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February 4, 1982

File: B-1163-1

Mr. Tom Pearson  
IT Enviroscience  
2450 Stanwell Drive, Suite 100  
Concord, California 94520

Subject: Groundwater Monitoring Well  
Installation Report  
Alameda Chevron Station  
Alameda, California

Dear Mr. Pearson:

The following letter report summarizes work performed by J. H. Kleinfelder & Associates at a Standard Oil service station in Alameda, California, on January 19, 1982. Our investigation was performed to enable IT Corporation to evaluate the limits of gasoline leakage from an underground gasoline storage tank.

Our work consisted of drilling 6 test borings, obtaining 4 soil samples, limited laboratory analysis, and completing the test borings as groundwater monitoring wells. The borings were drilled in the paved area on the perimeter of the service station property and adjacent to the underground storage tanks.

The borings were drilled with a CME-55 truck-mounted drill rig equipped with 6-inch diameter continuous flight hollow stem augers. All borings were made under the supervision of our field engineer who also logged and sampled the soils encountered in the borings. A description of the soils encountered in the borings is presented on the boring logs, Plates 2 through 7. A copy of the Unified Soil Classification System used to identify the site soils is presented on Plate 1.

Limited laboratory analysis was performed on selected samples to determine their moisture content and grain size distribution. The results of these tests are included on the boring logs and Plates 8 through 10. Permeability of the site soils was estimated using Hazen's correlation and the results of grain size distribution. The permeability of the site soils is approximately  $1.4 \times 10^{-2}$  cm/sec to  $2.6 \times 10^{-2}$  cm/sec.

Soils encountered in our borings were predominantly fine to medium grained sands with some traces of clay. These soils are aeolian in nature and generally loose to dense in consistency.



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Monitoring wells were installed in each of the borings after completion of the borings. The following table provides the total depth of each boring and the location of the perforated well screen section.

<u>Hole Number</u>	<u>Hole Depth (ft)</u>	<u>Well Screen Location (ft)</u>
1	20	3 - 18
2	20	3 - 18
3	20	3 - 18
4	20	3 - 18
5	20	3 - 18
6	20	3 - 18

All monitoring wells were constructed with 2-inch diameter PVC pipes with 0.010-inch slotted well screen sections. A typical monitoring well profile is presented on Plate 11 of this report.

We trust the information contained herein meets your needs at this time. If there are any questions regarding this report, please contact us.

Very truly yours,

J. H. KLEINFELDER & ASSOCIATES

*Christopher R. Nardi*

Christopher R. Nardi  
Staff Engineer

CRN:pjs

Attachments



DEPTH IN FEET

DEPTH IN FEET	DRY DENSITY lb/ft <sup>3</sup>	MOISTURE CONTENT % DRY WEIGHT	BLOW COUNT	SAMPLE	USCS	DESCRIPTION	WELL CONST.
0						Pavement section - 2"/6"	
					CH	Black silty clay, stiff, moist.	
3					SP	Dark gray brown sand, medium-grained, moist to very moist.  Easier drilling in saturated material	
6						▼ Very soft.	
9					SP	Slightly stiff. Blue to olive gray clayey fine-grained sand.	
12							
15					SP	Yellow brown clayey medium-grained sand, medium dense.	
18					SP	Grades to gray brown sand, loose to medium.	
21						Bottom of boring at 20 ft.	

Concrete, typ.  
Bentonite seal, typ.  
Well screen, typ.  
Sand backfill, typ.

**J.H. KLEINFELDER & ASSOCIATES**  
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PREPARED BY: FK      DATE: 1/28/82

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IT/ALAMEDA CHEVRON  
 ALAMEDA, CALIFORNIA



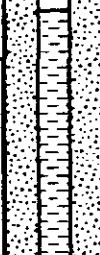
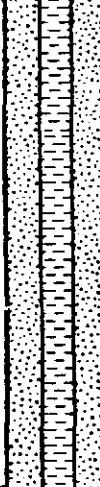
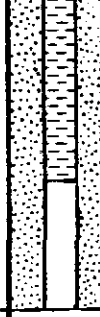


**LOG OF BORING NO. B-1**

PROJECT NO. B-1163-1

PLATE

2

DEPTH IN FEET

DEPTH IN FEET	DRY DENSITY lb/ft <sup>3</sup>	MOISTURE CONTENT & DRY WEIGHT	BLOW COUNT	SAMPLE	USCS	DESCRIPTION	WELL CONST.
0						Pavement section - 2"/6"	
3					SP	Dark gray brown, medium-grained sand, moist.	
6	18		Bag	2-4.5	SP	Grades to blue gray sand, trace clay, saturated material.	
9					SP	Stiffer, yellow brown clayey sand, medium dense.	
12						Color grades to light gray brown.	
15					SP	Reddish yellow clayey, sand, medium dense, saturated.	
18	12		Bag	2-18.5	SP		
21							

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IT/ALAMEDA CHEVRON  
 ALAMEDA, CALIFORNIA  
**LOG OF BORING NO. B-2**

PLATE

**3**

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DEPTH IN FEET

DEPTH IN FEET	DRY DENSITY lb/ft <sup>3</sup>	MOISTURE CONTENT % DRY WEIGHT	BLOW COUNT	SAMPLE	USCS	DESCRIPTION	WELL CONST.
0						Pavement section - 2"/6"	
						Reddish yellow subbase-fill.	
					SP	Dark brown fine-grained sand, moist, loose.	
3							
					SP	Blue gray medium-grained sand. loose.	
6			6	3-6 *		Saturated material. ▼	
						More dense. Olive gray sand, trace clay.	
9					SP		
12							
					SP	Dark yellow brown medium- grained clayey sand.	
15							
18							
21			35	3-21		Bottom of boring at 20 ft.	

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 ALAMEDA, CALIFORNIA  
 LOG OF BORING NO. B-3

PLATE

4

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DEPTH IN FEET

DEPTH IN FEET	DRY DENSITY lb/ft <sup>3</sup>	MOISTURE CONTENT & DRY WEIGHT	BLOW COUNT	SAMPLE	USCS	DESCRIPTION	WELL CONST.
0						Pavement section - 2"/6"	
						Reddish yellow subbase-fill.	
3					SP	Dark gray brown clayey, sand moist, medium.	
6						▼ Saturated, light color.	
9					SP	Dark blue gray sand, medium-grained, medium, trace clay. More dense.	
12			25	4-11 *		Yellow brown medium-grained, sand, some clay, medium. Lenses with light olive brown sand to bottom of boring	
15					SP		
18							
21						Bottom of boring at 20 ft.	

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 LOG OF BORING NO. B-4

PLATE

5

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PROJECT NO. B-1163-1

DEPTH IN FEET

DEPTH IN FEET	DRY DENSITY lb/ft <sup>3</sup>	MOISTURE CONTENT % DRY WEIGHT	BLOW COUNT	SAMPLE	USCS	DESCRIPTION	WELL CONST.
0						Pavement section - 2"/6"	
3					SP	Dark brown sand, moist, loose	
6					SP	▼ Yellow brown medium- grained sand, saturated, trace clay.	
9		19	Bag	5-8	SP	More dense, more clay.	
12					SP	Brown, clayey sand, medium.	
15					SP		
18						Caving sand.	
21						Bottom of boring at 20 ft.	

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 ALAMEDA, CALIFORNIA

LOG OF BORING NO. B-5

PLATE

6

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PROJECT NO. B-1163-1

DEPTH IN FEET

0	DRY DENSITY lb/ft <sup>3</sup>	MOISTURE CONTENT & DRY WEIGHT	BLOW COUNT	SAMPLE	USCS	DESCRIPTION	WELL CONST.
						Pavement section - 2"/6"	
		111	Bag	6-2	X SP	Dark brown fine-grained silty sand.	
3						Saturated material.	
6					▼	Grades to medium-grained yellow brown sand, trace clay.	
9						More dense, darker yellow brown, more clay.	
12					SP	Lenses of yellow and olive brown clayey medium-grained sand, medium dense.	
15							
18						As above.	
21						Bottom of boring at 20 ft.	

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IT/ALAMEDA CHEVRON  
 ALAMEDA, CALIFORNIA  
 LOG OF BORING NO. B-6

PLATE

7

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METAL WELL COVER

SCREW CAP



EXISTING PAVEMENT

1'-3'

BENTONITE

1'-2'

2" PVC CASING

10'-15'

FINE SAND

SCREEN SECTION

2'

BLANK SECTION

CAP

NOT TO SCALE

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PLATE

**TYPICAL WELL PROFILE**

11

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