

BLYMYER & SONS engineers, inc.

September 16, 1986
BSE Job No. 8648

RECEIVED
SEP 17 1986

Mr. Ted Gerow
ALAMEDA COUNTY DIVISION
OF ENVIRONMENTAL HEALTH
470-27th Street #324
Oakland, CA. 94612

**ENVIRONMENTAL HEALTH
ADMINISTRATION**

SUBJECT: PIE-NATIONWIDE
 SOIL CLEANUP
 EMERYVILLE, CALIFORNIA

Dear Mr. Gerow:

Please find enclosed the results of a series of soil investigations performed at the above-mentioned facility. I apologize for the lateness of the submission, as we were waiting for one contractor to provide us with the final copy of their results.


I have also included a copy of Groundwater Technology's proposed cleanup plan. We would like to get started on this work as soon as possible, because as I have mentioned in our telephone conversations the property is being sold, and the new owner would like the site cleaned up as much as possible before he takes title. We feel this plan will be effective in terms of cost and results and is the best remedial action for this site.

Our remedial action plan for groundwater will be submitted shortly.

I will be contacting you in the next few days to discuss your reactions to the plan. If you have any questions beforehand, please call. Again, I am sorry for the delay in getting you the results.

Cordially yours,

BLYMYER & SONS ENGINEERS, INC.



Chris Falbo

CF/ds

Attachments

cc: Mr. Bob Weaver -PIE NATIONWIDE
 Mr. Alan McKay -McKAY & ASSOCIATES
 Ms. Jan Jacobsen -GROUNDWATER TECHNOLOGY
 Mr. Dale Boyer -REGIONAL WATER QUALITY CONTROL BOARD
 Dr. Paul Williams -DEPARTMENT OF HEALTH SERVICES

35E 3648



GROUNDWATER TECHNOLOGY

A DIVISION OF OIL RECOVERY SYSTEMS, INC

5047 Clayton Road, Concord, CA 94521, (415) 671-2387, telex 358867

September 2, 1986

Mr. Chris Falbo
Blymyer & Sons Engineers, Inc.
1829 Clement Ave.
Alameda, CA 94501

Re: P.I.E./Emeryville Soil
Remediation

Dear Chris,

INTRODUCTION

Groundwater Technology, Inc. (GTI) is pleased to respond to your request for bids regarding the implementation of a remedial action program for soil contamination at the P.I.E./Nationwide site in Emeryville, California. It is our understanding that you are requesting remedial action for the soils only, and therefore, groundwater treatment is not discussed as part of this proposed work scope.

The soil clean-up objectives as described in the August 20, 1986 request for bids is to "restore the site to contamination levels acceptable to all county and state regulatory agencies". Based upon this clean-up objective and consideration of the site conditions, GTI has developed the first phase of a remedial action plan which provides for the excavation of the contaminated soils with hydrocarbon concentrations greater than 1000 ppm (part per million). The excavated material will be stored on site for active aeration via venting and land farming through modified Enhanced Natural Degradation (ENDTM). Upon attaining acceptable levels, the soil will be backfilled into the excavated pits.

PROPOSED SCOPE OF WORK

The proposed scope of work would involve soil excavation at two separate locations on the property. One rectangular (Pit 1) would be excavated around the site of the former waste oil tank located to the east of the Service Building, and one pit (Pit 2) would be excavated around the site of the former fuel tanks west of the Service Building. Pit 1 would be approximately 45 ft. square and approximately 11 feet deep (to the water table). Pit 2 would consist of two rectangular and one triangular shaped excavations. One rectangle would be approximately 25 ft. x 40 ft. in areal extent and the other would be approximately 25 ft. x 65 ft. The triangular portion will extend to the west toward the fence line. All portions of the pit would be excavated to the water table. Additional material may

Mr. Chris Falbo

also be removed from the subsurface if contamination warrants it. If possible, the soils will be separated into piles of greater and lesser contamination. Field screening will occur based upon observation of contaminant saturation and photo-ionization detector (PID) levels. Composite soil samples of the resultant soil piles will be taken for analysis of total fuel hydrocarbons to provide baseline data.

The excavated soil will be stored on the site to the east of the railroad tracks to form a mound six feet deep and approximately 90 feet square (the dimensions may be modified based upon available space). If possible, the soil contaminated with gasoline components will be placed in a separate mound due to the difference in regulations governing on-site aeration.

The treatment proposed for degradation of the hydrocarbon contaminants within the excavated soil consists of active aeration and above-ground Enhanced Natural Degradation (ENDTM). The specifics of the treatment programs and construction details are presented in the following sections.

AERATION

The Bay Area Air Quality Management District recently adopted a regulation regarding the on-site aeration of soils contaminated by organic chemicals or petroleum chemicals (Regulation 8, Rule 40). This regulation stipulates allowable rates of uncontrolled aeration, exemptions from the rule and controlled aeration criteria. These criteria were used in the development of this on-site aeration plan.

The majority of subsurface contamination ~~is due~~ to diesel fuel which has a boiling point range of 356°F - 464°F. The soils contaminated with diesel fuel are thus exempt from the rule per section 8-40-113, EXEMPTION Non-volatile Hydrocarbons because their boiling point is greater than 302°F. The soils in the vicinity of the excavated gasoline tank pit, however, are subjected to this regulation and will thus be aerated accordingly. L. H. G.

Aeration Mound Construction

Two feet of contaminated soil will be spread out initially. Four two-inch PVC slotted vent pipes will be placed on top of this soil, and four feet of soil will then be placed over the

vent pipes. The vent pipes will be approximately 18 feet apart and will extend the length of the mounds. A Rotron blower will be attached to the vent pipes to create a vacuum and thus induce movement of air through the soil pile which will increase volatilization of the hydrocarbons. Although diesel is comprised of the heavier, less volatile hydrocarbons, induced aeration will, none the less, expedite removal of the adsorbed contaminants (contamination phase present within the soil). The gasoline contaminants present within a portion of the soil will be effectively reduced by the venting program.

The section of the mound containing the gasoline contaminated soil will be covered with a tarp. In addition, a Carbitrol™ vapor cannister will be utilized to provide for controlled aeration as per section 8-40-302 due to the presence of gasoline contaminants. This section allows for aeration at rates exceeding the stated limitations of section 8-40-301 "provided emissions of organic compounds to the atmosphere are reduced by at least 90% by weight". The reduction will be verified by retrieving one air influent sample and one air effluent sample from the Carbitrol can. The samples will be analyzed for total petroleum hydrocarbons by the Groundwater Technology, Inc. Environmental Laboratory in Greenville, New Hampshire. Subsequent to system start up, the air influent and effluent will be monitored with a field photo-ionization detector (HNU PID 101).

ABOVE GROUND ENHANCED NATURAL DEGRADATION (END™)

The existence of naturally occurring microbes within the subsurface which degrade hydrocarbon contaminants is well documented. It has also been well documented that stimulation of the microbes by adding oxygen and nutrients (i.e., phosphates) creates population booms. The increase in population in turn increases the degradation of hydrocarbons as the microbes seek out a food source. The technique of enhancing the naturally occurring degradation process has been used by GTI at sites across the country and has been coined with the acronym END™.

This same process can and has been used for above ground soil remediation. This process, which is commonly referred to as land-farming, is the second aspect of GTI's proposed remedial action plan for the excavated soils at the P.I.E./Nationwide, Emeryville site. Because of the exposure of the soils to the atmosphere and the action of the vent system, an additional oxygen source is not required for land-farming. The addition of

nutrients, however, will enhance the population growth of existing microbes which will result in expedited degradation of the hydrocarbon contaminants.

Groundwater Technology, Inc. proposes to implement biodegradation at the Emeryville site by adding nutrients twice a week to the soil mounds. The nutrients will be mixed with water on-site in a 500-gallon mixing tank. The resultant emulsion will then be sprayed across the top of the soil mounds by a GTI technician. A ladder and wooden planks set across the top of the soil mound will be utilized to provide access and thus ensure the nutrients are applied evenly.

JOB COMPLETION

Groundwater Technology, Inc. anticipates a reduction from the current soil contaminant levels to less than 1000 ppm to occur within six weeks. At the six week mark, soil samples will be retrieved for each 50 yd.³ of gasoline contaminated soil and each 100 yd.³ of diesel/oil contaminated soil to verify hydrocarbon concentrations.

When the soil contaminant levels are acceptable for backfilling to proceed, a GTI civil engineer will manage the operation. The soils will be backfilled into the excavated pits and compacted as necessary to meet the site requirements.

Based upon GTI's experience at similar sites in the Bay Area, a reduction of the hydrocarbon levels to below 1000 ppm should be acceptable for backfill. If the actual situation at this site varies such that a more stringent reduction is required, then GTI will provide a modification of costs to Blymyer & Sons Engineers, Inc. to proceed with the maintenance and monitoring phase of work.

PROPOSED COSTS

The following cost breakdown reflects the estimated costs associated with each phase of the proposed project. The total proposed cost estimated will be considered a Not-to-Exceed amount upon acceptance of this proposal. Billing will thus occur on a time and materials basis not to surpass the total cost estimate without prior approval from Blymyer & Sons Engineers, Inc.. Billing will occur as per the attached rate schedule which stipulates our terms and conditions.

COST ESTIMATE BREAKDOWN

<u>WORKSTEP</u>	<u>COST</u>
Excavation.....	\$15,590.00
o Sub-contractor fees.	
o Professional services.	
o Equipment, supplies.	
Vapor Vent/Nutrient Feed System Construction.....	\$10,890.00
o Soil movement.	
o Construction materials.	
o Professional services.	
o Equipment.	
Maintenance/Monitoring.....	\$11,630.00
o Nutrients.	
o Professional services.	
o Equipment rental.	
o Sampling, analyses.	
Backfill.....	<u>\$15,000.00</u>
o Sub-contractor fees.	
o Compaction analysis.	
o Professional services.	
TOTAL PROPOSED COST ESTIMATE.....	\$53,110.00

Mr. Chris Falbo
September 2, 1986
Page 6

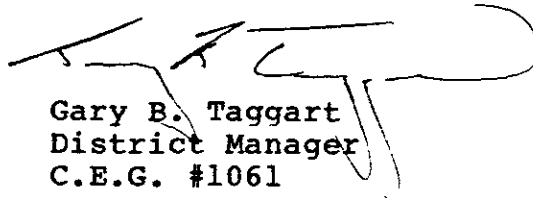
CLOSURE

Groundwater Technology, Inc. appreciates the opportunity to bid on a soil remediation program for the P.I.E./Nationwide site in Emeryville, California. If GTI can be of assistance in any subsequent phases of remediation at this site, please contact us directly at the Concord office at (415) 671-2387.

Sincerely,
Groundwater Technology, Inc.



Jan Jacobson
Project Geologist



Gary B. Taggart
District Manager
C.E.G. #1061

Steve Hill



GROUNDWATER TECHNOLOGY

A DIVISION OF OIL RECOVERY SYSTEMS, INC.

5047 Clayton Road, Concord, CA 94521, (415) 671-2387, telex 358867

BSE 8848
DUD

September 5, 1986

Project Number 20-8124

DB

(N)

Mr. Chris Falbo
Blymyer and Sons Engineering, Inc.
1829 Clement Ave.
Alameda, CA 94501

ALII

Dear Mr. Falbo:

Groundwater Technology, Inc. was retained on July 30, 1986, to perform an assessment of underground fuel hydrocarbon contamination at the PIE Nationwide property. The site is located at 5500 Eastshore Freeway Emeryville, California (See *Alameda* Figure 1 for site location). This letter presents the results of our assessment along with recommendations for further action.

SCOPE OF WORK

The subsurface assessment at the PIE Nationwide site consisted of the following work steps as per your request:

- The installation of eight soil borings adjacent to two underground tank excavation pits in order to retrieve soil and water samples for laboratory analyses. The samples were analyzed for benzene, toluene, xylene, and total fuel hydrocarbons.
- The conversion of all eight soil borings into monitor wells for the purposes of water level measurement and water quality assurance.

SOIL BORING INSTALLATION

Three soil borings were located around the waste oil tank excavation east of the service building (See Figure 2 for Site Plan). The five other soil borings were located around the larger fuel tank excavation pit just west of the service building. Each soil boring was drilled with truck mounted, 8 inch diameter, hollow stem auger equipment. Relatively undisturbed soil samples were obtained during drilling using a split spoon sampler lined with brass tubes. When groundwater was encountered, drilling stopped and initial water samples were collected after hand bailing four boring volumes. All soil samples were sealed, capped and placed in an insulated cooler with ice for delivery to an analytical laboratory.

MONITOR WELL INSTALLATION

Each monitor well was constructed using three inch or four inch diameter PVC pipe and 0.02 inch slotted well screen. Clean #3 Lapis Luster sand was placed in the annulus between the well screen and the bore hole walls to extend approximately 1 foot above the top of the screen. A surface seal consisting of bentonite and cement completed the well. Drilling and well construction logs are attached for your review.

LABORATORY RESULTS

SOIL SAMPLES

Table 1 presents the laboratory results for soil samples from the eight soil borings. The samples were analyzed for the presence of benzene, toluene, xylene and total fuel hydrocarbons as previously mentioned. The results for benzene, toluene, and xylene concentrations were not attainable, however, due to the

level of background interference encountered. The observed total fuel hydrocarbon contamination present on-site is above the San Francisco Bay Area Regional Water Control Board's action limit of 1,000 ppm (parts per million) for excavation. The highest concentration of total fuel hydrocarbons reported for the analyses on soil samples at the PIE Nationwide site was 16,000 ppm in the sample collected from 10.5 to 11.0 feet within soil boring #2. Four other soil borings had total fuel hydrocarbon contamination in excess of 1,000 ppm. Soil samples from borings #3, 4, and 5 were reported to contain hydrocarbon concentrations above the action limit of 100 ppm which warrants the installation of monitoring wells. The monitoring wells installed during this subsurface assessment, however, fulfill that requirement.

WATER SAMPLES

Table 2 presents the laboratory results for water samples from the eight soil borings. These samples were also analyzed for benzene, toluene, xylene and total fuel hydrocarbons. In addition, free product was observed during a site visit in wells 1, 3, and 5. Well #1 had approximately 0.13 feet, well #3 had approximately 0.22 feet, and well #5 had approximately 0.21 feet of free floating fuel.

CONCLUSIONS

Based on drilling and sampling results, it is evident that there is extensive soil contamination on site. The contaminant source present along the eastern area of the property (the region near the waste oil pit) is apparently diesel. Similarly, the contamination in the area north of the larger, western pit is from diesel fuel. The area south of the large pit (specifically well #8), however, is contaminated with large amounts of benzene. This indicates the presence of gasoline. It was

reported by Blymyer and Son's Engineers, Inc. that a gasoline tank was removed from this area in the 1970's. This tank was the probable source for the gasoline contamination around well #8.

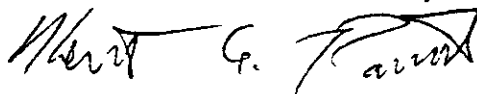
RECOMMENDATIONS

Due to future land development plans for the PIE Nationwide property and the level of contamination reported within the soil surrounding both excavations, Groundwater Technology recommends that soil excavation with on-site treatment take place. When appropriate contamination levels are attained, backfilling of the excavated area could occur. We also recommend that the eight monitor wells be developed so that silt free samples may be taken for analysis of dissolved hydrocarbons and accurate monitoring of free product thickness.

In addition, we recommend that further assessment be undertaken along the eastern end of the property as no borings were performed in this area. Upon completion of the assessment, Groundwater Technology will develop recommendations addressing the possibility of free product recovery and groundwater treatment. The concentrations of dissolved hydrocarbons in several water samples from various monitoring wells are currently above the state's drinking water criteria. Clean-up action due to dissolved contamination, however, is determined by local regulatory agencies on a site by site basis based upon site sensitivity. The presence of free product greater than .25-inch normally requires removal as per the current Bay Area regulations and will therefore be addressed accordingly.

If you have any questions regarding the contents of this letter-report please feel free to contact me at our Concord office (415) 671-2387.

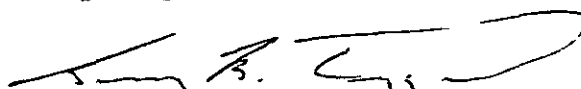
Sincerely,
GROUNDWATER TECHNOLOGY, INC.



Kent E. Parrish
Geologist



Jan Jacobson
Hydrogeologist



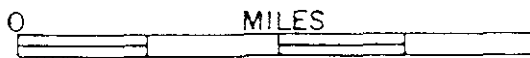
Gary B. Taggart
District Manager
Certified Engineering
Geologist No. 1061

KP/tb

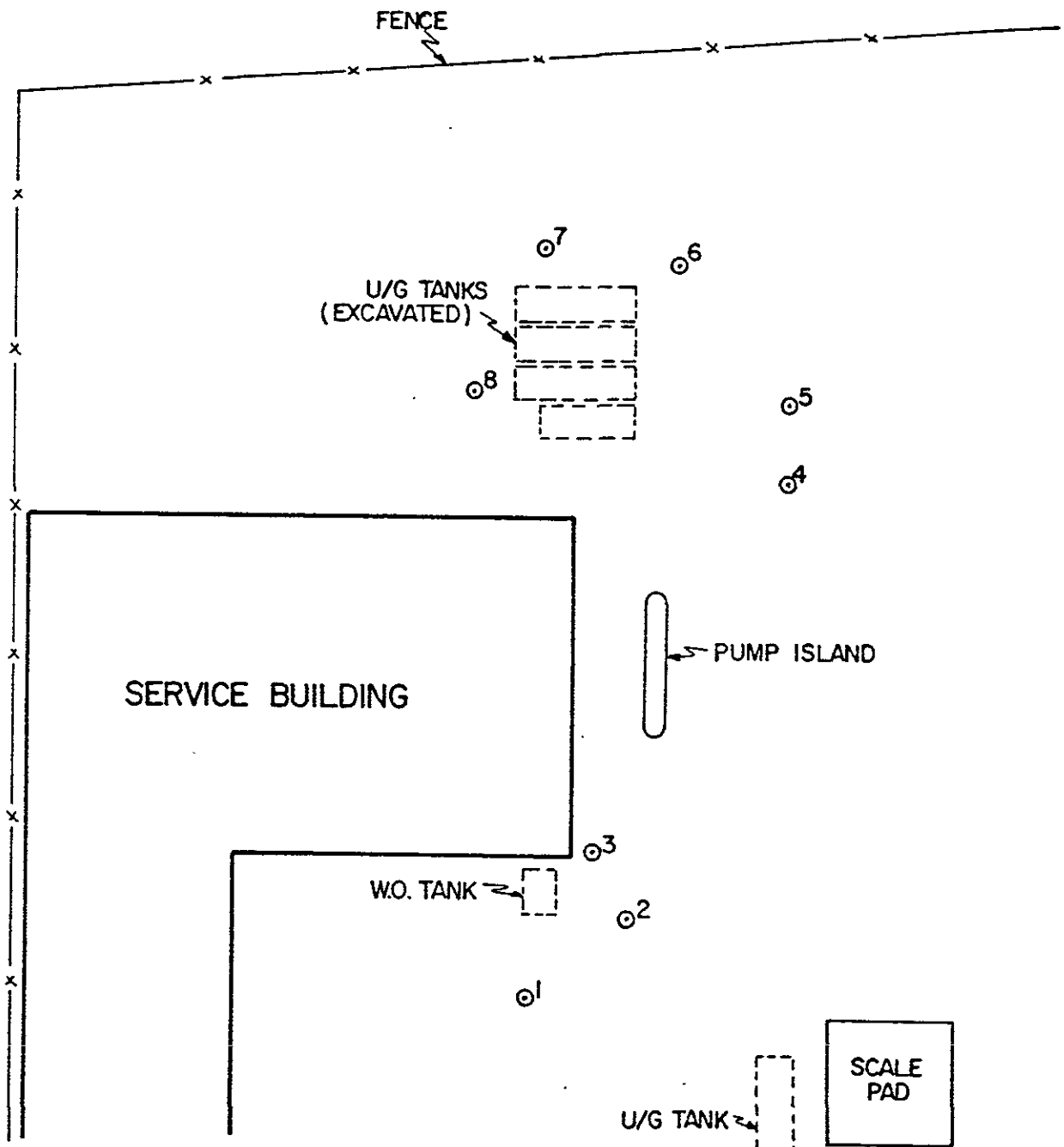


SITE LOCATION MAP

PIE NATIONWIDE
EMERYVILLE, CALIFORNIA



GROUNDWATER
TECHNOLOGY



LEGEND

⊙ MONITORING WELL

FIGURE 2
SITE PLAN



0 FEET 40

PIE NATIONWIDE
EMERYVILLE, CALIFORNIA



GROUNDWATER
TECHNOLOGY

TABLE 1
SOIL ANALYSES RESULTS

SOIL BORING	SAMPLE NUMBER	DEPTH (ft.)	TOTAL FUEL HYDROCARBON (ppm)
1	1	5.5 - 6.0	11,000
1	2	10.0-10.5	2,500
2	1	5.5 - 6.0	26
2	2	10.5-11.0	16,000
2	3	18.0-18.5	30
3	1	5.5 - 6.0	930
4	1	5.5 - 6.0	ND
4	2	10.5-11.0	680
4	3	15.5-16.0	ND
5	1	5.5 - 6.0	110
5	2	10.5-11.0	ND
6	1	5.5 - 6.0	6,800
6	2	10.5-11.0	ND
6	3	15.5-16.0	ND
7	1	5.5 - 6.0	110
7	2	10.5-11.0	1,400
7	3	15.5-16.0	ND
8	1	7.5 - 8.0	3,800

ND = None Detected at 100 ppm.

TABLE 2
WATER ANALYSES RESULTS

SOIL BORING	BENZENE (ppb)	TOLUENE (ppb)	TOTAL XYLENE (ppb)	TOTAL FUEL HYDROCARBON (ppm)
1	2,500	44	490	3,200
2	260	<2	8	16
3	870	4	34	20
4	<2	7	<2	4
5	42	<2	<2	<1
6	<2	<2	5	<1
7	480	40	330	13
8	77,000	56	400	600
Pit TR 1	320	<2	20	2,000
Pit TR 3	33	<2	200	NA

NA = Not Analyzed



GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

SOIL BORING GT- 1

Drilling Log

Project Blymver/PIE Enerville Owner PIE Nationwide
 Location Enerville Project Number 20-8124
 Date Drilled 8/4/86 Total Depth of Hole 10.5 ft. Diameter 8 in.
 Surface Elevation _____ Water Level, Initial _____ 24-hrs. _____
 Screen: Dia. 4 in. Length 5 ft. Slot Size 0.02 in.
 Casing: Dia. 4 in. Length 3.5 ft. Type PVC
 Drilling Company Kvilhaug Drilling Drilling Method h.s. Auger
 Driller Chris Log by Kent Parrish

Sketch Map

*Well constructed 8/7/86

Notes Natural gravel pack to 8 ft.

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0					
1					0' - 3' Light brown gravel and sand fill, moist, no odor.
2					
3					
4					
5		5.0-5.5	GT1-1		
6		5.5-6.0	20		Black to dark brown, fine gravelly sand, moist, strong product odor.
7		6.0-6.5	28		
8		8.5-9.0	10		
9		9.0-9.5			
10		9.5-10.0			
11		10.0-10.5			
12					
13					
14					
15					

8/4/86

NOTE: Samples collected for geologic description and laboratory analyses.



GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

SOIL BORING GT- 2

Drilling Log

Project Blymver/PIE Enerville Owner PIE Nationwide

Location Enerville Project Number 20-8124

Date Drilled 8/4/86 Total Depth of Hole 19 ft. Diameter 8 in.

Surface Elevation _____ Water Level, Initial _____ 24-hrs. _____

Screen: Dia. 3 in. Length 15 ft. Slot Size 0.02 in.

Casing: Dia. 3 in. Length 3 ft. Type PVC

Drilling Company Kvilhaug Drilling Drilling Method h.s. Auger

Driller Chris Log by Kent Parrish

Sketch Map

*Well constructed 8/7/86

Notes Natural gravel pack to 10 ft.

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0					Light brown gravel and sand fill.
1					
2					
3					
4			GT 2-1		
5		5.0-5.5	6		
6		5.5-6.0	6		Black to dark brown, plastic clay, minor fine gravel decreasing with depth, moist, strong product odor.
7		6.0-6.5	6		
8					
9			GT 2-2		
10		10.0-10.5	1		
11		10.5-11.0	3		
12		11.0-11.5	3		
13					
14					
15		15.0-15.5	4		
16		15.5-16.0	4		
17		16.0-16.5	5		
18		17.5-18.0	2		Dark green, fine sandy clay, saturated, product odor.
19		18.0-18.5	3		
19		18.5-19.0	3		
20					

NOTE: Samples collected for geologic descriptions and laboratory analyses.



GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

SOIL BORING GT-3

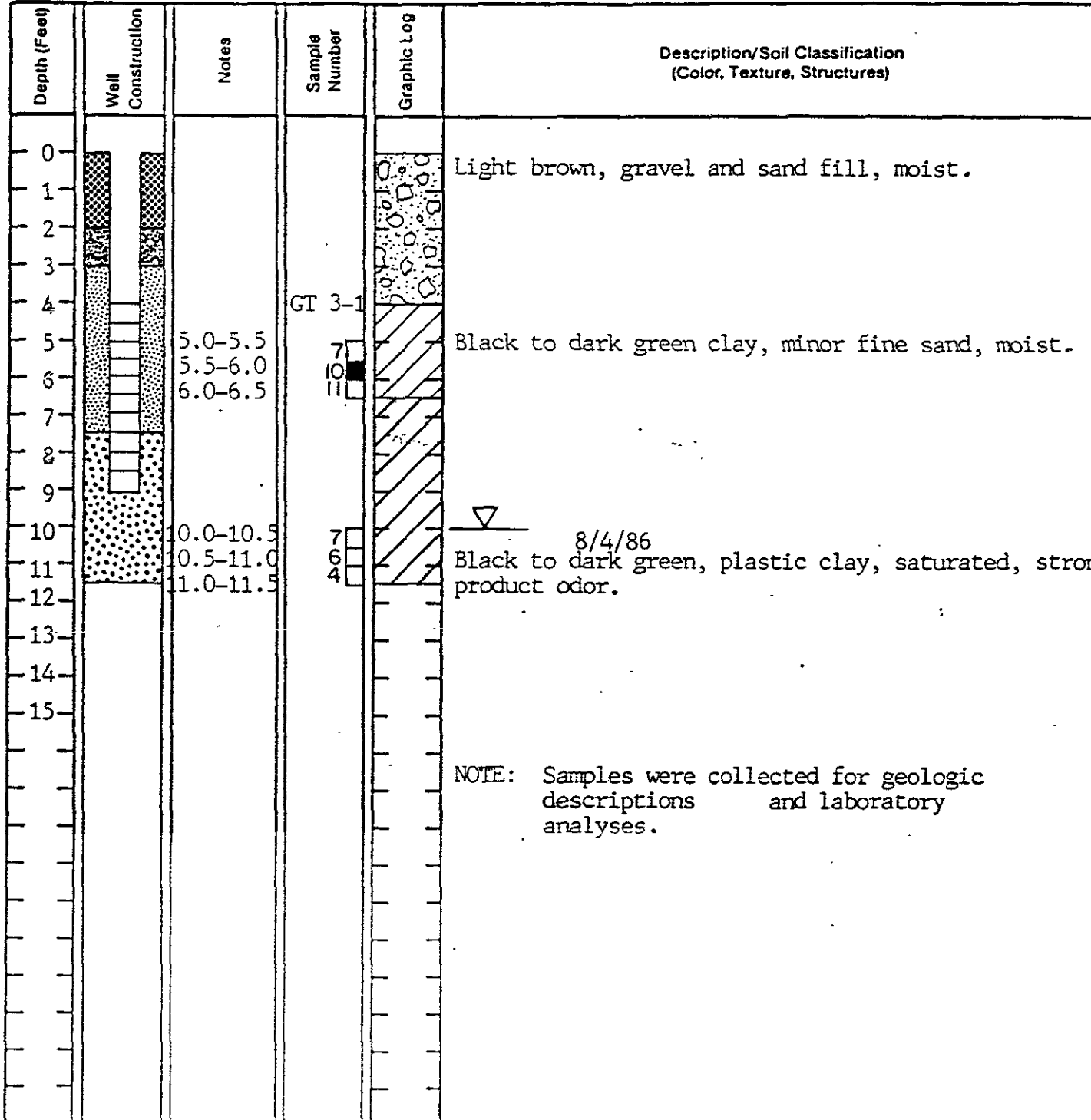
Drilling L

Project Blymver/PIE Emerville Owner PIE Nationwide
 Location Emerville Project Number 20-8124
 Date Drilled 8/4/86 Total Depth of Hole 11.5 ft Diameter 8 in.
 Surface Elevation _____ Water Level, Initial _____ 24-hrs _____
 Screen: Dia. 3 in. Length 5 ft. Slot Size 0.02 in.
 Casing: Dia. 3 in. Length 4 ft. Type PVC
 Drilling Company Kvilhaug Drilling Drilling Method h.s. Auger
 Driller Chris Log by Kent Parrish

Sketch Map

*Well constructed 8/7/86

Notes Natural gravel pack to 7.5 ft.





GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

SOIL BORING

GT- 4

Drilling Log

Project Blumver/PIE Emeryville Owner PIE Nationwide

Location Emeryville Project Number 20-8124

Date Drilled 8/4/86 Total Depth of Hole 16.5 ft Diameter 8 in.

Surface Elevation _____ Water Level, Initial _____ 24-hrs. _____

Screen: Dia. 3 in. Length 10 ft. Slot Size 0.02 in.

Casing: Dia. 3 in. Length 4.5 ft. Type PVC

Drilling Company Kvilhaug Drilling Drilling Method h.s. Auger

Driller Chris Log by Kent Parrish

Sketch Map

*Well constructed 8/7/86

Notes: ** Natural gravel pack to 10 ft.

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0					Light brown, gravel and sand fill, moist,
1					
2					
3					
4					
5		5.0-5.5	GT 4-1		Dark green, clayey, medium sand, minor medium gravel, moist, slight product odor.
6		5.5-6.0	7		
7		6.0-6.5	8		
8					
9			GT 4-2		Light gray-green, plastic clay, moist, slight product odor.
10		10.0-10.5	4		
11		10.5-11.0	6		
12		11.0-11.5	9		
13					▽ 8/4/86
14			GT 4-3		Dark gray, fine sandy clay, saturated, slight product odor.
15		15.0-15.5	1		
16		15.5-16.0	2		
17		16.0-16.5			
18					
19					
20					

NOTE: Samples collected for geologic description and laboratory analyses.

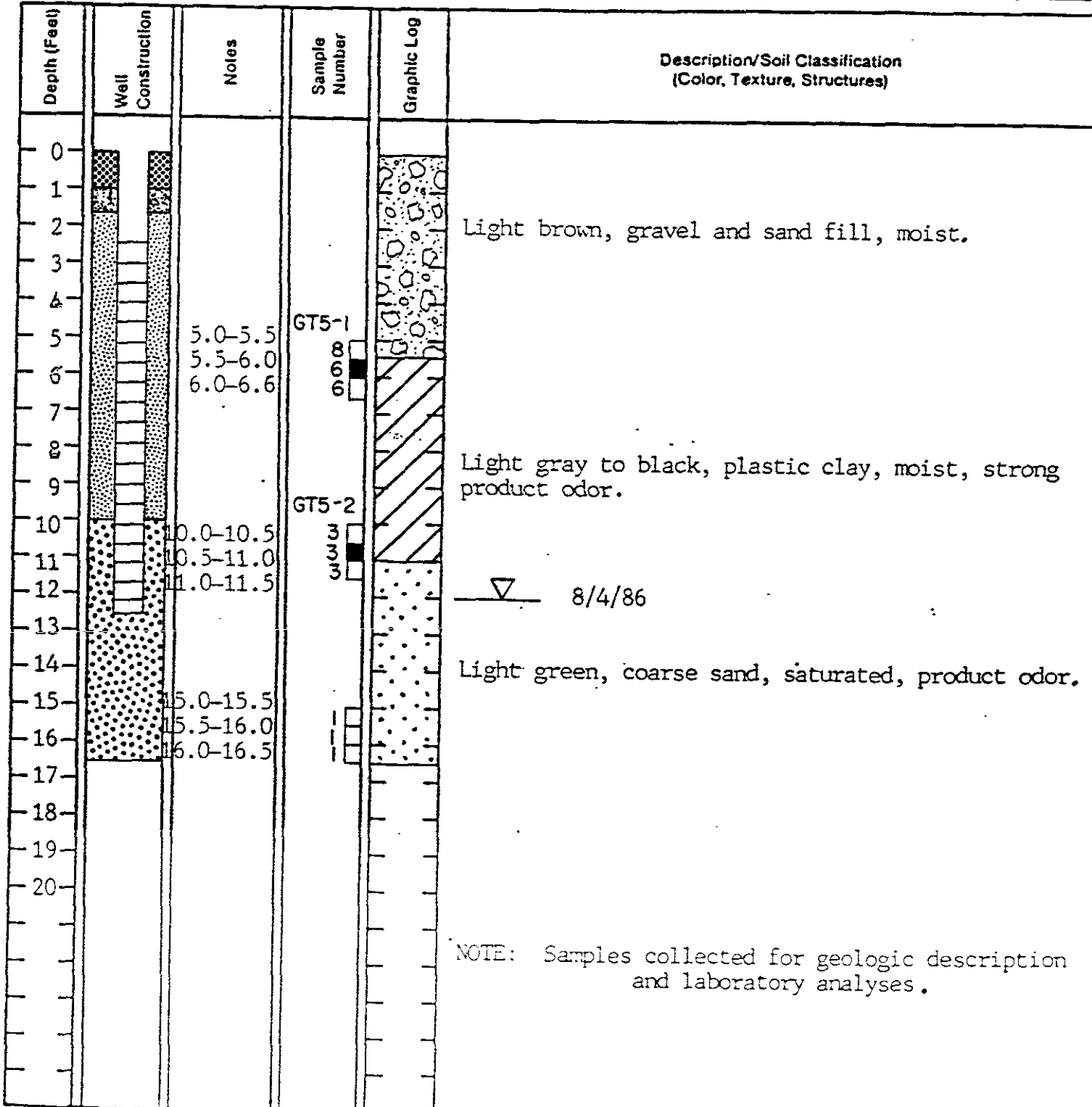


Project Blumver/PIE Emerville Owner PIE Nationwide
 Location Emerville Project Number 20-8124
 Date Drilled 8/4/86 Total Depth of Hole 16.5 ft Diameter 8 in.
 Surface Elevation _____ Water Level, Initial _____ 24-hrs. _____
 Screen: Dia. 3 in. Length 10 ft. Slot Size 0.02 in.
 Casing: Dia. 3 in. Length 2.5 ft. Type PVC
 Drilling Company Kvilhaug Drilling Drilling Method h.s. Auger
 Driller Chris Log by Kent Parrish

Sketch Map

 *Well constructed 8/7/86

 Notes Natural gravel pac
 to 10 ft.



NOTE: Samples collected for geologic description and laboratory analyses.



GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

Drilling Log

Well Number GT- 6

Project Blymver/PIE Owner PIE Nationwide

Location Emeryville Project Number 20-8124

Date Drilled 8/4/86 Total Depth of Hole 16.5 ft Diameter 8 in.

Surface Elevation _____ Water Level, Initial _____ 24-hrs _____

Screen: Dia. 3 in. Length 10 ft. Slot Size 0.02 in.

Casing: Dia. 3 in. Length 2 ft. Type PVC

Drilling Company Kvilhaug Drill Drilling Method h.s. Auger

Driller Chris Log by Kent Parrish

Sketch Map

* Well constructed 8/7/86

Notes ** Natural gravel pack to 8 ft.

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0					
1					Light brown, gravel and sand fill, dry.
2					
3					
4					Black, coarse sand, minor fine gravel, product odor.
5		5.0-5.5	GT 6-1		
6		5.5-6.0	510		
7		6.0-6.5	7		Dark green, clayey, coarse sand, moist, product odor.
8					
9					
10		10.0-10.5	GT 6-2		Dark green, plastic clay, moist, slight product odor.
11		10.5-11.0	2		
12		11.0-11.5	3		
13					▽ 8/4/86
14					
15		15.0-15.5	GT 6-3		Dark blue-green, coarse sand, saturated, very slight product odor.
16		15.5-16.0	2		
17		16.0-16.5	4		
18					
19					
20					

NOTE: Samples collected for geologic descriptions and laboratory analyses.



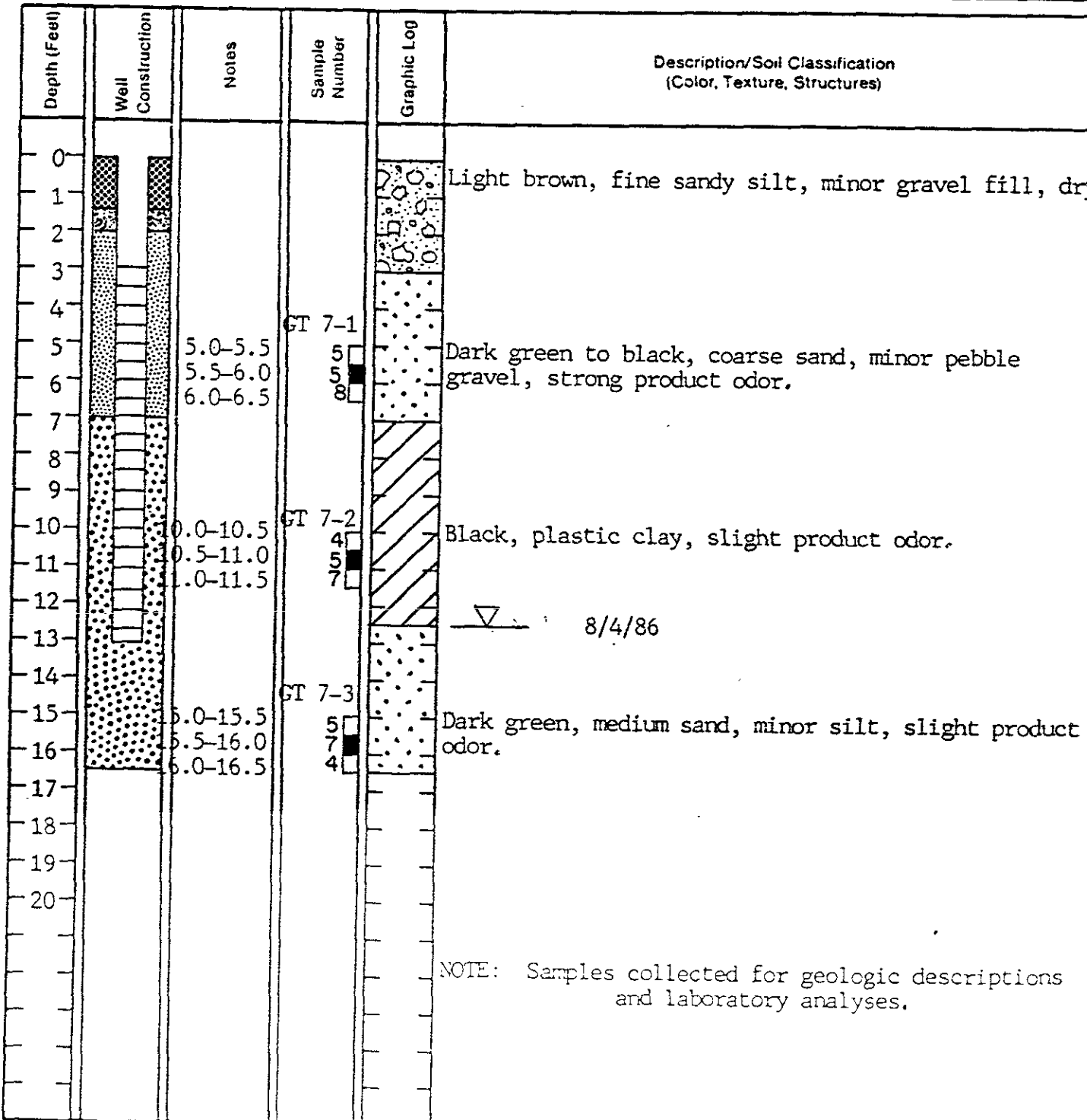
GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

Drilling L

Well Number GT-7
 Project Blymver/PIE Owner PIE Nationwide
 Location Emeryville Project Number 20-3124
 Date Drilled 8/4/86 Total Depth of Hole 16.5 ft Diameter 8 in.
 Surface Elevation _____ Water Level, Initial _____ 24-hrs. _____
 Screen: Dia. 4 in. Length 10 ft. Slot Size 0.02 in.
 Casing: Dia. 4 in. Length 3 ft. Type PVC
 Drilling Company Kvilhaug Drill Drilling Method h.s. Auger
 Driller Chris Log by Kent Parrish

Sketch Map
 * Well constructed 8/7/86
 Notes ** Natural gravel pack to 7 ft.





GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

Drilling Log

Project: Blumver/PIE Well Number GT-8
 Location: Emerville Owner: PIE Nationwide
 Date Drilled: 8/4/86 Project Number: 20-8124
 Total Depth of Hole: 10 ft. Diameter: 8 in.
 Surface Elevation: _____ Water Level, Initial: _____ 24-hrs. _____
 Screen: Dia. 4 in. Length: 5 ft. Slot Size: 0.02 in.
 Casing: Dia. 4 in. Length: 4 ft. Type: PVC
 Drilling Company: Kvilhaug Drill. Drilling Method: h.s. Auger
 Driller: Chris Log by: Kent Parrish

Sketch Map

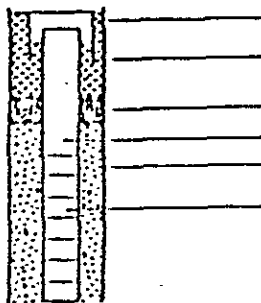
* Well constructed 8/7/86

Notes ** Natural gravel pack to 7 ft.

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0					
1					
2					Light brown gravel and coarse sand fill, moist.
3					
4					
5		5.0-5.5			
6		5.5-6.0	4-7-86		Black coarse sand, minor pebble gravel, strong product odor,
7		6.0-6.5			8/4/86
8		7.0-7.5			
9		7.5-8.0			
10		8.0-8.5	GT 8-1		Dark green, silty, coarse sand, saturated, slight product odor.
11					
12					
13					
14					
15					

NOTE: Samples collected for geologic descriptions and laboratory analyses.

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0		● PID 10	A 2 7 15		Brown, clayey sand, slightly moist, medium dense, slight product odor. Note: No product odor at 3.5 feet Change in moisture content to moist. 7-12-86 (1430).
2					
4					
6					



Street Box
Cement Grout Seal
Bentonite Seal
Well Casing
Sand/Gravel Pack
Well Screen

● PID
10
A 2
7
15

Vapor Photo Ionizer Detector Reading in Parts Per Million (ppm) From Soil Samples.
Sample Identification

2
7
15

Blow Counts to Drive Type U Sampler Using a 14016 Hammer Falling 30 Inches. Counts Are For Each Six Inch Increment the Sampler is Driven.



Interval Sampled



Sample Increment Retained For Laboratory Analyses.



Soil Classification Graphic/Symbol (See Unified Soil Classification System).

▼ 7-12-86
(1430)

Depth to Water, Date, Time



Interval Through Which Product Odor Detected By Field Inspection.

KEY TO BORING LOG



GROUNDWATER
TECHNOLOGY

MAJOR DIVISIONS		SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 1/2 of soil > no. 200 sieve size)	<u>GRAVELS</u> (More than 1/2 of coarse fraction > no. 4 sieve size)	GW	Well graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	<u>SANDS</u> (More than 1/2 of coarse fraction < no. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE GRAINED SOILS (More than 1/2 of soil < no. 200 sieve size)	<u>SILTS & CLAYS</u> <u>LL < 50</u>	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
	<u>SILTS & CLAYS</u> <u>LL > 50</u>	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty silts, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils	

CLASSIFICATION CHART
(Unified Soil Classification System)

CLASSIFICATION	RANGE OF GRAIN SIZES	
	U.S. Standard Sieve Size	Grain Size In Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL coarse fine	3" to No. 4	76.2 to 4.76
	3" to 1/2"	76.2 to 19.1
	1/2" to No. 4	19.1 to 4.76
SAND coarse medium fine	No. 4 to No. 200	4.76 to 0.074
	No. 4 to No. 10	4.76 to 2.00
	No. 10 to No. 40	2.00 to 0.420
	No. 40 to No. 200	0.420 to 0.074
SILT & CLAY	Below No. 200	Below 0.074

GRAIN SIZE CHART

SANDS AND GRAVELS	BLOWS/FOOT [†]
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

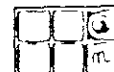
RELATIVE DENSITY

SILTS AND CLAYS	BLOWS/FOOT [†]
VERY SOFT	0 - 2
SOFT	2 - 4
MEDIUM STIFF	4 - 8
STIFF	8 - 16
VERY STIFF	16 - 32
HARD	OVER 32

CONSISTENCY

METHOD OF SOIL CLASSIFICATION

[†] NUMBER OF BLOWS OF 140 POUND HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT SPOON (ASTM D-1586)





Thermo Analytical Inc

RECEIVED
AUG 28 1986

TMA/ERG

1400 West 53rd Street

Suite 460

Emeryville, CA 94608-2946

(415) 652-2300

August 11, 1986

Groundwater Technology
4080 Pike Lane, Suite #D
Concord, CA 94520

Attention: Jan Jacobsen

Report #9067

P.O. #554

RE: Twelve (12) soil samples submitted on August 5, 1986 for rush diesel fuel analysis; also six (6) samples for rush waste oil analysis; two (2) soil samples for halocarbon analysis.

Procedure: The samples are analyzed for diesel fuel by following the method described in Attachment 2, Analytical Procedures for Fuel Leak Investigations. The samples are extracted with carbon disulfide and then injected into a gas chromatograph fitted with a flame ionization detector. Quantitation is performed, as total hydrocarbon response, against known concentrations of diesel fuel. The limit of detection for this method of analysis is 100 parts per million (mg/kg).

The samples are analyzed for waste oil by following a modified EPA Method 3510 extraction procedure. The samples are extracted three times with hexane. The solvent is removed from the combined extracts and carbon disulfide is added. The solution is injected into a gas chromatograph fitted with a flame ionization detector. Quantitation is performed, as total hydrocarbon response, against a solution made from a known concentration of light machine oil. The limit of detection for this method of analysis is ten parts per million (mg/kg).

The samples are analyzed for halocarbon compounds by following a modified EPA Method 601 procedure. The chlorinated compounds are analyzed with a Hall detector. Quantitation is performed against solutions made from known concentrations of halocarbon compounds. The limits of detection are higher than those specified in the EPA Methods, because of dilution.

The results of the hydrocarbon and halocarbon analyses, are shown in Tables I and II respectively.

Submitted by:

Robert B. Flay
Manager, Organics Department

RBF:sml

Table I

<u>ERG #</u>	<u>CLIENT ID</u>	<u>WASTE OIL</u>	<u>DIESEL FUEL</u>
9067-1	GT 1-1	11000*	--
9067-2	GT 1-2	2500	--
9067-3	GT 2-1	26	--
9067-4	GT 2-2	16000	--
9067-5	GT 2-3	30	--
9067-6	GT 3-1	930**	--
9067-7	GT 4-1	--	ND(100)
9067-8	GT 4-2	--	680
9067-9	GT 4-3	--	ND(100)
9067-10	GT 5-1	--	110
9067-11	GT 5-2	--	ND(100)
9067-12	GT 6-1	--	6800
9067-13	GT 6-2	--	ND(100)
9067-14	GT 6-3	--	ND(100)
9067-15	GT 7-1	--	110
9067-16	GT 7-2	--	1400
9067-17	GT 7-3	--	ND(100)
9067-18	GT 8-1	--	3800

*reinjected, 7900 ppm

**reinjected, 850 ppm

ND = None detected. The limits of detection are in ().

Concentration (ug/kg)

CLIENT: Groundwater Technology

	METHOD DETECT. LIMIT	GT 1-1	GT 6-1
Chloromethane	20	ND	ND
Bromomethane	20	ND	ND
Dichlorodifluoromethane	20	ND	ND
Vinyl Chloride	20	ND	ND
Chloroethane	20	ND	ND
Trichlorofluoromethane	NA	ND	ND
Dichloromethane	0.4	ND	ND
1,1-Dichloromethane	0.13	ND	ND
1,1-Dichloroethane	0.07	ND	ND
Trans 1,2-Dichloroethene	0.10	ND	ND
Chloroform	0.1	ND	ND
1,2-Dichloroethane	0.03	ND	ND
1,1,1-Trichloroethane	0.03	ND	ND
Carbon Tetrachloride	0.12	ND	ND
2-Chloroethyl vinyl ether	0.13	ND	ND
Bromodichloromethane	0.10	ND	ND
1,2-Dichloropropane	0.1	ND	ND
Trans 1,3-Dichloropropene	0.4	ND	ND
Trichloroethene	0.2	ND	ND
3 Compounds*	0.1	ND	ND
Bromoform	5.0	ND	ND
2 Compounds**	0.1	ND	ND
Chlorobenzene	0.25	ND	ND
1,3 Dichlorobenzene	2	ND	ND
1,2 Dichlorobenzene	2	ND	ND
1,4 Dichlorobenzene	2	ND	ND

*Co-Elute: CHBr₂Cl, 1,1,2TCA, CIS-1,3 DCPE

**Co-lute: PCE 1,1,2,2 Tetrachloroethane



ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2948

August 7, 1986
Sample Date: 8/4/86
Sample Received: 8/5/86
Report: 110157

RECEIVED
AUG 19 1986
Ans'd.....

Groundwater Technology
5047 Clayton Road
Concord, CA 94521

<u>Sample ID/ANlab #</u>	<u>TOTAL HYDROCARBONS, MG/L BASED ON DIESEL</u>
Well GT 4/110157-01	4
Well GT 3/110157-02	20
Well GT 2/110157-03	16
Well GT 1/110157-04	3200
Well GT 6/110157-05	< 1
Well GT 5/110157-06	< 1
Well GT 8/110157-07	600
Well GT 7/110157-08	13
Pit Samples Tr 3/110157-09	NA
Pit Samples Tr 1/110157-10	2000

NA = Not Analyzed

Data Certified By *Neil C. Candi*

Report Approved By *Roger Elliott*



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PURGABLE AROMATICS
EPA # 8020

CLIENT: Groundwater Technology REPORT #: 110157 PAGE 1

SAMPLE DESCRIPTION Well GT 4 ANLAB ID#: 110157-01 UNITS: ug/l

<u>COMPOUND</u>	<u>CONCENTRATION</u>
BENZENE	< 2
CHLOROBENZENE	NA
1,2 - DICHLOROBENZENE	NA
1,3 - DICHLOROBENZENE	NA
1,4 - DICHLOROBENZENE	NA
ETHYLBENZENE	NA
TOLUENE	7
XYLENES	< 2

OTHER COMPOUNDS DETECTED
OR REQUESTED

CONCENTRATION

N/A = NOT ANALYZED

N/D = NONE DETECTED AS SPECIFIED IN THE EPA METHOD

DATA CERTIFIED INIT. W REPORT APPROVED INIT. MS

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PURGABLE AROMATICS
EPA # 8020

CLIENT: Groundwater Technology REPORT #: 110157 PAGE 2

SAMPLE DESCRIPTION Well GT 3 ANLAB ID#: 110157-02 UNITS: ug/l

<u>COMPOUND</u>	<u>CONCENTRATION</u>
BENZENE	870
CHLOROBENZENE	NA
1,2 - DICHLOROBENZENE	NA
1,3 - DICHLOROBENZENE	NA
1,4 - DICHLOROBENZENE	NA
ETHYLBENZENE	NA
TOLUENE	4.3
XYLENES	34

OTHER COMPOUNDS DETECTED
OR REQUESTED

CONCENTRATION

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N/D = NONE DETECTED AS SPECIFIED IN THE EPA METHOD

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PURGABLE AROMATICS
EPA # 8020

CLIENT: Groundwater Technology REPORT #: 110157 PAGE 2

SAMPLE DESCRIPTION Well GT 2 ANLAB ID#: 110157-03 UNITS: ug/l

<u>COMPOUND</u>	<u>CONCENTRATION</u>
BENZENE	260
CHLOROGENZENE	NA
1,2 - DICHLOROGENZENE	NA
1,3 - DICHLOROGENZENE	NA
1,4 - DICHLOROGENZENE	NA
ETHYLBENZENE	NA
TOLUENE	< 2
XYLENES	8

OTHER COMPOUNDS DETECTED
OR REQUESTED CONCENTRATION

N/A = NOT ANALYZED
N/D = NONE DETECTED AS SPECIFIED IN THE EPA METHOD

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PURGABLE AROMATICS
EPA # 8020

CLIENT: Groundwater Technology REPORT #: 110157 PAGE 4

SAMPLE DESCRIPTION Well GT 1 ANLAB ID#: 110157-04 UNITS: ug/l

<u>COMPOUND</u>	<u>CONCENTRATION</u>
BENZENE	2500
CHLOROBENZENE	NA
1,2 - DICHLOROBENZENE	NA
1,3 - DICHLOROBENZENE	NA
1,4 - DICHLOROBENZENE	NA
ETHYLBENZENE	NA
TOLUENE	44
XYLENES	490

OTHER COMPOUNDS DETECTED
OR REQUESTED _____

CONCENTRATION

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REPORT APPROVED INIT. [Signature]



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PURGABLE AROMATICS
EPA # 8020

CLIENT: Groundwater Technology REPORT #: 110157 PAGE 5

SAMPLE DESCRIPTION Well GT 6 ANLAB ID#: 110157-05 UNITS: ug/l

<u>COMPOUND</u>	<u>CONCENTRATION</u>
BENZENE	< 2
CHLOROBENZENE	NA
1,2 - DICHLOROBENZENE	NA
1,3 - DICHLOROBENZENE	NA
1,4 - DICHLOROBENZENE	NA
ETHYLBENZENE	NA
TOLUENE	< 2
XYLENES	5

OTHER COMPOUNDS DETECTED
OR REQUESTED

CONCENTRATION

N/A = NOT ANALYZED

N/D = NONE DETECTED AS SPECIFIED IN THE EPA METHOD

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PURGABLE AROMATICS
EPA # 8020

CLIENT: Groundwater Technology REPORT #: 110157 PAGE 6

SAMPLE DESCRIPTION Well GT 5 ANLAB ID#: 110157-06 UNITS: ug/l

<u>COMPOUND</u>	<u>CONCENTRATION</u>
BENZENE	42
CHLORO BENZENE	NA
1,2 - DICHLORO BENZENE	NA
1,3 - DICHLORO BENZENE	NA
1,4 - DICHLORO BENZENE	NA
ETHYL BENZENE	NA
TOLUENE	< 2
XYLENES	< 2

OTHER COMPOUNDS DETECTED
OR REQUESTED CONCENTRATION

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N/D = NONE DETECTED AS SPECIFIED IN THE EPA METHOD

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PURGABLE AROMATICS
EPA # 8020

CLIENT: Groundwater Technology REPORT #: 110157 PAGE 7

SAMPLE DESCRIPTION Well GT 8 ANLAB ID#: 110157-07 UNITS: ug/l

<u>COMPOUND</u>	<u>CONCENTRATION</u>
BENZENE	77,000
CHLOROBENZENE	NA
1,2 - DICHLOROBENZENE	NA
1,3 - DICHLOROBENZENE	NA
1,4 - DICHLOROBENZENE	NA
ETHYLBENZENE	NA
TOLUENE	56
XYLENES	400

OTHER COMPOUNDS DETECTED
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PURGABLE AROMATICS
EPA # 8020

CLIENT: Groundwater Technology REPORT #: 110157 PAGE 8

SAMPLE DESCRIPTION Well GT 7 ANLAB ID#: 110157-08 UNITS: ug/l

<u>COMPOUND</u>	<u>CONCENTRATION</u>
BENZENE	480
CHLOROBENZENE	NA
1,2 - DICHLOROBENZENE	NA
1,3 - DICHLOROBENZENE	NA
1,4 - DICHLOROBENZENE	NA
ETHYLBENZENE	NA
TOLUENE	40
XYLENES	330

OTHER COMPOUNDS DETECTED
OR REQUESTED

CONCENTRATION

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PURGABLE AROMATICS
EPA # 8020

CLIENT: Groundwater Technology REPORT #: 110157 PAGE 9
SAMPLE DESCRIPTION Pit Samples ANLAB ID#: 110157-09 UNITS: ug/l
Pit TR 3

<u>COMPOUND</u>	<u>CONCENTRATION</u>
BENZENE	33
CHLORO BENZENE	NA
1,2 - DICHLORO BENZENE	NA
1,3 - DICHLORO BENZENE	NA
1,4 - DICHLORO BENZENE	NA
ETHYLBENZENE	NA
TOLUENE	< 2
XYLENES	200

OTHER COMPOUNDS DETECTED
OR REQUESTED CONCENTRATION

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N/D = NONE DETECTED AS SPECIFIED IN THE EPA METHOD

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PURGABLE AROMATICS
EPA # 8020

CLIENT: Groundwater Technology REPORT #: 110157 PAGE 10

SAMPLE DESCRIPTION Pit Samples ANLAB ID#: 110157-10 UNITS: ug/l

Pit Tr 1

<u>COMPOUND</u>	<u>CONCENTRATION</u>
BENZENE	320
CHLOROBENZENE	NA
1,2 - DICHLOROBENZENE	NA
1,3 - DICHLOROBENZENE	NA
1,4 - DICHLOROBENZENE	NA
ETHYLBENZENE	NA
TOLUENE	< 2
XYLENES	20

OTHER COMPOUNDS DETECTED
OR REQUESTED

CONCENTRATION

N/A = NOT ANALYZED

N/D = NONE DETECTED AS SPECIFIED IN THE EPA METHOD

DATA CERTIFIED INIT. *lu*

REPORT APPROVED INIT. *Mac*



LOG NO: E86-12-383

Received: 18 DEC 86

Reported: 29 DEC 86

Mr. Carl Basore
 Geomatrix Consultants
 1 Market Plaza, Spear Tower, Ste.717
 San Francisco, California 94105

Project: 1175A

REPORT OF ANALYTICAL RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED	
12-383-1	8-2-3	10 DEC 86	
12-383-2	8-1-2	10 DEC 86	
PARAMETER		12-383-1	12-383-2
Lead, mg/kg		27	11,000
Nitric Acid Digestion, Date		12.18.86	12.18.86

D. A. McLean, Laboratory Director

SOIL QUALITY ASSESSMENT
PIE FREIGHT TERMINAL SITE
Emeryville, California

INTRODUCTION

This report presents the results of our preliminary assessment of soil quality at the Pacific Intermountain Express (PIE) Freight Terminal site in Emeryville, California. The site encompasses approximately 14 acres and is bounded on the west by the Eastshore Freeway (I-80), on the north by the Day Inns development and on the east by Shellmound Street. The site location is shown in Figure 1.

The purpose of the study is to make a general assessment of shallow soil quality at the site. The assessment consisted of reviewing the historical development of the site, drilling ~~12~~ exploratory borings at the property and testing selected soil samples for anticipated soil contaminants. The study is limited to a general assessment of the presence of certain constituents in the fill that overlies the site. An assessment of soil quality adjacent to underground fuel tanks and of groundwater quality is being undertaken by others and are not included in the scope of this study. Accordingly, the depth of drilling and sampling was generally kept above groundwater level.

SITE DEVELOPMENT

~~The PIE site has been reclaimed from the bay by placing fill along the shoreline.~~ The actual date of fill placement is not known, but is estimated to have occurred about 50 years ago. An old street map printed between 1928 and 1932 shows the bay shoreline at about the present location of Shellmound Street. An aerial photograph of the site taken in 1949 shows the site completely filled-in and the main freight terminal building in operation. In addition, the existing two-story concrete building at the intersection of Powell Street and the Eastshore Freeway is in use and a truck terminal occupies the present Days Inn site.

In 1953, the northern half of the site was still vacant and an additional paved area had been constructed at the southern end of the site. However, by 1957, the entire site had been paved, a shop building constructed at the south end of the property and the main terminal building expanded toward the north. ~~Site development remained essentially unchanged until sometime between June 1983 and May 1985, when the northern leg of the main truck terminal was removed and construction of the Days Inn high rise building commenced.~~

The results of borings drilled for this study and for a separate geotechnical study indicate that the site is overlain with 8 to 18 feet of mixed clayey and sandy fill containing some construction debris. The average thickness of fill was generally found to be 10 to 11 feet. Over most of the site, the fill is underlain by soft bay sediments that increase in thickness toward the west and southwest across the site.

In addition to reviewing old maps and aerial photographs, several agencies were contacted to obtain additional information about the site. Specifically, the following information was obtained from these contacts:

Emeryville Department of Public Works (Wally Kolb, August 21, 1986)

The area was probably filled-in during the 1930's. The PIE terminal has been there "for years". This area is not part of the old dump.

California Department of Health Services (Howard Hatayama, August 29, 1986)

No reports regarding hazardous materials or studies in the vicinity of the PIE site are on file with the State.

Alameda County Public Works Department (Water Resources, August 22, 1986)

A review of the county files indicated that there is only one water well located within one-half mile of the site. The well is located south of the PIE site on the Judson Steel Corp. property and is 487 feet deep. However, several shallow groundwater monitoring wells have been installed on-site to collect samples for water quality testing and evaluation.

In summary, the site was reclaimed from the bay by placing 10 to 12 feet of fill over soft bay sediments about 50 years ago. The fill is primarily soil but contains some construction debris. The PIE Freight Terminal appears to have been the first development on the property. Reportedly, there are no water supply wells on the property and there are no records of previous problems associated with hazardous materials at the site. Studies of soil and groundwater quality adjacent to underground fuel tanks at the site are in progress and results of these studies will be presented in a separate report by others.

FIELD EXPLORATION AND LABORATORY TESTS

A total of 12 borings was drilled to depths of 6 to 8 feet at the approximate locations shown in Figure 1. Borings EB1 through EB7 were drilled on ~~September 16, 1986~~ and Borings EB8 through EB12 were completed on December 10, 1986. The drilling and sampling were performed by Bay Area Exploration, Inc. of Suisun, California under the direction of Geomatrix Consultants. Before drilling and sampling started at each borehole, all downhole equipment (augers, sampler and sampler liners) was steam-cleaned to minimize the possibility of cross-contamination, either from hole to hole or vertically within each hole.

~~The borings were advanced to depths of six to eight feet using 8-inch hollow-stem augers.~~ The borings were kept shallow in an effort to stay above the current groundwater level at the site. Samples were obtained using a modified California drive sampler having an inside diameter of 2 inches and an outside diameter of 2-1/2 inches. The sampler contained thin-walled, segmented brass tubes and was driven into the soil at each sampling depth prior to advancing the borehole with the drill bit. After the sampler was driven, it was withdrawn from the borehole and the brass tubes removed. The samples were then examined in the field to identify soil type and the presence of odors. An apparent petroleum odor was detected in Borings EB5, EB9 and EB10, but no free petroleum was observed in any of the soil samples. As shown in the boring logs (Figures 2 through 13), soils encountered between the surface pavement and the groundwater

interface (at depths of approximately 6-1/2 to at least 8 feet) are primarily silty clay and silty sand fill materials with some construction debris.

Selected soil samples from each borehole were retained for chemical analysis. The sample tubes were sealed in aluminum foil, plastic end caps, and polyvinyl tape. The tubes were then labelled and stored in an ice-cooled chest for delivery to the analytical laboratory. A chain-of-custody record (Appendix A) was completed for the sample shipment and accompanied the shipment until the samples were received by the laboratory.

The soil samples were analyzed by Brown and Caldwell Analytical Laboratories in Emeryville, California for concentrations of PCBs, total lead, and/or total petroleum hydrocarbons as diesel. Specifically, a total of 51 ~~laboratory chemical tests were performed on 36 soil samples obtained from the 12 exploratory borings. The testing program consisted of 21 tests for total petroleum hydrocarbons as diesel, 20 tests for lead (including one retest) and 10 tests for polychlorinated biphenyls (PCB).~~ The test results are presented at the corresponding sample location on the logs of borings, Figures 2 through 13, and in Appendix B.

FINDINGS AND CONCLUSIONS

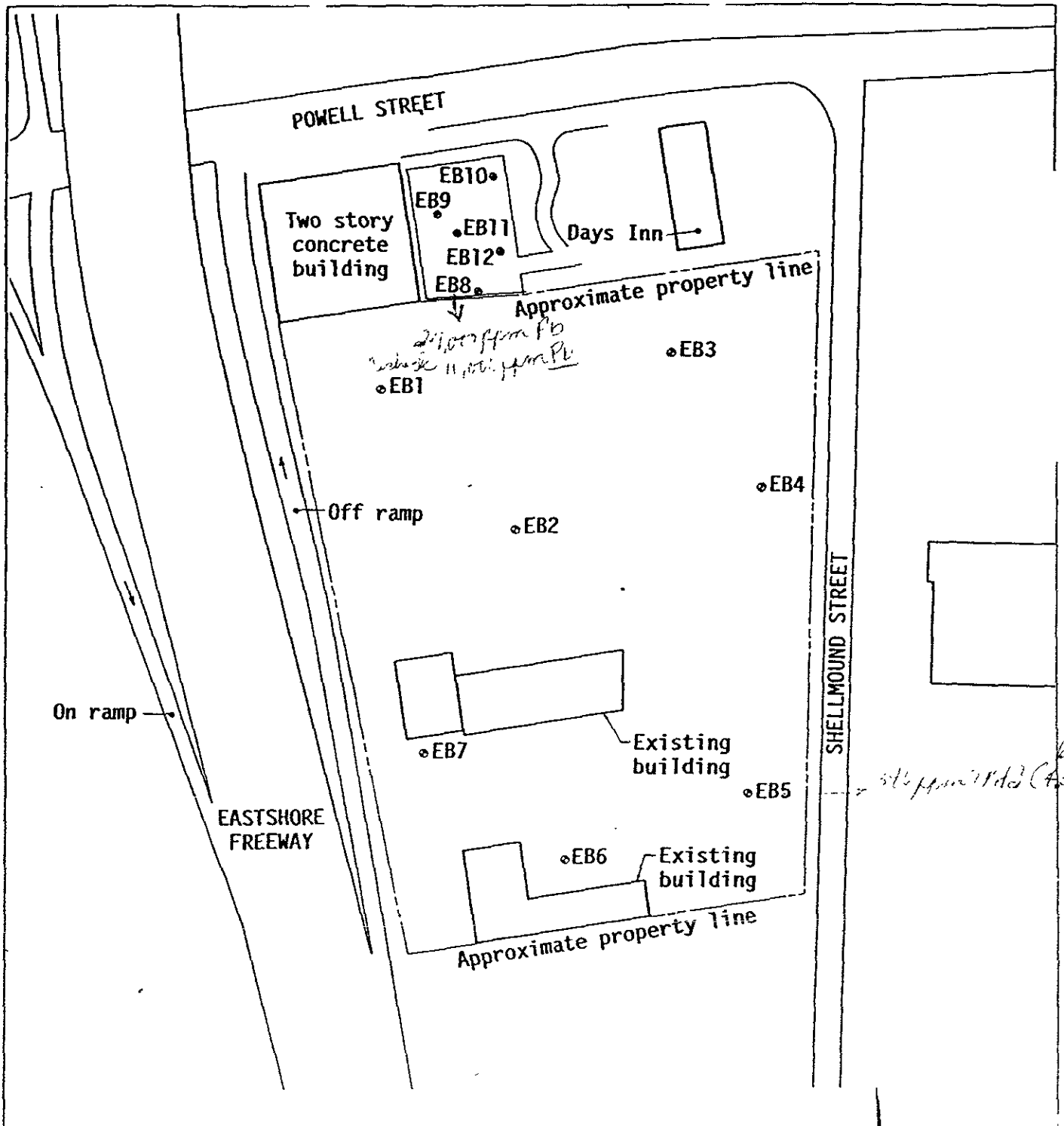
Laboratory analysis indicated concentrations of total petroleum hydrocarbons as diesel of ~~less than 10 mg/kg (detection limit) in 20 of the 21~~ samples tested for hydrocarbons. One sample obtained from Boring EB5 at a depth of approximately 4-1/2 feet contained petroleum hydrocarbons at a concentration of ~~390 mg/kg.~~ Based on currently available information, it is not known whether the hydrocarbons detected in Boring EB5 are associated with a localized leak or with the fuel tanks recently removed from the southern portion of the site.

All samples tested for PCBs were below the total threshold limit concentration of 50 mg/kg. Detectable levels of total PCB were found only

in boring EB5 and EB7 at depths of approximately 4-1/2 feet (3 mg/kg) and 2 feet (1 mg/kg), respectively.

Total lead was detected in all samples at concentrations generally ranging from 10 mg/kg to 380 mg/kg. The one sample containing lead at a concentration greater than the total threshold limit concentration of 1000 mg/kg, was obtained at a depth of approximately two feet in Boring EB8. The original test results for this sample and the results from retesting the sample are 24,000 mg/kg and 11,000 mg/kg, respectively.

The soil quality assessment program described herein is preliminary in nature and was intended to assess the possibility of shallow soil contamination at the site. Based on the results of this phase of work, extensive, area-wide soil contamination relating to petroleum hydrocarbons, lead, and PCB does not appear to exist in the on-site fill above the groundwater level. There is evidence that at least localized contamination of petroleum hydrocarbons and lead does exist and that these results should be discussed with appropriate regulatory agencies before construction activities commence at the site. In addition, site grading work should be observed for evidence of poor soil quality or obvious subsurface contamination. If encountered, appropriate mitigation measures should then be taken.



EB8
21,000 sq ft
11,000 sq ft


Project No 1175A	P.I.E. Site Emeryville, California	SITE AND BORING LOCATION MAP	Figure 1
Geomatrix Consultants			

Project: P.I.E. SITE
EMERYVILLE, CALIFORNIA

Log of Boring EB-1

Type of Boring: 8 " H.S. AUGER
Hammer Weight: 140 lb.

Date Drilled: September 16, 1986
Water Depth: 7.5 ft.

MATERIAL DESCRIPTION	DEPTH feet	Sample No.	ft. below Foot	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE	0 - 1					
SILTY CLAY FILL dark gray, stiff, mixed with organics and some construction debris (brick, rock, etc.)	1 - 2	1	22	<10	<0.5	48
	2 - 4	2	17	<10	<0.5	22
increasing gravel content	4 - 6					
	6 - 8	3	4			
BOTTOM OF BORING AT 8 FEET						
LEGEND PHC = Petroleum Hydrocarbons PCB = Polychlorinated Biphenyls Lead = Inorganic Lead  = Sample interval	8 - 10					
	10 - 12					
	12 - 14					
	14 - 16					
	16 - 18					
	18 - 20					
	20 - 22					
	22 - 24					
	24 - 26					
	26 - 28					

Project: P.I.E. SITE
EMERYVILLE, CALIFORNIA

Log of Boring EB-2

Type of Boring: 8 " H.S. AUGER
Hammer Weight: 140 lb.

Date Drilled: September 16, 1986
Water Depth:

MATERIAL DESCRIPTION	DEPTH feet	Sample No.	Blows/ feet	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE	0 - 1					
SILTY CLAY FILL dark gray, medium stiff, mixed with some construction debris, (brick, rock, etc.)	1 - 2	1	12	<10	---	91
minor decrease in stiffness	2 - 4	2	9	<10	---	10
	4 - 6	3	9			
BOTTOM OF BORING AT 7.5 FEET NO FREE WATER OBSERVED	7.5					
	8					
	10					
	12					
	14					
	16					
	18					
	20					
	22					

Project: P.I.E. SITE EMERYVILLE, CALIFORNIA		Log of Boring EB-3				
Type of Boring: 8 " H.S. AUGER		Date Drilled: September 16, 1986				
Hammer Weight: 140 lb.		Water Depth: 7 ft.				
MATERIAL DESCRIPTION	DEPTH feet	Sample No.	Blows/ foot	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE	0					
SILTY CLAY FILL dark gray, medium stiff to stiff, mixed with some construction debris and occasional silty sand lenses.	2	1	17	---	<0.5	12
	4	2	23	---	<0.5	60
	6	3	6			
SILTY SAND FILL Blue-grey, loose.	7					
BOTTOM OF BORING AT 7 FEET	8					
	10					
	12					
	14					
	16					
	18					
	20					
	22					

Project: P.I.E. SITE
EMERYVILLE, CALIFORNIA

Log of Boring EB-4

Type of Boring: 8 " H.S. AUGER
Hammer Weight : 140 lb.

Date Drilled: September 16, 1986
Water Depth: 6.5 ft.

MATERIAL DESCRIPTION	DEPTH feet	Sample No.	Blows/ Feet	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE	0 - 1					
SILTY CLAY FILL dark gray, medium stiff to stiff, mixed with some construction debris decrease in stiffness to soft and increasing sand content	1 - 2	1	13	<10	---	14
	2 - 4	2	9	<10	---	37
	4 - 6	3	3			
BOTTOM OF BORING AT 7 FEET	6 - 7					
	7 - 8					
	8 - 9					
	9 - 10					
	10 - 11					
	11 - 12					
	12 - 13					
	13 - 14					
	14 - 15					
	15 - 16					
	16 - 17					
	17 - 18					
	18 - 19					
	19 - 20					
	20 - 21					
	21 - 22					

Project: P.I.E. SITE EMERYVILLE, CALIFORNIA	<h1 style="margin: 0;">Log of Boring EB-5</h1>
--	--

Type of Boring: 8 " H.S. AUGER	Date Drilled: September 16, 1986
Hammer Weight : 140 lb.	Water Depth: 7 ft.

MATERIAL DESCRIPTION	DEPTH feet	Sample No.	Blows/ Foot	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE	1					
SILTY CLAY FILL dark gray, medium stiff to stiff, mixed with some construction debris some silty sand encountered between 2 and 4.5 feet	2	1	15	<10	<0.5	42
	4	2	13			
	6	3	10	390	3	22
BOTTOM OF BORING AT 7 FEET	8					
	10					
	12					
	14					
	16					
	18					
	20					
	22					

Project: P.I.E. SITE
EMERYVILLE, CALIFORNIA

Log of Boring EB-6

Type of Boring: 8 " H.S. AUGER
Hammer Weight: 140 lb.

Date Drilled: September 16, 1986
Water Depth:

MATERIAL DESCRIPTION	DEPTH feet	Sample No.	Blows/ Foot	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE	0 - 1					
SILTY SAND FILL medium gray, mixed with small construction debris	1 - 2	1	36	<10	---	210
	2 - 4	2	27	<10	---	12
SILTY CLAY FILL dark gray, soft to medium stiff, very moist	4 - 7.5	3	7			
BOTTOM OF BORING AT 7.5 FEET NO FREE WATER OBSERVED	7.5					
	8					
	10					
	12					
	14					
	16					
	18					
	20					
	22					

Project: P.I.E. SITE
EMERYVILLE, CALIFORNIA

Log of Boring EB-7

Type of Boring: 8 " H.S. AUGER
Hammer Weight : 140 lb.

Date Drilled: September 16, 1986
Water Depth:

MATERIAL DESCRIPTION	DEPTH feet	Sample No.	Blows/ Foot	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE						
SANDY CLAY FILL dark gray, stiff, mixed with some construction debris (brick, rock, etc.)	2	1	24	<10	1	16
SILTY SAND FILL dark grey, loose, moist, with some construction debris and lenses of silty clay	4	2	7	<10	<0.5	380
BOTTOM OF BORING AT 8 FEET NO FREE WATER OBSERVED	8	3	10			
	10					
	12					
	14					
	16					
	18					
	20					
	22					

Project: P.I.E. SITE
EMERYVILLE, CALIFORNIA

Log of Boring EB-8

Type of Boring: 8 " H.S. AUGER
Hammer Weight: 140 lb.

Date Drilled: December 10, 1986
Water Depth: 7 ft.

MATERIAL DESCRIPTION	DEPTH feet	Sample No.	Blows/ Foot	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE	0 - 1					
SILTY SAND FILL dark gray, medium dense, damp, with some sand and rock fragments	1 - 2	1	23	<10	-----	24000 (11000)*
SILTY CLAY FILL yellow-brown, stiff, dry to damp	2 - 4	2	10	<10	-----	27
SILTY SAND FILL yellow-brown, loose, moist	4 - 6	3				
BOTTOM OF BORING AT 7 FEET WATER OBSERVED AT BOTTOM OF SAMPLER	6 - 8					
*Results of retest	8 - 10					
	10 - 12					
	12 - 14					
	14 - 16					
	16 - 18					
	18 - 20					
	20 - 22					

Project: P.I.E. SITE
EMERYVILLE, CALIFORNIA

Log of Boring EB-9

Type of Boring: 8 " H.S. AUGER
Hammer Weight : 140 lb.

Date Drilled: December 10, 1986
Water Depth: ft.

MATERIAL DESCRIPTION	DEPTH feet	Sample No.	Blows/ Foot	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE	0 - 1					
SILTY SAND FILL gray-green, medium dense, damp, with some sand and rock fragments.	1 - 2	1	23	<10	<0.5	8
SILTY CLAY FILL black, stiff, damp	2 - 4	2	13	-----	-----	78
slight diesel odor encountered construction debris, becoming more moist	4 - 6	3	18	<10	-----	-----
BOTTOM OF BORING AT 6.5 FEET NO WATER OBSERVED	6.5					
	8					
	10					
	12					
	14					
	16					
	18					
	20					
	22					

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Figure 10

Project: P.I.E. SITE
EMERYVILLE, CALIFORNIA

Log of Boring EB-10

Type of Boring: 8 " H.S. AUGER
Hammer Weight : 140 lb.

Date Drilled: December 10, 1986
Water Depth: ft.

MATERIAL DESCRIPTION	DEPTH feet	Sample No.	Stone/ Feet	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE	0 - 1					
SILTY SAND FILL gray-green, medium dense, damp, with some rock fragments	1 - 2		14	<10	---	22
SANDY CLAY FILL black, stiff, damp, with fine sand and construction debris	2 - 4		17	<10	<0.5	---
SILTY SAND FILL black, loose, damp, very slight diesel odor	4 - 6		10	---	---	---
SANDY CLAY FILL black, medium stiff, damp, with fine sand	6 - 8					
BOTTOM OF BORING AT 6.5 FEET NO FREE WATER OBSERVED	8.5					
	10					
	12					
	14					
	16					
	18					
	20					
	22					

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1175A

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Figure 11

Project: P.I.E. SITE
EMERYVILLE, CALIFORNIA

Log of Boring EB-11

Type of Boring: 8 " H.S. AUGER
Hammer Weight : 140 lb.

Date Drilled: December 10, 1986
Water Depth: ft.

MATERIAL DESCRIPTION	DEPTH feet	Sample No.	Blows/ Foot	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE	0 - 2					
SILTY CLAY FILL yellow-brown, stiff, dry to damp becoming green, with sand and gravel	2 - 6		23 11 3	----- ----- <10	----- ----- -----	----- ----- -----
SILTY SAND FILL dark gray, loose, moist	6 - 6.5					
BOTTOM OF BORING AT 6.5 FEET NO FREE WATER OBSERVED	6.5 - 22					

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Figure 12

Project: P.I.E. SITE
EMERYVILLE, CALIFORNIA

Log of Boring EB-12

Type of Boring: 8 " H.S. AUGER
Hammer Weight : 140 lb.

Date Drilled: December 10, 1986
Water Depth: ft.

MATERIAL DESCRIPTION	DEPTH feet	Sample No.	Blow/ Feet	chemical tests		
				TOTAL PHC SOIL mg/kg	TOTAL PCB SOIL mg/kg	TOTAL LEAD SOIL mg/kg
ASPHALTIC PAVEMENT and AGGREGATE BASE	0					
SILTY CLAY FILL gray-green, stiff, damp	2		23			
SILTY SAND FILL gray-green, medium dense, damp becoming dark gray	4		14	<10		
SILTY CLAY FILL black, medium stiff, damp	6		2	<10		
BOTTOM OF BORING AT 6.5 FEET NO FREE WATER OBSERVED	6.5					
	8					
	10					
	12					
	14					
	16					
	18					
	20					
	22					

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Figure 13



LOG NO: E86-09-299

Received: 16 SEP 86

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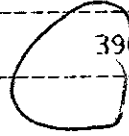
Mr. John Rosso
 Geomatrix Consultants
 1 Market Plaza, Spear Tower, Ste.717
 San Francisco, California 94105

Project: 1175A

REPORT OF ANALYTICAL RESULTS

Page 2

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES					DATE SAMPLED
09-299-6	4-2-3					16 SEP 86
09-299-7	5-1-4					16 SEP 86
09-299-8	5-2-3					16 SEP 86
09-299-9	6-1-3					16 SEP 86
09-299-10	6-2-3					16 SEP 86
PARAMETER	09-299-6	09-299-7	09-299-8	09-299-9	09-299-10	
Diesel Fingerprint, mg/kg	<10	<10	390	<10	<10	





LOG NO: E86-09-299

Received: 16 SEP 86

Reported: 01 OCT 86

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES					DATE SAMPLED
09-299-11	7-1-3					16 SEP 86
09-299-12	7-2-4					16 SEP 86
09-299-13	1-1-4					16 SEP 86
09-299-14	1-2-2					16 SEP 86
09-299-15	3-1-3					16 SEP 86
PARAMETER	09-299-11	09-299-12	09-299-13	09-299-14	09-299-15	
Lead, mg/kg	---	---	48	22	12	
Nitric Acid Digestion, Date	---	---	09.25.86	09.25.86	09.25.86	
Polychlorinated Biphenyls						
Date Extracted	---	---	09.18.86	09.18.86	09.18.86	
Date Analyzed	---	---	09.29.86	09.29.86	09.29.86	
Aroclor 1016, mg/kg	---	---	<0.5	<0.5	<0.5	
Aroclor 1221, mg/kg	---	---	<0.5	<0.5	<0.5	
Aroclor 1232, mg/kg	---	---	<0.5	<0.5	<0.5	
Aroclor 1242, mg/kg	---	---	<0.5	<0.5	<0.5	
Aroclor 1248, mg/kg	---	---	<0.5	<0.5	<0.5	
Aroclor 1254, mg/kg	---	---	<0.5	<0.5	<0.5	
Aroclor 1260, mg/kg	---	---	<0.5	<0.5	<0.5	
Aroclor 1262, mg/kg	---	---	<0.5	<0.5	<0.5	
Total PCB's, mg/kg	---	---	<0.5	<0.5	<0.5	
Diesel Fingerprint, mg/kg	<10	<10	---	---	---	



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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED				
09-299-16	3-2-4	16 SEP 86				
09-299-17	5-1-3	16 SEP 86				
09-299-18	5-2-4	16 SEP 86				
09-299-19	7-1-4	16 SEP 86				
09-299-20	7-2-3	16 SEP 86				
PARAMETER	09-299-16	09-299-17	09-299-18	09-299-19	09-299-20	
Lead, mg/kg	60	42	22	16	380	
Nitric Acid Digestion, Date	09.25.86	09.25.86	09.25.86	09.26.86	09.26.86	
Polychlorinated Biphenyls						
Date Extracted	09.11.86	09.11.86	09.18.86	09.18.86	09.18.86	
Date Analyzed	09.29.86	09.29.86	09.27.86	09.29.86	09.27.86	
Aroclor 1016, mg/kg	<0.5	<0.5	<1	<1	<0.5	
Aroclor 1221, mg/kg	<0.5	<0.5	<1	<1	<0.5	
Aroclor 1232, mg/kg	<0.5	<0.5	3	1	<0.5	
Aroclor 1242, mg/kg	<0.5	<0.5	<1	<1	<0.5	
Aroclor 1248, mg/kg	<0.5	<0.5	<1	<1	<0.5	
Aroclor 1254, mg/kg	<0.5	<0.5	<1	<1	<0.5	
Aroclor 1260, mg/kg	<0.5	<0.5	<1	<1	<0.5	
Aroclor 1262, mg/kg	<0.5	<0.5	<1	<1	<0.5	
Total PCB's, mg/kg	<0.5	<0.5	3	1	<0.5	



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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED				
09-299-21	2-1-4	16 SEP 86				
09-299-22	2-2-2	16 SEP 86				
09-299-23	4-1-2	16 SEP 86				
09-299-24	4-2-4	16 SEP 86				
09-299-25	6-1-4	16 SEP 86				
PARAMETER	09-299-21	09-299-22	09-299-23	09-299-24	09-299-25	
Lead, mg/kg	91	10	14	37	210	
Nitric Acid Digestion, Date	09.26.86	09.26.86	09.26.86	09.26.86	09.26.86	



LOG NO: E86-09-299

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REPORT OF ANALYTICAL RESULTS

Page 6

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
09-299-26	6-2-4	16 SEP 86
PARAMETER	09-299-26	
Lead, mg/kg		12
Nitric Acid Digestion, Date		09.26.86

D. A. McLean, Laboratory Director



LOG NO: E86-12-216

Received: 10 DEC 86

Reported: 15 DEC 86

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REPORT OF ANALYTICAL RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
12-216-1	9-1-3	10 DEC 86
12-216-2	8-1-2	10 DEC 86
12-216-3	10-1-3	10 DEC 86
12-216-4	10-2-3	10 DEC 86
12-216-5	8-2-3	10 DEC 86

PARAMETER	12-216-1	12-216-2	12-216-3	12-216-4	12-216-5
Lead, mg/kg	7.6	24000	22	---	---
Nitric Acid Digestion, Date	12.10.86	12.10.86	12.10.86	---	---
Polychlorinated Biphenyls					
Date Extracted	12.10.86	---	---	12.10.86	---
Date Analyzed	12.11.86	---	---	12.11.86	---
Aroclor 1016, mg/kg	<0.5	---	---	<0.5	---
Aroclor 1221, mg/kg	<0.5	---	---	<0.5	---
Aroclor 1232, mg/kg	<0.5	---	---	<0.5	---
Aroclor 1242, mg/kg	<0.5	---	---	<0.5	---
Aroclor 1248, mg/kg	<0.5	---	---	<0.5	---
Aroclor 1254, mg/kg	<0.5	---	---	<0.5	---
Aroclor 1260, mg/kg	<0.5	---	---	<0.5	---
Aroclor 1262, mg/kg	<0.5	---	---	<0.5	---
Total PCB's, mg/kg	<0.5	---	---	<0.5	---
Diesel Fingerprint, mg/kg	<10	<10	<10	<10	<10



LOG NO: E86-12-216

Received: 10 DEC 86

Reported: 15 DEC 86

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REPORT OF ANALYTICAL RESULTS

Page 2

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED			
12-216-6	9-3-4	10 DEC 86			
2-216-7	9-2-3	10 DEC 86			
2-216-8	8-3-4	10 DEC 86			
12-216-9	10-3-2	10 DEC 86			
PARAMETER	12-216-6	12-216-7	12-216-8	12-216-9	
Sample Held, Not Analyzed	---	---	HELD	HELD	
Lead, mg/kg	---	78	---	---	
Nitric Acid Digestion, Date	---	12.10.86	---	---	
Diesel Fingerprint, mg/kg	<10	---	---	---	

D. A. McLean, Laboratory Director



LOG NO: E86-12-231

Received: 11 DEC 86

Reported: 17 DEC 86

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Project: 1175A

REPORT OF ANALYTICAL RESULTS

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES					DATE SAMPLED
2-231-1	11-2-3					10 DEC 86
2-231-2	12-2-3					10 DEC 86
2-231-3	12-3-3					10 DEC 86
2-231-4	12-1-2					10 DEC 86
2-231-5	11-1-2					10 DEC 86

PARAMETER	12-231-1	12-231-2	12-231-3	12-231-4	12-231-5
Sample Held, Not Analyzed	---	---	---	HELD	HELD
Diesel Fingerprint, mg/kg	<10	<10	<10	---	---


 Robert P. Young for
 R. A. McLean, Laboratory Director



LOG NO: E86-12-383

Received: 18 DEC 86

Reported: 29 DEC 86

Mr. Carl Basore
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1175A

REPORT OF ANALYTICAL RESULTS

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED	
12-383-1	8-2-3	10 DEC 86	
12-383-2	8-1-2	10 DEC 86	
PARAMETER		12-383-1	12-383-2
Lead, mg/kg		27	11,000
Nitric Acid Digestion, Date		12.18.86	12.18.86

D. A. McLean, Laboratory Director