		INSTR RUN: GCMS10\971021000000/2/				
INSTRUMENT: HP-5890 for Semi-volatiles		PREPARED: 10/21/97		BATCH ID: BNAW102197				
UNITS: ug/L		ANALYZED: 10/23/97		DILUTION: 1.00				
METHOD: EPA 8270B								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW HIGH	RPD (%)	RPD LIMIT (%)
Phenanthrene	ND		10					
2,4-Dichloropheno]	ND		10					
2,4-Dimethylpheno]	ND		10					
4,6-Dinitro-2-methylpheno]	ND		50					
2,4-Dinitrophenol	ND		50					
2-Methylpheno]	ND		10					
4-Methylpheno]	ND		10					
2-Nitrophenol	ND		10					
2,4,5-Trichloropheno]	ND		10					
2,4,6-Trichloropheno]	ND		10					

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Laboratory Control Spike		LAB ID: LCD 1021		INSTR RUN: GCMS10\971021000000/4/2				
INSTRUMENT: HP-5890 for Semi-volatiles		PREPARED: 10/21/97		BATCH ID: BNAW102197				
UNITS: ug/L		ANALYZED: 10/23/97		DILUTION: 1.00				
METHOD: EPA 8270B								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW HIGH	RPD (%)	RPD LIMIT (%)
2-Fluoropheno] (surr)	101	64.4		100	101	42 110		
Pheno]-d5 (surr)	103	67.0		100	103	40 122		
Nitrobenzene-d5 (surr)	106	67.1		100	106	46 109		
2-Fluorobiphenyl (surr)	106	69.5		100	106	41 140		
2,4,6-Tribromopheno] (surr)	103	75.1		100	103	46 116		
Terphenyl]-d14 (surr)	122	92.9		100	122	35 165		
Pheno]	93.2	ND	10	100	93.2	44 94		
2-Chloropheno]	102	ND	10	100	102	52 111		
1,4-Dichlorobenzene	109	ND	10	100	109	54 116		
N-Nitrosodi-n-propylamine	91.7	ND	10	100	91.7	48 141		
1,2,4-Trichlorobenzene	117	ND	10	100	117 !	57 107		
4-Chloro-3-methylpheno]	98.2	ND	10	100	98.2	54 113		
Acenaphthene	108	ND	10	100	108	60 114		
4-Nitrophenol	76.9	ND	50	100	76.9	22 119		
2,4-Dinitrotoluene	114	ND	10	100	114	43 130		
Pentachloropheno]	85.5	ND	50	100	85.5	38 110		
Pyrene	123	ND	10	100	123 !	32 121		

SAMPLE TYPE: Laboratory Control Spike		LAB ID: LCS 1021		INSTR RUN: GCMS10\971021000000/3/2				
INSTRUMENT: HP-5890 for Semi-volatiles		PREPARED: 10/21/97		BATCH ID: BNAW102197				
UNITS: ug/L		ANALYZED: 10/23/97		DILUTION: 1.00				
METHOD: EPA 8270B								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW HIGH	RPD (%)	RPD LIMIT (%)
2-Fluoropheno] (surr)	100	64.4		100	100	42 110		
Pheno]-d5 (surr)	104	67.0		100	104	40 122		
Nitrobenzene-d5 (surr)	103	67.1		100	103	46 109		
2-Fluorobiphenyl (surr)	107	69.5		100	107	41 140		
2,4,6-Tribromopheno] (surr)	105	75.1		100	105	46 116		
Terphenyl]-d14 (surr)	121	92.9		100	121	35 165		
Pheno]	90.5	ND	10	100	90.5	44 94		
2-Chloropheno]	98.5	ND	10	100	98.5	52 111		
1,4-Dichlorobenzene	104	ND	10	100	104	54 116		
N-Nitrosodi-n-propylamine	90.8	ND	10	100	90.8	48 141		
1,2,4-Trichlorobenzene	110	ND	10	100	110 !	57 107		
4-Chloro-3-methylpheno]	94.2	ND	10	100	94.2	54 113		
Acenaphthene	103	ND	10	100	103	60 114		
4-Nitrophenol	75.9	ND	50	100	75.9	22 119		
2,4-Dinitrotoluene	111	ND	10	100	111	43 130		
Pentachloropheno]	81.4	ND	50	100	81.4	38 110		

WORK ORDER: 9710258

QUALITY CONTROL REPORT

PAGE QR-4

ANALYSIS: Semi-Volatile Organics

MATRIX: Water

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Laboratory Control Spike		LAB ID: LCS 1021		INSTR RUN: GCMS10\971021000000/3/2				
INSTRUMENT: HP-5890 for Semi-volatiles		PREPARED: 10/21/97		BATCH ID: BNAW102197				
UNITS: ug/L		ANALYZED: 10/23/97		DILUTION: 1.00				
METHOD: EPA 8270B								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
Pyrene	118	ND	10	100	118	LOW 32 HIGH 121		

LABORATORY CONTROL DUPLICATES

SAMPLE TYPE: Laboratory Control Sample Duplicate		LAB ID: LCR 1021		INSTR RUN: GCMS10\971021000000/5/3				
INSTRUMENT: HP-5890 for Semi-volatiles		PREPARED: 10/21/97		BATCH ID: BNAW102197				
UNITS: ug/L		ANALYZED: 10/23/97		DILUTION: 1.00				
METHOD: EPA 8270B								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
2-Fluorophenol (surr)	101	100		100	101	LOW 42 HIGH 110		
Phenol-d5 (surr)	103	104		100	103	40 122		
Nitrobenzene-d5 (surr)	106	103		100	106	46 109		
2-Fluorobiphenyl (surr)	106	107		100	106	41 140		
2,4,6-Tribromophenol (surr)	103	105		100	103	46 116		
Terphenyl-d14 (surr)	122	121		100	122	35 165		
Phenol	93.2	90.5	10	100			2.94	40
2-Chlorophenol	102	98.5	10	100			3.49	40
1,4-Dichlorobenzene	109	104	10	100			4.69	30
N-Nitrosodi-n-propylamine	91.7	90.8	10	100			0.986	30
1,2,4-Trichlorobenzene	117	110	10	100			6.17	30
4-Chloro-3-methylphenol	98.2	94.2	10	100			4.16	30
Acenaphthene	108	103	10	100			4.74	30
4-Nitrophenol	76.9	75.9	50	100			1.31	40
2,4-Dinitrotoluene	114	111	10	100			2.67	40
Pentachlorophenol	85.5	81.4	50	100			4.91	30
Pyrene	123	118	10	100			4.15	30

SAMPLE SURROGATES

SAMPLE TYPE: Sample-Client		LAB ID: 9710258-01A		INSTR RUN: GCMS10\971021000000/1/				
INSTRUMENT: HP-5890 for Semi-volatiles		PREPARED: 10/21/97		BATCH ID: BNAW102197				
UNITS: ug/L		ANALYZED: 10/23/97		DILUTION: 1.00				
METHOD: EPA 8270B								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
2-Fluorophenol (surr)	93.2			100	93.2	LOW 42 HIGH 110		
Phenol-d5 (surr)	98.6			100	98.6	40 122		
Nitrobenzene-d5 (surr)	96.1			100	96.1	46 109		
2-Fluorobiphenyl (surr)	101			100	101	41 140		
2,4,6-Tribromophenol (surr)	102			100	102	46 116		
Terphenyl-d14 (surr)	115			100	115	35 165		

----- End of Quality Control Report -----

McCAMPBELL ANALYTICAL

110 2nd AVENUE, # D7

PACHECO, CA 94553

(510) 798-1620

FAX (510) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME: RUSH 24 HOUR 48 HOUR 5 DAY

REPORT TO: *Steve Bittman* BILL TO: *International Geologic*

COMPANY: *International Geologic*

2831 Sylhowe Rd

Oakland CA 94602

TELE: *530-8751*

FAX #: *530-8794*

PROJECT NUMBER: *705-2*

PROJECT NAME:

PROJECT LOCATION: *Emeryville*

SAMPLER SIGNATURE: *Steve Bittman*

SAMPLE ID	LOCATION	SAMPLING		# CONTAINERS	TYPE CONTAINERS	MATRIX					METHOD PRESERVED			ANALYSIS REQUEST	OTHER		
		DATE	TIME			WATER	SOIL	AIR	SLUDGE	OTHER	HCL	HNO3	OTHER (L)				
<i>S-5 1/2-SB1</i>		<i>10-10-97</i>		<i>1</i>	<i>Brass</i>		<i>X</i>						<i>X</i>	<i>X</i>	<i>X</i>		
<i>S-7-SB1</i>		<i>10-10-97</i>		<i>1</i>	<i>Brass</i>		<i>X</i>						<i>X</i>	<i>X</i>	<i>X</i>		
<i>S-11 1/2 SB1</i>		<i>10-10-97</i>		<i>1</i>	<i>Brass</i>		<i>X</i>						<i>X</i>	<i>X</i>	<i>X</i>		

3TEX & TPH as Gasoline (602/8020 & 8013) / MTBE

TMP as Diesel (8013)

Total Petroleum DI & Grease (5520 ISF/5580 BAF)

Total Petroleum Hydrocarbons (AHL)

EPA 601/601D

EPA 602/8020

EPA 608/8080

EPA 608/8080 - PCBs Only

EPA 624/8240/8240

EPA 625/8250

CAM - 17 Metals

EPA - Priority Pollutant Metals

LEAD (7248/7421/239.2/6010)

ORGANIC LEAD

REI - 174

ICE/CHECK GOOD CONDITION HEAD SPACE ABSENT PRESERVATION APPROPRIATE CONTAINERS VOAS/O&G/METALS/OTHER

RELINQUISHED BY: *Steve Bittman*

DATE: *10-12-97* TIME: *6:00pm*

RECEIVED BY: *E. Kline*

RELINQUISHED BY: *E. Kline*

DATE: *10-13-97* TIME: *4:45*

RECEIVED BY: *D. Louie 743*

RELINQUISHED BY: *D. Louie 743*

DATE: *10/14* TIME: *7:30am*

RECEIVED BY LABORATORY: *Milenic MAE 10/14 10:30am*

REMARKS: ** 7:30 AM * 601*
10-14-97 Janie Filla

Janie Filla # 601 10/14/97 10:30 AM

McCAMPBELL ANALYTICAL

110 2nd AVENUE, # D7
PACHECO, CA 94553

RISA

(510) 798-1620

FAX (510) 798-1622

REPORT TO: ED HAMILTON

BILL TO: MAI

PROJECT NUMBER: 9689

PROJECT NAME: IG-705-2

PROJECT LOCATION: Emeryville

9110258

CHAIN OF CUSTODY RECORD

TURN AROUND TIME: RUSH 24 HOUR 48 HOUR 5 DAY ROUTE

ANALYSIS REQUEST

OTHER

EPA 801/801D	EPA 802/802D	EPA 808/808D	EPA 808/808D - PCBs Only	EPA 824/824D/826D	EPA 825/827D 827D	CAM - 17 Metals	EPA - Priority Pollutant Metals	LUFT Metals	LEAD (7240/7421/239.2/6010)	ORGANIC LEAD	RCI										
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COMMENTS

82074

SAMPLE ID	LOCATION	SAMPLING		# CONTAINERS	TYPE CONTAINERS	MATRIX					METHOD PRESERVED											
		DATE	TIME			WATER	SOIL	AIR	SLUDGE	OTHER	HCL	HNO3	ICE	OTHER								
MW-1	DIAB	10/19/99	3:30 pm	2	LTR	X								X								

RELINQUISHED BY: *M. Ittenie, MAI*
 RELINQUISHED BY: *Michael Ittenie*
 RELINQUISHED BY:

DATE: 10/21
 TIME: 1300
 DATE: 10/21
 TIME: 1315
 DATE:
 TIME:

RECEIVED BY: *Michael Ittenie*
 RECEIVED BY:
 RECEIVED BY LABORATORY: 10/21/99
Quia Gillespie 1315

REMARKS: Please fax results as soon as available.