Appendix D-1
Boring and Well Installation Logs

H2OGEOL
A GROUND WATER CONSULTANCY

BOREHOLE LITHOLOGIC LOG

BOREHOLE No. HEW6 Sheet 1 of 1

Project No.: Date: 01/18/02	Drilling Co. ASE Drilling Drill Model Iwan Auger
Client: Rhodia Inc., 100 Mococo Road, Martinez, CA	Drilling Method- Hand Operation Borehole Diameter 3.75-in
Location: east of Peyton Slough	Ground Surface Elevation Datum: ground surface
N 38° 1.780' W122° 6.569'	Borehole HEW6 was completed as monitoring well HEW6.
Logged by: GDL Driller: RCV/GDL	Sample and cuttings log. Well completed with casing 3.5 feet above ground.

Water Level				
Time				
Date				

Sampling Blowcounts: NOT APPLICABLE

RECOVERY feet

Depth feet: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27

Sample / Soil Sample Number / Graphic Soil Symbol / USCS Soil Symbol

Field Soil Description (all contacts uncertain within 0.1 feet).

- Greenish black 10Y 2.5/1 vegetative remains with clay. (First Encountered Water at 0.8 Feet.)
- Very dark brown 10YR 2/2 organic (30-40%) clay. (OH) (Neat Cement Grout)
- Black 2.5/N 30-40% organic clay with H2S odor.
- Black 2.5 N plastic clay/organic clay. H2S odor. (CH/OH)
- Dark greenish gray 10Y 3/1 plastic clay with up to 10% subrounded sandstone granules. (CH) (Bentonite Seal)
- Dark greenish gray 10Y 3/1 very clayey very fine to fine sand/ sandy clay. (LONESTAR No. 3 Sand)
- Monolayer of sandstone granules.
- Dark greenish gray 10Y 3/1 plastic clay. (CH)
- Decreasing clay increasing vegetative remains.
- Dark brown 7.5 YR 3/4 peat with 10% clay. (PT)

T.D. = 15.25 Ft.

Total Well Depth = 14.9 Feet bgs.
Total Well Depth = 18.45 Feet brm.
(brm = below reference mark.)
(bgs = below nominal ground surface.)

1-inch PVC casing and screen.
screen openings = 0.020 inch
CENTRALIZER

H2OGEOL
A GROUND WATER CONSULTANCY

BOREHOLE LITHOLOGIC LOG

BOREHOLE No. HEW2 Sheet 1 of 1

Project No.: Date: 01/30/02	Drilling Co. ASE Drilling Drill Model Iwan Auger
Client: Rhodia Inc., 100 Mococo Road, Martinez, CA	Drilling Method- Hand Operation Borehole Diameter 3.75-in
Location: east of Peyton Slough	Ground Surface Elevation Datum: ground surface
N 38º 1.984' W122º 6.649'	Borehole HEW2 was completed as monitoring well HEW2.
Logged by: GDL Driller: RCV/GDL	Sample and cuttings log. Well completed with casing 3.5 feet above ground.

Water Level				
Time				
Date				

Sampling Blowcounts	RECOVERY feet	Depth feet	Sample	Soil Sample Number	Graphic Soil Symbol	USCS Soil Symbol	Field Soil Description (all contacts uncertain within 0.1 feet).
N						PT/CH	Dark yellowish brown 10YR 4/6 root mat with clay.
O							First Encountered Water at 1.0 Feet. ▽
T		1					Gray N6/ plastic clay with abundant vegetative stem remains & roots.
		2					Neat Cement Grout
A							
P		3				CH	
P							
L		4					
I							
C		5					Diminishing vegetative remains with depth.
A							
B		6					Greenish gray 5GY 5/1 plastic clay with sparse vegetative remains.
L							
E		7				CH	
		8					
		9					
						CH	Dark greenish gray 10Y 3/1 plastic clay with vegetation fragments. Bentonite Seal
		10					
		11				CH/SC	Dark greenish gray 10Y 3/1 very clayey very fine to fine sand/ sandy clay.
		12					LONESTAR No. 3 Sand
		13					Dark greenish gray 10Y 3/1 plastic clay with <5% peatey masses.
		14				CH	
		15					Total Well Depth = 15.0 Feet bgs.
							Total Well Depth = 18.54 Feet brm.
		16				T.D. = 15.25 Ft.	(brm = below reference mark.)
							(bgs = below nominal ground surface.)
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					
		26					
		27					

1-inch PVC casing and screen.
screen openings = 0.020 inch
CENTRALIZER

H2OGEOL
A GROUND WATER CONSULTANCY

BOREHOLE LITHOLOGIC LOG

BOREHOLE No. HEW0 Sheet 1 of 1

Project No.: Date: 01/29/02	Drilling Co. ASE Drilling Drill Model Iwan Auger
Client: Rhodia Inc., 100 Mococo Road, Martinez, CA	Drilling Method- Hand Operation Borehole Diameter 3.75-in
Location: east of Peyton Slough	Ground Surface Elevation Datum: ground surface
N 38° 2.197' W122° 6.694'	Borehole HEW0 was completed as monitoring well HEW0.
Logged by: GDL Driller: RCV/GDL	Sample and cuttings log. Well completed with casing 3.5 feet above ground.

Water Level				
Time				
Date				

Sampling Blowcounts	RECOVERY feet	Depth test	Sample	Soil Sample Number	Graphic Soil Symbol	USCS Soil Symbol	Field Soil Description (all contacts uncertain within 0.1 feet).
N						PT/CH	Dark brown 7.5 YR 3/2 root mat with clay. First Encountered Water at 0.3 Feet.
O		1					
T						CH	Gray N6/ plastic clay with abundant vegetative stem remains & roots.
		2					
A							Neat Cement Grout
P		3					
P							Diminishing vegetative remains with depth.
L		4					
I							
C		5				CH	Gray N6/ plastic clay with sparse vegetative remains.
A							
B		6					
L							
E		7					Loss of vegetative remains.
		8					
		9				CH	Dark greenish gray 10Y 3/1 sensitive plastic clay.
		10					Bentonite Seal
		11				SC	Dark greenish gray 10Y 3/1 very clayey very fine to fine sand.
		12					LONESTAR No. 3 Sand
		13				CH	Dark greenish gray 10Y 3/1 plastic clay.
		14					
		15				CH/SC	Dark greenish gray 10Y 3/1 very fine to fine sandy clay/clayey sand. Total Well Depth = 14.9 Feet bgs. Total Well Depth = 18.40 Feet brm.
		16				T.D. = 15.25 Ft.	(brm = below reference mark.) (bgs = below nominal ground surface.)
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					
		26					
		27					

H2OGEOL

A GROUND WATER CONSULTANCY

BOREHOLE LITHOLOGIC LOG

BOREHOLE No. TI2 Sheet 1 of 1

Project No.: Date: 01/24/02

Client: Rhodia Inc., 100 Mococo Road, Martinez, CA

Location: east of Peyton Slough

N 38° 1.977' W122° 6.734'

Logged by: GDL Driller: RCV/GDL

Drilling Co. ASE Drilling Drill Model Iwan Auger

Drilling Method- Hand Operation Borehole Diameter 3.75-in

Ground Surface Elevation Datum: ground surface

Borehole TI2 was completed as monitoring well TI2.

Sample and cuttings log. Well completed with casing 3.5 feet above ground.

Water Level				
Time				
Date				

Sampling Blowcounts: NOT APPLICABLE

RECOVERY feet

Depth feet: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27

Sample | Soil Sample Number

Graphic Soil Symbol | USCS Soil Symbol

Field Soil Description (all contacts uncertain within 0.1 feet).

USCS Soil Symbol	Field Soil Description
PT/CH	Dark brown 7.5 YR 3/2 root mat with clay.
ML	Dark yellowish brown 10YR 4/4 clayey silt.
CL	Dark grayish brown 4/2 silty clay. Faint petroleum odor.
CH	Dark grayish brown 4/2 plastic clay with vegetative remains.
CH	Dark greenish gray 10Y 3/1 very fine to fine sandy cplastic clay.
SC	Dark greenish gray 10Y 3/1 very clayey very fine to fine sand.
CH	Dark greenish gray 10Y 3/1 plastic clay.

First Encountered Water at 1.8 Feet.

Neat Cement Grout

Bentonite Seal

LONESTAR No. 3 Sand

T.D. = 15.25 Ft.

Total Well Depth = 14.8 Feet bgs.

Total Well Depth = 18.31 Feet brm.

(brm = below reference mark.)

(bgs = below nominal ground surface.)

1-inch PVC casing and screen.

screen openings = 0.020 inch

CENTRALIZER

H2OGEOL

A GROUND WATER CONSULTANCY

BOREHOLE LITHOLOGIC LOG

BOREHOLE No. TI1 Sheet 1 of 1

Project No.: Date: 01/23/02	Drilling Co. ASE Drilling Drill Model Iwan Auger
Client: Rhodia Inc., 100 Mococo Road, Martinez, CA	Drilling Method- Hand Operation Borehole Diameter 3.75-in
Location: east of Peyton Slough	Ground Surface Elevation Datum: ground surface
N 38° 2.132' W122° 6.760'	Borehole TI1 was completed as monitoring well TI1.
Logged by: GDL Driller: RCV/GDL	Sample and cuttings log. Well completed with casing 3.5 feet above ground.

Water Level				
Time				
Date				

Sampling Blowcounts: NOT ABLE

RECOVERY feet

Depth feet: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27

Sample

Soil Sample Number

Graphic Soil Symbol

USCS Soil Symbol	Field Soil Description (all contacts uncertain within 0.1 feet).
PT/CH	Dark brown 7.5 YR 3/2 root mat.
ML	Dark yellowish brown10YR4/4 vegetation remain rich silty clay/ clayey silt
CL	Very dark grayish brown 10YR 3/2 silty clay.
	First Encountered Water at 2.4 Feet. ▽
PT	Dark reddish brown 5YR 3/2 peat.
CH	Dark greenish gray 10YR 4/1 plastic clay.
	Neat Cement Grout
CH	Black 10YR 2/1 plastic clay with petroleum odor.
CH	Black 10YR 2/1 plastic clay with abundant vegetation remains (reed stems to 6± inches) and petroleum odor.
	As above but a fluidic solid/very viscous fluid.
	Loss of vegetative remains.
	Bentonite Seal
CH	Dark greenish gray 10Y 4/1 plastic clay.
	LONESTAR No. 3 Sand
	Total Well Depth = 15.0 Feet bgs.
	Total Well Depth = 18.54 Feet brm.
	(brm = below reference mark.)
	(bgs = below nominal ground surface.)

T.D. = 15.25 Ft.

1-inch PVC casing and screen.

screen openings = 0.020 inch

CENTRALIZER

Appendix D-2
Deep Core Boring Logs

Project: Rhodia, Inc.
Project Location: Martinez, California
Project Number: 51-00070007.00

Key to Log of Boring

Sheet 1 of 1

Elevation feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resistance, blows / foot	SAMPLES: Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10	11	12

COLUMN DESCRIPTIONS

1 **Elevation:** Elevation in feet referenced to mean sea level (MSL) or site datum.

2 **Depth:** Depth in feet below the ground surface.

3 **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.

4 **Sample Number:** Sample identification number.

5 **Sampling Resistance:** Number of blows to advance driven sampler 12 inches beyond first 6-inch interval, or distance noted, using a 140-lb hammer with a 30-inch drop; down-pressure for tube.

6 **Recovery:** Percentage of driven or pushed sample length recovered; "NA" indicates data not recorded.

7 **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.

8 **Material Description:** Description of material encountered; may include color, moisture, grain size, and density/consistency.

9 **Water Content:** Water content of soil sample measured in laboratory, expressed as percentage of dry weight of specimen.

10 **Dry Unit Weight:** Dry density of soil sample measured in laboratory, expressed in pounds per cubic feet (pcf).

11 **Unconfined Compressive Strength:** Unconfined compressive strength of soil sample measured in laboratory, expressed in psf.

12 **Remarks and Other Tests:** Comments and observations regarding drilling or sampling made by driller or field personnel. Other field and laboratory test results, using the following abbreviations:

HD	Hydrometer analysis; % < #200 sieve, % < 2 microns
LL	Liquid limit (Atterberg Limits test)
PI	Plasticity index (Atterberg Limits test)
PP	Pocket Penetrometer
SA	Sieve analysis, % < #200 sieve
TV	Tor Vane

TYPICAL MATERIAL GRAPHIC SYMBOLS

SAND (SP/SW)
LEAN CLAY (CL)
FAT CLAY (CH)
GRAVEL (GP/GW)
SILTY SAND (SM)
ORGANIC CLAY (OL)
ORGANIC CLAY (OH)
PEAT (PT)
CLAYEY SAND (SC)
SILT (ML)
SILT (MH)
SILTSTONE

TYPICAL SAMPLER GRAPHIC SYMBOLS

Modified California (2.5-inch OD)
Standard Penetration Test (SPT) split spoon
Standard Shelby tube (3-inch OD)
Small Shelby tube (2.5-inch OD)
California (3-inch OD)
Rock core barrel

OTHER GRAPHIC SYMBOLS

First water encountered at time of drilling and sampling (ATD)
Static water level measured in boring at specified time after drilling
Change in material properties within a lithologic stratum
--- Inferred contact between strata or gradational change in lithology

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive; actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Report: GEO_10B1_OAK_KEY_PSF; File: RHODIMAR.GPJ; 2/4/2002 hckey

URS

Project: Rhodia, Inc.
Project Location: Martinez, California
Project Number: 51-00070007.00

Log of Boring HC-1

Sheet 1 of 1

Date(s) Drilled	1/28/02	Logged By	J. Benton	Checked By	
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	6-inch OD auger bit	Total Depth of Borehole	15.0 feet
Drill Rig Type	Rhino	Drilling Contractor	Gregg Drilling & Testing	Surface Elevation	Not available
Groundwater Level and Date Measured	Not measured	Sampling Method(s)	Standard Shelby tube, SPT, Modified California	Hammer Data	Not applicable
Borehole Backfill	Drill cuttings (hole squeezed)	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0			Push	0		FAT CLAY (CH) / PEAT (PT) Very soft, wet(?), (color?), high plasticity				Start at 0900. Push SPT, Modified California, and Shelby tube samplers in upper 7 ft for soil characterization only; no samples retained.
				Push	0						
				Push	0						
	5						PEAT (PT)				
				Push	NA		FAT CLAY (CH) [Bay Mud] Very soft, wet, light grayish blue, high plasticity, with thin peaty layers				
	10		HC1-9	Push	100						
				Push	0						No sample recovery 11-13 ft.
			HC1-13	Push	NA						
	15						Bottom of boring at 15.0 feet				End drilling at 1020.
	20										
	25										
	30										

Report: GE _OAK; File: RHODIMAR.GPJ; 2/4/2002 HC-01

URS

Project: Rhodia, Inc.	Log of Boring HC-2
Project Location: Martinez, California	Sheet 1 of 1
Project Number: 51-00070007.00	

Date(s) Drilled	1/28/02	Logged By	J. Benton	Checked By	
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	6-inch OD auger bit	Total Depth of Borehole	13.0 feet
Drill Rig Type	Rhino	Drilling Contractor	Gregg Drilling & Testing	Surface Elevation	Not available
Groundwater Level and Date Measured	Not measured	Sampling Method(s)	Standard Shelby tube	Hammer Data	Not applicable
Borehole Backfill	Drill cuttings (hole squeezed)	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0						ORGANIC CLAY (OH) Very soft, moist, grayish blue, high plasticity, peat-like organics				Start at 1100.
				Push	NA		Layer of PEAT (PT), olive brown				Advance and extrude Shelby tube samplers in upper 8 ft for soil characterization only; no samples retained.
				Push	NA						
							PEAT (PT) Very soft(?), (moisture?), medium brown, highly organic, organic odor				
	5			Push	NA						
				Push	NA						
	10		HC2-9	Push	100						
			HC2-11	Push	100						
							Bottom of boring at 13.0 feet				
	15										
	20										
	25										
	30										

Report: G... .081_OAK; File: RHODIMAR.GPJ; 2/4/2002 HC-02

URS

Project: Rhodia, Inc. **Project Location:** Martinez, California **Project Number:** 51-00070007.00	**Log of Boring HC-3** Sheet 1 of 1

Date(s) Drilled	1/28/02	Logged By	J. Benton	Checked By	
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	6-inch OD auger bit	Total Depth of Borehole	15.0 feet
Drill Rig Type	Rhino	Drilling Contractor	Gregg Drilling & Testing	Surface Elevation	Not available
Groundwater Level and Date Measured	Not measured	Sampling Method(s)	Standard Shelby tube, SPT, Modified California	Hammer Data	Not applicable
Borehole Backfill	Drill cuttings (hole squeezed)	Location	Station 18+43, 24 feet from centerline of road; refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0			Push	NA		PEAT (PT) Very soft, (moisture?), dark brown, highly organic, with clay				Start at 1145.
				Push	NA						Advance and extrude Shelby tube samplers in upper 8 ft for soil characterization only; no samples retained.
	5			Push	NA		ORGANIC CLAY (OH) [Bay Mud] Very soft, moist, bluish gray, high plasticity				
				Push	NA		PEAT (PT) Very soft(?), (moisture?), dark brown, highly organic, organic odor, with clay				
	10		HC3-9	Push	75						
				Push	0						No sample recovery 11-13 ft.
			HC3-13	Push	100		FAT CLAY (CH) / ORGANIC CLAY (OH) Very soft, wet, bluish gray, high plasticity				
	15						Bottom of boring at 15.0 feet				End drilling at 1235.
	20										
	25										
	30										

Report: GEO_rvd1_OAK; File: RHODIMAR.GPJ; 2/4/2002 HC-03

URS

Project: Rhodia, Inc.
Project Location: Martinez, California
Project Number: 51-00070007.00

Log of Boring HC-4

Sheet 1 of 1

Date(s) Drilled	1/28/02	Logged By	J. Benton	Checked By	
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	6-inch OD auger bit	Total Depth of Borehole	13.0 feet
Drill Rig Type	Rhino	Drilling Contractor	Gregg Drilling & Testing	Surface Elevation	Not available
Groundwater Level and Date Measured	Not measured	Sampling Method(s)	Standard Shelby tube, Modified California	Hammer Data	Not applicable
Borehole Backfill	Drill cuttings (hole squeezed)	Location	Station 8+00; refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0			Push	100		ORGANIC CLAY (OH) Soft, moist, medium brown, high plasticity, abundant peat-like organics and roots				Push Shelby tube and Modified California samplers in upper 9 ft only to characterize soil; no samples retained.
				Push	100		FAT CLAY (CH) Very soft, wet, bluish gray, high plasticity, trace to some peat-like organics and roots				
				Push	50						
	5			Push	NA						
				Push	NA						
							Increasing organic content				
	10		HC4-9	Push	50						
			HC4-11	Push	90		ORGANIC CLAY (OH) Very soft, wet, bluish gray, high plasticity, abundant peat-like organics and roots				
							Bottom of boring at 13.0 feet				End drilling at 1400.
	15										
	20										
	25										
	30										

URS

Appendix D-3
Hydraulic Conductivity Laboratory Results

SUMMARY OF LABORATORY PERMEABILITY TESTS PERFORMED ON THIN-WALLED TUBE SAMPLES

BORING NO.	SPECIFIC GRAVITY / USCS SYMBOL	WATER CONTENTS INITIAL / PRE-TEST (%)	TOTAL BULK DENSITY INITIAL / PRE-TEST (pcf)	DRY BULK DENSITY INITIAL / PRE-TEST (pcf)	TOTAL POROSITY	STRESSES EFFECTIVE / BACK PRESSURE (psi)	DURING CONSOL. TIME / VOLUMETRIC STRAIN (days, %)	DURING TEST PERMEANT / INITIAL GRADIENT	COEFFICIENT OF PERM. K, (@ 20 C) (cm/sec)	DIRECTION OF PERMEATION	REMARKS
T1-1		54.1	92.7	60.2		5.0	3	tap water	2.1E-4	horizontal	P6264
	CL-ML	59.9	103.4	64.7		100.0	0.1	6			
T1-2		83.4	92.4	50.4		5.0	3	tap water	1.6E-7	horizontal	P6265
	CL	72.7	98.9	57.3		100.0	12.1	23			
HEW-0	2.636	125.4	83.1	36.8	0.78	5.0	3	tap water	2.7E-7	vertical	P6268
	CH	98.1	90.9	45.9	0.72	100.0	19.7	20			
HEW-0		101.4	84.7	42.1	0.74	5.0	over night	tap water	2.1E-6	horizontal	P6276
		100.0	90.5	45.3	0.72	100.0	7.0	22			
HEW-2	2.426	197.7	75.1	25.2	0.83	5.0	3	tap water	1.7E-7	vertical	P6269
	CH	130.4	83.8	36.4	0.76	100.0	30.6	23			
HEW-2		172.9	75.3	27.6	0.82	5.0	over night	tap water	2.4E-7	horizontal	P6277
		164.3	80.3	30.4	0.80	100.0	9.1	24			
HEW-6	2.295	164.1	73.6	27.9	0.81	5.0	3	tap water	1.1E-7	vertical	P6271
	OH	112.8	85.0	39.9	0.72	100.0	30.2	20			
HEW-6		143.9	75.6	31.0	0.78	5.0	over night	tap water	1.5E-7	horizontal	P6275
		146.9	80.9	32.8	0.77	100.0	5.4	26			
MW-3A	2.695	17.6	130.0	110.6	0.34	5.0	3	tap water	1.6E-6	vertical	P6267
	SM	17.7	134.1	113.9	0.32	100.0	2.9	18			
MW-3A		17.8	130.7	110.9	0.34	5.0	over night	tap water	2.9E-6	horizontal	P6273
		18.3	133.3	112.7	0.33	100.0	1.6	19			
MW-4A	2.669	16.1	124.7	107.5	0.35	5.0	3	tap water	8.8E-7	vertical	P6270
	SM	18.9	131.6	110.7	0.34	100.0	2.9	18			
MW-4A		18.7	127.7	107.6	0.35	5.0	over night	tap water	2.9E-5	horizontal	P6274
		20.3	130.0	108.1	0.35	100.0	0.4	15			
MW-62	2.690	58.7	100.9	63.5	0.62	5.0	3	tap water	9.5E-6	vertical	P6266
	CH	58.8	103.3	65.1	0.61	100.0	2.3	16			
MW-62		60.0	100.4	62.7	0.63	5.0	over night	tap water	1.2E-7	horizontal	P6272
		60.0	102.8	64.2	0.62	100.0	2.4	22			

Prepared by: RV Reviewed by: CMJ Date: 01/25/2002

CONSTANT HEAD HYDRAULIC CONDUCTIVITY TEST
ASTM D 5084 - 90

Project No. **51-00070007** BORING: TI-1
Project Name: **Example** SAMPLE: horizontal DEPTH (ft): Test No.: **P6264**

Specimen - Apparatus set-up - Test Information Apparatus No. C-2 Cell No. H-6 Stage 2

1) Specimen Tested in : [x] Triaxial Cell or [ ] Compaction Mold or
[ ] with stones or [ ] Stones with filter paper or [ ] top + bottom
2) Specimen orientation for: [x] Vertical or [ ] Horizontal permeability determination
3) During saturation: Water flushed up sides of specimen to remove air: [x] No [ ] Yes
4) During consolidation: [x] Top and bottom drainage or [ ] Top [ ] Bottom only
5) Direction of permeant : [x] Up during or [ ] Down during permeation
6) Permeant: water used [x] Tap [ ] Distilled
[ ] Demineralized [ ] 0.005 N calcium sulfate (CaSO4)

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	Dial Indicator in	Pressure Head Reading Mercury (inch)	Pressure Head Reading Gage (psi)	Flow Reading (cm)	Flow Vol (cm3) Rate (cm3/sec)	Fluid Head Reading Head (cm)	Fluid Head Reading Tail (cm)	Total Head Uncorrected / Correction / Corrected (cm)	Gradient	Permeability Preliminary / Final at 20°C cm/sec
initial	22.5	1/21/02	13	07	00	105.0	100.0	0.131			3.70	26.884	72.85	37.10	35.75		
final	22.5	1/21/02	13	25	42						5.00	0.0240	72.85	37.10	3.23		2.34E-04
1	RT = 0.941	dT =		18.70 min		σ'_c =	0.7 ksf						72.85	37.1	32.52	5.55	2.27E-04
initial	22.5	1/21/02	13	26	00	105.0	100.0	0.131			3.50	28.952	72.85	37.10	35.75		
final	22.5	1/21/02	13	47	30						4.90	0.0224	72.85	37.10	3.03		2.18E-04
2	RT = 0.941	dT =		21.50 min		σ'_c =	0.7 ksf						72.85	37.1	32.72	5.59	2.11E-04
initial	22.5	1/21/02	13	50	00	105.0	100.0	0.131			3.60	31.02	72.85	37.10	35.75		
final	22.5	1/21/02	14	13	00						5.10	0.0225	72.85	37.10	3.03		2.18E-04
3	RT = 0.941	dT =		23.00 min		σ'_c =	0.7 ksf						72.85	37.1	32.72	5.59	2.12E-04
initial	22.5	1/21/02	14	16	00	105.0	100.0	0.131			3.50	37.224	72.85	37.10	35.75		
final	22.5	1/21/02	14	44	00						5.30	0.0222	72.85	37.10	2.99		2.15E-04
4	RT = 0.941	dT =		28.00 min		σ'_c =	0.7 ksf						72.85	37.1	32.76	5.59	2.08E-04

Preliminary Length/Area Calculations

Lo =	2.337	in	Lo=	5.936	cm
Ao=	2.939	in^2	Ao =	18.96	cm^2
Vo=	6.869	in^3	Vo =	112.56	cm^3
Lc =	5.857	cm	Vc =	108.08	cm^3
Ac=	18.453	cm^2			

Tested By: DT Reviewed By: G. Thomas

TEST SUMMARY

Final Specimen and Test Conditions

Lc = 5.857 cm ε_{axial} = 1.3%
Ac = 17.878 cm^2
Vc= 104.72 cm^3 ε_{vol} = 7.0%

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	54.10	92.7	60.2	80.6
PreTest	59.92	103.4	64.7	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4
ave K @ 20 °C: **2.15E-04** cm/sec
(i_c)ave = 5.59

HYDRAULIC CONDUCTIVITY TEST

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: T1-2 | Test No.: P6265

Project Name: | SAMPLE: horizontal | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. H-5 | Apparatus No. 8 | Stage No.: 2

Preliminary Length/Area Calculations

Lo =	2.170	in	Lo=	5.511	cm
dLc=	0.101	in	Ao =	18.94	cm^2
Lc=	2.069	in	Vo =	104.39	cm^3
			Lc=	5.256	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	14.51	cm^3
			Vc =	89.88	cm^3
Sc =	0.307	cm^{-1}	Ac=	17.103	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or	
	x	with stones or		Stones with filter paper or	top + bottom
2) Specimen orientation for;		Vertical or	x	Horizontal permeability determination	
3) During saturation: Water flushed up sides of specimen to remove a			x	No	Yes
4) During consolidation:	x	Top and bottom drainage or		Top	Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation	
6) Permeant: water used	x	Tap		Distilled	
or		Demineralized		0.005 N calcium sulfate (CaSO4)	

Equations Used

Kt = - 0.0000785 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.3507

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.7	1/21/02	09	45	00	105.0	100.0	55.28	46.20	1.05	1.74E-07
final	22.7	1/21/02	11	06	00			52.30	47.20		1.60E-07
1	RT = 0.938	dT =		81.00 min		σ'_c =	0.7 ksf	0.238	0.228	io= 21.7	1%
initial	22.7	1/21/02	11	07	00	105.0	100.0	55.71	46.04	0.97	1.77E-07
final	22.7	1/21/02	11	56	00			53.55	46.82		1.63E-07
2	RT = 0.938	dT =		49.00 min		σ'_c =	0.7 ksf	0.173	0.178	io= 23.1	3%
initial	22.7	1/21/02	11	58	00	105.0	100.0	56.20	45.90	0.97	1.69E-07
final	22.5	1/21/02	13	02	00			53.45	46.89		1.55E-07
3	RT = 0.941	dT =		64.00 min		σ'_c =	0.7 ksf	0.220	0.226	io= 24.6	-2%
initial	22.5	1/21/02	13	04	00	105.0	100.0	55.95	45.96	0.97	1.67E-07
final	22.5	1/21/02	14	00	00			53.57	46.82		1.55E-07
4	RT = 0.943	dT =		56.00 min		σ'_c =	0.7 ksf	0.190	0.196	io= 23.9	-2%
initial											
final											
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	5.256	cm	ε_{axial} =	4.6%
Ac =	17.454	cm^2		
Vc=	91.73	cm^3	ε_{vol} =	12.1%
Sc =	0.301	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	83.39	92.4	50.4	95.1
PreTest	72.66	98.9	57.3	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **1.58E-07** cm/sec

(i_o)ave = 23.3

Tested By: DT | Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: HEW-0 | Test No.: P6268

Project Name: | SAMPLE: vertical | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. 1 | Apparatus No. 3 | Stage No.: 2

Preliminary Length/Area Calculations

Lo =	4.044	in	Lo=	10.272	cm
dLc=	0.289	in	Ao =	41.41	cm^2
Lc=	3.755	in	Vo =	425.33	cm^3
			Lc=	9.538	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	91.19	cm^3
			Vc =	334.15	cm^3
Sc =	0.272	cm^{-1}	Ac=	35.034	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or
	x	with stones or		Stones with filter paper or _____ top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination
3) During saturation: Water flushed up sides of specimen to remove a	x	No		Yes
4) During consolidation:	x	Top and bottom drainage or		Top / Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation
6) Permeant: water used	x	Tap		Distilled
or		Demineralized		0.005 N calcium sulfate (CaSO4)

Equations Used

Kt = - 0.0000756 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.316

Consol Stage- Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.2	1/21/02	13	27	00	105.0	100.0	63.10	48.20	1.00	2.95E-07
final	22.2	1/21/02	13	46	00			60.40	49.05		2.74E-07
1	RT = 0.951	dT =		19.00 min		σ'_c =	0.7 ksf	0.203	0.202	io= 19.6	1%
initial	22.2	1/21/02	13	47	00	105.0	100.0	63.70	48.03	1.02	2.83E-07
final	22.3	1/21/02	14	24	00			58.95	49.50		2.63E-07
2	RT = 0.949	dT =		37.00 min		σ'_c =	0.7 ksf	0.356	0.349	io= 20.7	-3%
initial	22.3	1/21/02	14	24	00	105.0	100.0	63.70	48.03	1.02	3.08E-07
final	22.3	1/21/02	14	42	00			60.89	48.90		2.86E-07
3	RT = 0.948	dT =		18.00 min		σ'_c =	0.7 ksf	0.211	0.207	io= 20.7	5%
initial	22.3	1/21/02	14	44	00	105.0	100.0	63.70	48.03	1.04	2.87E-07
final	22.1	1/21/02	15	09	00			60.20	49.09		2.66E-07
4	RT = 0.951	dT =		25.00 min		σ'_c =	0.7 ksf	0.263	0.252	io= 20.7	-2%
initial											
final											
5		dT =		0.00 min		σ'_c =		0.000	0.000		
initial											
final											
6		dT =		0.00 min		σ'_c =		0.000	0.000		

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	9.538	cm	ε_{axial} =	7.1%
Ac =	35.811	cm^2		
Vc=	341.55	cm^3	ε_{vol} =	19.7%
Sc =	0.266	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	125.44	83.1	36.8	95.4
PreTest	98.13	90.9	45.9	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **2.72E-07** cm/sec

(i_o)ave = 20.4

Tested By: DT | Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: HEW-0 | Test No.: P6276

Project Name: | SAMPLE: horizontal | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. 2 | Apparatus No. 3 | Stage No.: 2

Preliminary Length/Area Calculations

Lo =	2.145	in	Lo=	5.448	cm
dLc=	0.062	in	Ao =	19.06	cm^2
Lc=	2.083	in	Vo =	103.84	cm^3
			Lc=	5.292	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	8.93	cm^3
			Vc =	94.91	cm^3
Sc =	0.295	cm^{-1}	Ac=	17.935	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or	
	x	with stones or		Stones with filter paper or	top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination	
3) During saturation: Water flushed up sides of specimen to remove a			x	No	Yes
4) During consolidation:	x	Top and bottom drainage or		Top	Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation	
6) Permeant: water used	x	Tap		Distilled	
or		Demineralized		0.005 N calcium sulfate (CaSO4)	

Equations Used

Kt = - 0.0000756 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.316

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.2	1/22/02	10	20	00	105.0	100.0	59.00	49.58	1.10	2.18E-06
final	22.2	1/22/02	10	24	44			56.35	50.34		2.04E-06
1	RT = 0.951	dT =		4.73 min		σ'_c =	0.7 ksf	0.199	0.180	io= 22.4	-1%
initial	22.2	1/22/02	10	25	00	105.0	100.0	59.00	49.58	1.16	2.18E-06
final	22.2	1/22/02	10	28	45			56.80	50.18		2.04E-06
2	RT = 0.951	dT =		3.75 min		σ'_c =	0.7 ksf	0.165	0.142	io= 22.4	-1%
initial	22.2	1/22/02	10	30	00	105.0	100.0	59.00	49.58	1.11	2.22E-06
final	22.2	1/22/02	10	34	19			56.50	50.29		2.07E-06
3	RT = 0.951	dT =		4.32 min		σ'_c =	0.7 ksf	0.188	0.169	io= 22.4	1%
initial	22.2	1/22/02	10	35	00	105.0	100.0	59.00	49.58	1.11	2.22E-06
final	22.2	1/22/02	10	39	19			56.50	50.29		2.07E-06
4	RT = 0.951	dT =		4.32 min		σ'_c =	0.7 ksf	0.188	0.169	io= 22.4	1%
initial											
final											
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	5.292	cm	ε_{axial} =	2.9%
Ac =	18.248	cm^2		
Vc=	96.56	cm^3	ε_{vol} =	7.0%
Sc =	0.290	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	101.36	84.7	42.1	91.8
PreTest	100.00	90.5	45.3	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **2.06E-06** cm/sec

(i_o)ave = 22.4

Tested By: DT | Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: HEW-2 | Test No.: P6269

Project Name: | SAMPLE: vertical | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. 6 | Apparatus No. 4 | Stage No.: 2

Preliminary Length/Area Calculations

Lo =	4.019	in	Lo=	10.207	cm
dLc=	0.281	in	Ao =	41.58	cm^2
Lc=	3.738	in	Vo =	424.39	cm^3
			Lc=	9.494	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	89.03	cm^3
			Vc =	335.36	cm^3
Sc =	0.269	cm^{-1}	Ac=	35.325	cm^2

1) Specimen Tested in :	x	Triaxial Cell or	Compaction Mold or
	x	with stones or	Stones with filter paper or ____ top + bottom
2) Specimen orientation for:	x	Vertical or	Horizontal permeability determination
3) During saturation: Water flushed up sides of specimen to remove a	x	No	Yes
4) During consolidation:	x	Top and bottom drainage or	Top / Bottom only
5) Direction of permeant :	x	Up during or	Down during permeation
6) Permeant: water used	x	Tap	Distilled
or		Demineralized	0.005 N calcium sulfate (CaSO4)

Equations Used

Kt = - 0.0000773 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.3133

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.5	1/22/02	11	15	00	105.0	100.0	62.00	44.93	0.83	1.76E-07
final	22.5	1/22/02	11	36	11			59.87	45.73		1.89E-07
4	RT = 0.943	dT =		21.18 min		σ'_c =	0.7 ksf	0.163	0.196	io= 22.6	11%
initial	22.5	1/22/02	11	43	00	105.0	100.0	62.00	44.93	0.86	1.67E-07
final	22.5	1/22/02	12	06	00			59.80	45.73		1.80E-07
5	RT = 0.943	dT =		23.00 min		σ'_c =	0.7 ksf	0.168	0.196	io= 22.6	6%
initial	22.5	1/22/02	12	07	00	105.0	100.0	62.00	44.93	0.86	1.40E-07
final	22.4	1/22/02	12	45	34			59.03	46.01		1.50E-07
6	RT = 0.945	dT =		38.57 min		σ'_c =	0.7 ksf	0.227	0.264	io= 22.6	-12%
initial	22.4	1/22/02	12	52	00	105.0	100.0	62.00	44.93	0.84	1.52E-07
final	22.4	1/22/02	13	22	11			59.43	45.89		1.63E-07
7	RT = 0.946	dT =		30.18 min		σ'_c =	0.7 ksf	0.197	0.235	io= 22.6	-4%
initial											
final											
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	9.494	cm	ε_{axial} =	7.0%
Ac =	31.003	cm^2		
Vc=	294.32	cm^3	ε_{vol} =	30.6%
Sc =	0.306	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	197.74	75.1	25.2	95.9
PreTest	130.41	83.8	36.4	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 4-7

ave K @ 20 °C: **1.71E-07** cm/sec

(i_o)ave = 22.6

Tested By: DT Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: HEW-2 | Test No.: P6277

Project Name: | SAMPLE: horizontal | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. 2 | Apparatus No. 1 | Stage No.: 2

Preliminary Length/Area Calculations

Lo =	1.820	in	Lo=	4.623	cm
dLc=	0.090	in	Ao =	18.85	cm^2
Lc=	1.730	in	Vo =	87.15	cm^3
			Lc=	4.395	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	12.93	cm^3
			Vc =	74.22	cm^3
Sc =	0.260	cm^{-1}	Ac=	16.889	cm^2

Equations Used

Kt = - 0.0000760 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.319

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	4.395	cm	ε_{axial} =	4.9%
Ac =	18.022	cm^2		
Vc=	79.20	cm^3	ε_{vol} =	9.1%
Sc =	0.244	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	172.85	75.3	27.6	93.5
PreTest	164.34	80.3	30.4	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 2-5

ave K @ 20 °C: **2.45E-07** cm/sec

(i_o)ave = 23.7

Tested By: DT | Reviewed By: G. Thomas

1) Specimen Tested in : [x] Triaxial Cell or [ ] Compaction Mold or
[x] with stones or [ ] Stones with filter paper or top + bottom
2) Specimen orientation for: [ ] Vertical or [x] Horizontal permeability determination
3) During saturation: Water flushed up sides of specimen to remove a [x] No [ ] Yes
4) During consolidation: [x] Top and bottom drainage or [ ] Top [ ] Bottom only
5) Direction of permeant : [x] Up during or [ ] Down during permeation
6) Permeant: water used [x] Tap [ ] Distilled
or [ ] Demineralized [ ] 0.005 N calcium sulfate (CaSO4)

Consol Stage-Trial No.	Temp. °C	Date	Time hr	min	sec	Initial σ_c psi	Ub psi	U-tube Reading Head (cm) (cc)	Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.5	1/23/02	09	14	00	105.0	100.0	51.22	42.91	1.01	3.29E-07
final	22.5	1/23/02	09	31	00			49.67	43.40		2.90E-07
1	RT = 0.943	dT =		17.00 min		σ'_c =	0.7 ksf	0.117	0.116	io= 23.8	19%
initial	22.5	1/23/02	09	32	00	105.0	100.0	50.90	43.02	1.00	2.86E-07
final	22.5	1/23/02	09	57	00			49.09	43.60		2.52E-07
2	RT = 0.943	dT =		25.00 min		σ'_c =	0.7 ksf	0.137	0.137	io= 22.5	3%
initial	22.5	1/23/02	09	58	00	105.0	100.0	51.20	42.92	1.00	2.80E-07
final	22.4	1/23/02	10	22	00			49.39	43.50		2.48E-07
3	RT = 0.945	dT =		24.00 min		σ'_c =	0.7 ksf	0.137	0.137	io= 23.7	1%
initial	22.4	1/23/02	10	24	00	105.0	100.0	51.36	42.89	1.04	2.70E-07
final	22.3	1/23/02	10	47	00			49.63	43.42		2.40E-07
4	RT = 0.947	dT =		23.00 min		σ'_c =	0.7 ksf	0.131	0.126	io= 24.2	-2%
initial	22.3	1/23/02	10	51	00	105.0	100.0	51.34	42.90	1.01	2.68E-07
final	22.2	1/23/02	11	16	00			49.50	43.48		2.39E-07
5	RT = 0.949	dT =		25.00 min		σ'_c =	0.7 ksf	0.139	0.137	io= 24.1	-2%
initial											
final											
6											

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: HEW-6 | Test No.: P6271

Project Name: | SAMPLE: vertical | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. 2 | Apparatus No. 2 | Stage No.: 2

Preliminary Length/Area Calculations

Lo =	3.733	in	Lo=	9.483	cm
dLc=	0.433	in	Ao =	40.91	cm^2
Lc=	3.300	in	Vo =	387.92	cm^3
			Lc=	8.383	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	134.97	cm^3
			Vc =	252.95	cm^3
Sc =	0.278	cm^{-1}	Ac=	30.174	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or	
	x	with stones or		Stones with filter paper or	top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination	
3) During saturation: Water flushed up sides of specimen to remove a			x	No		Yes
4) During consolidation:	x	Top and bottom drainage or		Top		Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation	
6) Permeant: water used	x	Tap		Distilled	
or		Demineralized		0.005 N calcium sulfate (CaSO4)	

Equations Used

Kt = - 0.0000752 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.322

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.3	1/21/02	09	33	00	105.0	100.0	58.70	46.10	0.97	1.37E-07
final	22.3	1/21/02	10	01	00			57.10	46.63		1.21E-07
1	RT = 0.948	dT =		28.00 min		σ'_c =	0.7 ksf	0.120	0.123	io= 18.9	6%
initial	22.3	1/21/02	10	02	00	105.0	100.0	59.15	45.98	1.00	1.24E-07
final	22.3	1/21/02	10	52	00			56.60	46.80		1.09E-07
2	RT = 0.948	dT =		50.00 min		σ'_c =	0.7 ksf	0.191	0.191	io= 19.8	-5%
initial	22.3	1/21/02	10	54	00	105.0	100.0	59.15	45.98	1.11	1.37E-07
final	22.3	1/21/02	11	18	00			57.70	46.40		1.21E-07
3	RT = 0.948	dT =		24.00 min		σ'_c =	0.7 ksf	0.109	0.098	io= 19.8	6%
initial	22.3	1/21/02	11	19	00	105.0	100.0	59.36	45.90	0.97	1.22E-07
final	22.3	1/21/02	11	46	00			57.88	46.39		1.08E-07
4	RT = 0.948	dT =		27.00 min		σ'_c =	0.7 ksf	0.111	0.114	io= 20.2	-6%
initial											
final											
		dT =		0.00 min		σ'_c =		0.000	0.000		
initial											
final											
		dT =		0.00 min		σ'_c =		0.000	0.000		

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	8.383	cm	ε_{axial} =	11.6%
Ac =	32.292	cm^2		
Vc=	270.70	cm^3	ε_{vol} =	30.2%
Sc =	0.260	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	164.11	73.6	27.9	90.9
PreTest	112.77	85.0	39.9	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **1.15E-07** cm/sec

(i_o)ave = 19.6

Tested By: DT | Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: HEW-6 | Test No.: P6275

Project Name: | SAMPLE: horizontal | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. H-6 ✓ | Apparatus No. 2 ✓ | Stage No.: 2 ✓

Preliminary Length/Area Calculations

Lo =	1.890	in	Lo=	4.802	cm
dLc=	0.067	in	Ao =	18.89	cm^2
Lc=	1.824	in	Vo =	90.72	cm^3
			Lc=	4.633	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	9.57	cm^3
			Vc =	81.15	cm^3
Sc =	0.264	cm^{-1}	Ac=	17.516	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or	
	x	with stones or		Stones with filter paper or	top + bottom
2) Specimen orientation for:		Vertical or	x	Horizontal permeability determination	
3) During saturation: Water flushed up sides of specimen to remove a			x	No	Yes
4) During consolidation:	x	Top and bottom drainage or		Top	Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation	
6) Permeant: water used	x	Tap		Distilled	
or		Demineralized		0.005 N calcium sulfate (CaSO4)	

Equations Used

Kt = - 0.0000752 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.322

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.2	1/22/02	10	16	00	105.0	100.0	55.77	47.06	1.03	1.68E-07
final	22.2	1/22/02	10	40	14			54.55	47.44		1.51E-07
1	RT = 0.951	dT =		24.23 min		σ'_c =	0.7 ksf	0.091	0.088	io= 23.6	2%
initial	22.2	1/22/02	10	41	00	105.0	100.0	56.60	46.79	0.94	1.67E-07
final	22.2	1/22/02	11	10	00			55.00	47.34		1.50E-07
2	RT = 0.951	dT =		29.00 min		σ'_c =	0.7 ksf	0.120	0.128	io= 26.6	1%
initial	22.2	1/22/02	11	13	00	105.0	100.0	56.70	46.77	0.96	1.63E-07
final	22.2 ✓	1/22/02	11	44	51			54.97	47.35		1.47E-07
3	RT = 0.951	dT =		31.85 min		σ'_c =	0.7 ksf	0.130	0.135	io= 26.9	-1%
initial	22.2	1/22/02	11	47	00	105.0	100.0	56.75	46.75	0.97	1.64E-07
final	22.2	1/22/02	12	12	51			55.30	47.23		1.47E-07
4	RT = 0.951	dT =		25.85 min		σ'_c =	0.7 ksf	0.109	0.112	io= 27.1	-1%
initial											
final											
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	4.633	cm	ε_{axial} =	3.5%
Ac =	18.523	cm^2		
Vc=	85.81	cm^3	ε_{vol} =	5.4%
Sc =	0.250	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	143.92	75.6	31.0	91.2
PreTest	146.94	80.9	32.8	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **1.49E-07** cm/sec

(i_o)ave = 26.1

Tested By: DT | Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: MW-3A | Test No.: P6267

Project Name: | SAMPLE: vertical | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. 4 | Apparatus No. 1 | Stage No.: 2

Preliminary Length/Area Calculations

Lo =	4.006	in	Lo=	10.176	cm
dLc=	0.048	in	Ao =	41.56	cm^2
Lc=	3.958	in	Vo =	422.90	cm^3
			Lc=	10.054	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	15.20	cm^3
			Vc =	407.70	cm^3
Sc =	0.248	cm^{-1}	Ac=	40.550	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or	
	x	with stones or		Stones with filter paper or	top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination	
3) During saturation: Water flushed up sides of specimen to remove a	x	No		Yes	
4) During consolidation:	x	Top and bottom drainage or		Top	Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation	
6) Permeant: water used	x	Tap		Distilled	
or		Demineralized		0.005 N calcium sulfate (CaSO4)	

Equations Used

Kt = - 0.0000760 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.319

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.4	1/21/02	10	35	00	105.0	100.0	55.90	41.38	1.00	1.65E-06
final	22.4	1/21/02	10	44	00			49.90	43.30		1.55E-06
1	RT = 0.946	dT =		9.00 min		σ'_c =	0.7 ksf	0.454	0.455	io= 18.2	0%
initial	22.4	1/21/02	10	45	00	105.0	100.0	55.90	41.38	1.00	1.65E-06
final	22.4	1/21/02	10	59	00			48.12	43.87		1.55E-06
2	RT = 0.946	dT =		14.00 min		σ'_c =	0.7 ksf	0.588	0.590	io= 18.2	0%
initial	22.4	1/21/02	11	00	00	105.0	100.0	55.90	41.38	1.00	1.65E-06
final	22.4	1/21/02	11	11	00			49.10	43.55		1.55E-06
3	RT = 0.946	dT =		11.00 min		σ'_c =	0.7 ksf	0.514	0.514	io= 18.2	0%
initial	22.4	1/21/02	11	12	00	105.0	100.0	55.90	41.38	0.99	1.66E-06
final	22.4	1/21/02	11	24	00			48.72	43.70		1.56E-06
4	RT = 0.946	dT =		12.00 min		σ'_c =	0.7 ksf	0.543	0.550	io= 18.2	0%
initial											
final											
		dT =		0.00 min		σ'_c =		0.000	0.000		
initial											
final											
		dT =		0.00 min		σ'_c =		0.000	0.000		

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	10.054	cm	ε_{axial} =	1.2%
Ac =	40.828	cm^2		
Vc=	410.49	cm^3	ε_{vol} =	2.9%
Sc =	0.246	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	17.58	130.0	110.6	90.8
PreTest	17.71	134.1	113.9	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **1.55E-06** cm/sec

(i_o)ave = 18.2

Tested By: DT | Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: MW-3A | Test No.: P6273

Project Name: | SAMPLE: horizontal | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. H-5 ✓ | Apparatus No. 8 ✓ | Stage No.: 2 ✓

Preliminary Length/Area Calculations

Lo =	2.230	in	Lo=	5.663	cm
dLc=	0.017	in	Ao =	18.95	cm^2
Lc=	2.213	in	Vo =	107.33	cm^3
			Lc=	5.620	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	2.46	cm^3
			Vc =	104.88	cm^3
Sc =	0.301	cm^{-1}	Ac=	18.661	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or		
	x	with stones or		Stones with filter paper or		top + bottom
2) Specimen orientation for:		Vertical or	x	Horizontal permeability determination		
3) During saturation: Water flushed up sides of specimen to remove a	x	No		Yes		
4) During consolidation:	x	Top and bottom drainage or		Top		Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation		
6) Permeant: water used	x	Tap		Distilled		
or		Demineralized		0.005 N calcium sulfate (CaSO4)		

Equations Used

Kt = - 0.0000785 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.3507

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.5	1/22/02	10	32	00	105.0	100.0	55.00	46.38 ✓	1.01	3.07E-06
final	22.5	1/22/02	10	35	50			52.50	47.25		2.87E-06
1	RT = 0.943	dT =		3.83 min ✓		σ'_c =	0.7 ksf	0.200	0.198	io= 19.3	-2%
initial	22.5	1/22/02	10	37	00	105.0	100.0	55.00	46.38 ✓	1.04	3.06E-06
final	22.5	1/22/02	10	44	00			51.20	47.66		2.86E-06
2	RT = 0.943	dT =		7.00 min ✓		σ'_c =	0.7 ksf	0.304	0.292	io= 19.3	-3%
initial	22.5 ✓	1/22/02	10	45	00	105.0	100.0	55.00	46.38 ✓	1.00	3.24E-06
final	22.5	1/22/02	10	49	38			52.00	47.43		3.03E-06
3	RT = 0.943	dT =		4.63 min ✓		σ'_c =	0.7 ksf	0.240	0.239	io= 19.3	3%
initial	22.5	1/22/02	10	51	00	105.0	100.0	55.00	46.38 ✓	1.00	3.19E-06
final	22.5	1/22/02	10	55	42			52.00	47.43		2.99E-06
4	RT = 0.943	dT =		4.70 min		σ'_c =	0.7 ksf	0.240	0.239	io= 19.3	2%
initial											
final											
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	5.620	cm	ε_{axial} =	0.8%
Ac =	18.795	cm^2		
Vc=	105.63	cm^3	ε_{vol} =	1.6%
Sc =	0.299	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	17.82	130.7	110.9	92.9
PreTest	18.30	133.3	112.7	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **2.94E-06** cm/sec

(i_o)ave = 19.3

Tested By: DT | Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: MW-4A | Test No.: P6270

Project Name: | SAMPLE: vertical | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. P-3 | Apparatus No. 4 | Stage No.: 2

Preliminary Length/Area Calculations

Lo =	4.011	in	Lo=	10.188	cm
dLc=	0.062	in	Ao =	41.74	cm^2
Lc=	3.949	in	Vo =	425.28	cm^3
			Lc=	10.031	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	19.72	cm^3
			Vc =	405.56	cm^3
Sc =	0.248	cm^{-1}	Ac=	40.431	cm^2

1) Specimen Tested in : [x] Triaxial Cell or [ ] Compaction Mold or
[x] with stones or [ ] Stones with filter paper or ____ top + bottom
2) Specimen orientation for: [x] Vertical or [ ] Horizontal permeability determination
3) During saturation: Water flushed up sides of specimen to remove a [x] No [ ] Yes
4) During consolidation: [x] Top and bottom drainage or [ ] Top [ ] Bottom only
5) Direction of permeant : [x] Up during or [ ] Down during permeation
6) Permeant: water used [x] Tap [ ] Distilled
or [ ] Demineralized [ ] 0.005 N calcium sulfate (CaSO4)

Equations Used

Kt = - 0.0000773 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.3133

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.5	1/21/02	11	17	00	105.0	100.0	60.00	45.65	1.03	9.46E-07
final	22.5	1/21/02	11	23	00			57.20	46.50		8.76E-07
1	RT = 0.943	dT =		6.00 min		σ'_c =	0.7 ksf	0.214	0.208	io= 18.0	-1%
initial	22.5	1/21/02	11	24	00	105.0	100.0	60.00	45.65	1.00	9.59E-07
final	22.5	1/21/02	11	34	00			55.70	47.00		8.88E-07
2	RT = 0.943	dT =		10.00 min		σ'_c =	0.7 ksf	0.329	0.330	io= 18.0	1%
initial	22.5	1/21/02	11	36	00	105.0	100.0	60.00	45.65	0.98	9.41E-07
final	22.5	1/21/02	11	45	00			56.10	46.90		8.71E-07
3	RT = 0.943	dT =		9.00 min		σ'_c =	0.7 ksf	0.299	0.306	io= 18.0	-1%
initial	22.5	1/21/02	11	46	00	105.0	100.0	60.00	45.65	0.98	9.61E-07
final	22.5	1/21/02	11	54	00			56.39	46.80		8.90E-07
4	RT = 0.943	dT =		8.00 min		σ'_c =	0.7 ksf	0.276	0.281	io= 18.0	1%
initial											
final											
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	10.031	cm	ε_{axial} =	1.5%
Ac =	41.177	cm^2		
Vc=	413.04	cm^3	ε_{vol} =	2.9%
Sc =	0.244	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	16.06	124.7	107.5	77.9
PreTest	18.95	131.6	110.7	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **8.82E-07** cm/sec

(i_o)ave = 18.0

Tested By: DT | Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: MW-4A | Test No.: P6274

Project Name: | SAMPLE: horizontal | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. 5 | Apparatus No. 1 | Stage No.: 2

Preliminary Length/Area Calculations

Lo =	2.249	in	Lo=	5.712	cm
dLc=	0.031	in	Ao =	18.88	cm^2
Lc=	2.218	in	Vo =	107.87	cm^3
			Lc=	5.634	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	4.46	cm^3
			Vc =	103.41	cm^3
Sc =	0.307	cm^{-1}	Ac=	18.356	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or	
	x	with stones or		Stones with filter paper or	top + bottom
2) Specimen orientation for:		Vertical or	x	Horizontal permeability determination	
3) During saturation: Water flushed up sides of specimen to remove a	x	No		Yes	
4) During consolidation:	x	Top and bottom drainage or		Top	Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation	
6) Permeant: water used	x	Tap		Distilled	
or		Demineralized		0.005 N calcium sulfate (CaSO4)	

Equations Used

Kt = - 0.0000760 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.319

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.2	1/22/02	10	13	00	105.0	100.0	50.00	43.32	0.98	3.14E-05
final	22.2	1/22/02	10	13	40			47.00	44.30		2.87E-05
1	RT = 0.951	dT =		0.67 min		σ'_c =	0.7 ksf	0.227	0.232	io= 14.9	1%
initial	22.2	1/22/02	10	14	00	105.0	100.0	50.00	43.32	0.98	3.14E-05
final	22.2	1/22/02	10	14	40			47.00	44.30		2.87E-05
2	RT = 0.951	dT =		0.67 min		σ'_c =	0.7 ksf	0.227	0.232	io= 14.9	1%
initial	22.2	1/22/02	10	15	00	105.0	100.0	50.00	43.32	0.99	3.10E-05
final	22.2	1/22/02	10	15	53			46.50	44.45		2.84E-05
3	RT = 0.951	dT =		0.88 min		σ'_c =	0.7 ksf	0.265	0.268	io= 14.9	-1%
initial	22.2	1/22/02	10	16	00	105.0	100.0	50.00	43.32	0.99	3.10E-05
final	22.2	1/22/02	10	16	53			46.50	44.45		2.84E-05
4	RT = 0.951	dT =		0.88 min		σ'_c =	0.7 ksf	0.265	0.268	io= 14.9	-1%
initial											
final											
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	5.634	cm	ε_{axial} =	1.4%
Ac =	19.071	cm^2		
Vc=	107.44	cm^3	ε_{vol} =	0.4%
Sc =	0.295	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	18.66	127.7	107.6	90.9
PreTest	20.30	130.0	108.1	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **2.86E-05** cm/sec

(i_o)ave = 14.9

Tested By: DT Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: MW-62 | Test No.: P6266

Project Name: | SAMPLE: vertical | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. 5 | Apparatus No. 4 | Stage No.: 2

Preliminary Length/Area Calculations

Lo =	4.010	in	Lo=	10.184	cm
dLc=	0.092	in	Ao =	41.80	cm^2
Lc=	3.918	in	Vo =	425.66	cm^3
			Lc=	9.951	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	29.30	cm^3
			Vc =	396.36	cm^3
Sc =	0.250	cm^{-1}	Ac=	39.832	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or	
	x	with stones or		Stones with filter paper or	top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination	
3) During saturation: Water flushed up sides of specimen to remove a	x	No		Yes	
4) During consolidation:	x	Top and bottom drainage or		Top	Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation	
6) Permeant: water used	x	Tap		Distilled	
or		Demineralized		0.005 N calcium sulfate (CaSO4)	

Equations Used

Kt = - 0.0000773 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.3133

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.7	1/21/02	00	00	00	105.0	100.0	59.00	46.00	0.99	1.07E-05
final	22.7	1/21/02	00	00	56			55.00	47.26		9.58E-06
1	RT = 0.938	dT =		0.93 min		σ'_c =	0.7 ksf	0.306	0.308	io= 16.4	1%
initial	22.7	1/21/02	00	00	00	105.0	100.0	59.00	46.00	0.99	1.07E-05
final	22.7	1/21/02	00	00	56			55.00	47.26		9.58E-06
2	RT = 0.938	dT =		0.93 min		σ'_c =	0.7 ksf	0.306	0.308	io= 16.4	1%
initial	22.7	1/21/02	00	00	00	105.0	100.0	59.00	46.00	0.99	1.05E-05
final	22.7	1/21/02	00	00	57			55.00	47.26		9.41E-06
3	RT = 0.938	dT =		0.95 min		σ'_c =	0.7 ksf	0.306	0.308	io= 16.4	-1%
initial	22.7	1/21/02	00	00	00	105.0	100.0	59.00	46.00	0.99	1.05E-05
final	22.7	1/21/02	00	00	57			55.00	47.26		9.41E-06
4	RT = 0.938	dT =		0.95 min		σ'_c =	0.7 ksf	0.306	0.308	io= 16.4	-1%
initial											
final											
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	9.951	cm	ε_{axial} =	2.3%
Ac =	41.785	cm^2		
Vc=	415.80	cm^3	ε_{vol} =	2.3%
Sc =	0.238	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	58.75	100.9	63.5	96.2
PreTest	58.80	103.3	65.1	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **9.50E-06** cm/sec

(i_o)ave = 16.4

Tested By: DT | Reviewed By: G. Thomas

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 51-00070007 | BORING: MW-62 | Test No.: P6272

Project Name: | SAMPLE: horizontal | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. H-2 | Apparatus No. 5 | Stage No.: 2

Preliminary Length/Area Calculations

Lo =	2.210	in	Lo=	5.613	cm
dLc=	0.033	in	Ao =	19.11	cm^2
Lc=	2.178	in	Vo =	107.27	cm^3
			Lc=	5.531	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	4.73	cm^3
			Vc =	102.54	cm^3
Sc =	0.298	cm^{-1}	Ac=	18.539	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or	
	x	with stones or		Stones with filter paper or	top + bottom
2) Specimen orientation for:		Vertical or	x	Horizontal permeability determination	
3) During saturation: Water flushed up sides of specimen to remove a	x	No		Yes	
4) During consolidation:	x	Top and bottom drainage or		Top	Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation	
6) Permeant: water used	x	Tap		Distilled	
or		Demineralized		0.005 N calcium sulfate (CaSO4)	

Equations Used

Kt = - 0.0000748 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 °C = RT * Kt TubeC= 1.3223

Consol Stage-Trial No.	Temp. °C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Permeability Preliminary Final at 20°C cm/sec Dev. from Ave.
initial	22.2	1/22/02	10	24	00	105.0	100.0	58.00	48.31	0.98	1.36E-07
final	22.2	1/22/02	10	58	00			56.63	48.76		1.26E-07
1	RT = 0.951	dT =		34.00 min		σ'_c =	0.7 ksf	0.102	0.104	io= 22.0	4%
initial	22.2	1/22/02	11	00	00	105.0	100.0	58.20	48.23	0.94	1.28E-07
final	22.2	1/22/02	11	37	39			56.74	48.73		1.19E-07
2	RT = 0.951	dT =		37.65 min		σ'_c =	0.7 ksf	0.109	0.116	io= 22.7	-3%
initial	22.2	1/22/02	11	40	00	105.0	100.0	58.00	48.31	1.00	1.34E-07
final	22.2	1/22/02	12	15	23			56.60	48.76		1.24E-07
3	RT = 0.951	dT =		35.38 min		σ'_c =	0.7 ksf	0.104	0.104	io= 22.0	2%
initial	22.2	1/22/02	12	17	00	105.0	100.0	58.25	48.22	0.94	1.26E-07
final	22.2	1/22/02	12	53	00			56.85	48.70		1.18E-07
4	RT = 0.951	dT =		36.00 min		σ'_c =	0.7 ksf	0.104	0.111	io= 22.8	-3%
initial											
final											
initial											
final											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	5.531	cm	ε_{axial} =	1.5%
Ac =	18.937	cm^2		
Vc=	104.74	cm^3	ε_{vol} =	2.4%
Sc =	0.292	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_t (pcf)	γ_d (pcf)	S (%)
Initial	60.04	100.4	62.7	96.3
PreTest	60.01	102.8	64.2	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **1.22E-07** cm/sec

(i_o)ave = 22.4

Tested By: DT Reviewed By: G. Thomas

URS

Test Summary

Rhodia Peyton Slough

51-00070007.00

Sample Number	Moisture Content, %	Wet Density, psf	Dry Density, psf	Permeability, k cm/sec	Porosity, %
HC - 1 - 9 VERTICAL	112.1	86.1	40.6	6.45E-08	75.20
HC - 1 - 9 HORIZONTAL	123.3	78.3	35.1	8.27E-08	78.57
HC - 2 - 9 VERTICAL	283.1	67.7	17.7	1.56E-07	
HC - 2 - 9 HORIZONTAL	344.0	66.4	14.9	1.27E-07	
HC - 3 - 9 VERTICAL	83.2	93.4	51.0	8.17E-08	69.27
HC - 3 - 9 HORIZONTAL	88.0	94.6	50.3	4.24E-08	69.67
HC - 4 - 9 VERTICAL	134.0	81.7	34.9	1.07E-07	
HC - 4 - 9 HORIZONTAL	135.1	83.1	35.4	3.60E-08	

URS

ASTM D5084-90
Hydraulic Conductivity

Project Name: Rhodia Peyton Slough | Project Number: 51-0007007.00 | 02/05/2002

Location: Martinez, CA | **Vertical Permeability**

Boring: HC - 1 | Sample: 9 | Depth: NA

Description: Gray clay (Bay Mud) with organics

Diameter, cm: 7.264 | Height, cm: 6.8 | Area, cm^2: 41.44

Wet Weight Before Test: 388.80 gms | Initial Water Content: 112.05%

Wet Weight After Test: 340.00 gms | Final Water Content: 85.44%

Dry Weight: 183.35 gms | Volume, cm^3: 281.81

Moist Unit Weight, pcf: 86.1 | Dry Unit Weight, pcf: 40.6

Cell Pressure: 85.00 psi | Standpipe Area, cm^2 0.0851 | Effective Pressure: 5.00 psi

Back Pressure: 80.00 psi | Permeability Board: 1

P-Left, psi	P-Right, psi	Standpipe Height	Centi-meters	Time, minutes	Time, seconds	Hydraulic Conductivity k = cm/sec
80.00	79.29	Initial				
		H1	130.1	0.8		
		H2	54.5			
		Final				
		H1	125.0	262.8	15720	6.44E-08
		H2	59.6			
80.00	79.29	Initial				
		H1	130.1	259.8		
		H2	54.5			
		Final				
		H1	121.4	729.8	28200	6.48E-08
		H2	63.2			
80.00	79.29	Initial				
		H1	130.0	0.3		
		H2	54.6			
		Final				
		H1	121.5	470.3	28200	6.41E-08
		H2	63.3			

Average k = 6.45E-08 cm/sec

URS

ASTM D5084-90
Hydraulic Conductivity

Project Name: Rhodia Peyton Slough

Project Number: 51-0007007.00

02/04/2002

Location: Martinez, CA

Horizontal Permeability

Boring: HC - 1 Sample: 9 Depth: NA

Description: Gray clay (Bay Mud) with organics

Diameter, cm: 4.928 Height, cm: 5.3 Area, cm^2: 19.07

Wet Weight Before Test: 126.87 gms Initial Water Content: 123.28%

Wet Weight After Test: 111.48 gms Final Water Content: 96.20%

Dry Weight: 56.82 gms Volume, cm^3: 101.09

Moist Unit Weight, pcf: 78.3 Dry Unit Weight, pcf: 35.1

Cell Pressure: 85.00 psi Standpipe Area, cm^2 0.0818 Effective Pressure: 5.00 psi

Back Pressure: 80.00 psi Permeability Board: 3

P-Left, psi	P-Right, psi	Standpipe Height	Centi-meters	Time, minutes	Time, seconds	Hydraulic Conductivity k = cm/sec
80.00	79.29	Initial				
		H1	126.5	0.4		
		H2	54.0			
		Final				
		H1	122.4	275.4	16500	8.27E-08
		H2	58.1			
80.00	79.29	Initial				
		H1	126.5	276.2		
		H2	54.2			
		Final				
		H1	121.5	619.2	20580	8.23E-08
		H2	59.2			
80.00	79.29	Initial				
		H1	126.5	0.3		
		H2	54.4			
		Final				
		H1	119.6	484.3	29040	8.32E-08
		H2	61.3			

Average k = 8.27E-08 cm/sec

URS

Specific Gravity of Soils

Project Name: Rhodia - Martinez

Project Number: 51-00070007.00

Location: Martinez, CA

Date: 02/01/02

Test Method: ASTM D854

Sample Number: HC - 1 - 9 Depth, ft. NA

Bottle Number: 1A

Description: Gray clay (Bay Mud) with organics

Determination Number	pycnometer + soil + water gms	pycnometer + water gms	temperature F	Specific Gravity
1	701.7	671.28	74.0	2.623
2	702.1	671.71	66.0	2.621
3	702.5	672.09	59.0	2.626
			Average	2.623

Oven dried soil + tare, gms	299.43
tare, gms	250.34
Oven dried soil	49.09

URS

ASTM D5084-90
Hydraulic Conductivity

Project Name: Rhodia Peyton Slough | Project Number: 51-0007007.00 | 02/05/2002

Location: Martinez, CA | **Vertical Permeability**

Boring: **HC - 2** Sample: **9** Depth: **NA**

Description: Gray peaty clay / clayey peat

Diameter, cm: 7.214 Height, cm: 8.30 Area, cm^2: 40.87

Wet Weight Before Test: 367.96 gms Initial Water Content: 283.05%

Wet Weight After Test: 299.75 gms Final Water Content: 212.04%

Dry Weight: 96.06 gms Volume, cm^3: 339.25

Moist Unit Weight, pcf: 67.7 Dry Unit Weight, pcf: 17.7

Cell Pressure: 85.00 psi Standpipe Area, cm^2 0.0818 Effective Pressure: 5.00 psi

Back Pressure: 80.00 psi Permeability Board: 3

P-Left, psi	P-Right, psi	Standpipe Height	Centi-meters	Time, minutes	Time, seconds	Hydraulic Conductivity k = cm/sec
80.00	**79.29**	**Initial**				
		H1	125.3	0.4		
		H2	54.8			
		Final				
		H1	120.1	140.4	**8400**	**1.58E-07**
		H2	60.0			
80.00	**79.29**	**Initial**				
		H1	125.4	141.6		
		H2	54.7			
		Final				
		H1	115.9	423.6	**16920**	**1.54E-07**
		H2	64.2			
80.00	**79.29**	**Initial**				
		H1	125.3	0.3		
		H2	54.8			
		Final				
		H1	116.7	247.3	**14820**	**1.57E-07**
		H2	63.4			

Average k = 1.56E-07 cm/sec

URS

ASTM D5084-90
Hydraulic Conductivity

Project Name: Rhodia Peyton Slough | Project Number: 51-0007007.00 | 02/01/2002

Location: Martinez, CA | **Horizontal Permeability**

Boring: HC - 2 | Sample: 9 | Depth: NA

Description: Brown peat

Diameter, cm: 4.928 | Height, cm: 5.2 | Area, cm^2: 19.07

Wet Weight Before Test: 105.50 gms | Initial Water Content: 344.02%

Wet Weight After Test: 83.63 gms | Final Water Content: 251.98%

Dry Weight: 23.76 gms | Volume, cm^3: 99.18

Moist Unit Weight, pcf: 66.4 | Dry Unit Weight, pcf: 14.9

Cell Pressure: 85.00 psi | Standpipe Area, cm^2 0.0818 | Effective Pressure: 5.00 psi

Back Pressure: 80.00 psi | Permeability Board: 3

P-Left, psi	P-Right, psi	Standpipe Height	Centi-meters	Time, minutes	Time, seconds	Hydraulic Conductivity k = cm/sec
80.00	**79.29**	**Initial**				
		H1	127.0	0.3		
		H2	53.7			
		Final				
		H1	116.9	465.3	**27900**	**1.29E-07**
		H2	63.8			
80.00	**79.29**	**Initial**				
		H1	127.0	0.6		
		H2	53.7			
		Final				
		H1	115.1	590.6	**35400**	**1.24E-07**
		H2	65.6			
80.00	**79.29**	**Initial**				
		H1	127.0	0.2		
		H2	53.8			
		Final				
		H1	119.9	315.2	**18900**	**1.27E-07**
		H2	60.9			

Average k = 1.27E-07 cm/sec

URS

ASTM D5084-90
Hydraulic Conductivity

Project Name: Rhodia Peyton Slough | Project Number: 51-0007007.00 | 02/05/2002

Location: Martinez, CA | **Vertical Permeability**

Boring: **HC - 3** Sample: **9** Depth: **NA**

Description: Dark brown clay (Bay Mud) with organics

Diameter, cm: 7.264 Height, cm: 8.00 Area, cm^2: 41.44

Wet Weight Before Test: 496.20 gms Initial Water Content: 83.15%

Wet Weight After Test: 461.30 gms Final Water Content: 70.27%

Dry Weight: 270.92 gms Volume, cm^3: 331.54

Moist Unit Weight, pcf: 93.4 Dry Unit Weight, pcf: 51.0

Cell Pressure: 85.00 psi Standpipe Area, cm^2 0.0836 Effective Pressure: 5.00 psi

Back Pressure: 80.00 psi Permeability Board: 2

P-Left, psi	P-Right, psi	Standpipe Height	Centi-meters	Time, minutes	Time, seconds	Hydraulic Conductivity k = cm/sec
80.00	**79.29**	**Initial**				
		H1	132.5	0.7		
		H2	53.6			
		Final				
		H1	127.7	215.7	**12900**	**8.12E-08**
		H2	58.4			
80.00	**79.29**	**Initial**				
		H1	132.3	216.6		
		H2	53.7			
		Final				
		H1	127.1	448.6	**13920**	**8.23E-08**
		H2	58.9			
80.00	**79.29**	**Initial**				
		H1	132.3	0.1		
		H2	53.7			
		Final				
		H1	122.5	473.1	**28380**	**8.16E-08**
		H2	63.5			

Average k = 8.17E-08 cm/sec

URS

ASTM D5084-90
Hydraulic Conductivity

Project Name: Rhodia Peyton Slough | Project Number: 51-0007007.00 | 02/04/2002

Location: Martinez, CA | **Horizontal Permeability**

Boring: **HC - 3** Sample: **9** Depth: **NA**

Description: Gray clay (Bay Mud)

Diameter, cm: 4.928 Height, cm: 5.3 Area, cm^2: 19.07

Wet Weight Before Test: 153.25 gms Initial Water Content: 88.04%

Wet Weight After Test: 139.47 gms Final Water Content: 71.13%

Dry Weight: 81.50 gms Volume, cm^3: 101.09

Moist Unit Weight, pcf: 94.6 Dry Unit Weight, pcf: 50.3

Cell Pressure: 85.00 psi Standpipe Area, cm^2 0.0836 Effective Pressure: 5.00 psi

Back Pressure: 80.00 psi Permeability Board: 2

P-Left, psi	P-Right, psi	Standpipe Height	Centi-meters	Time, minutes	Time, seconds	Hydraulic Conductivity k = cm/sec
80.00	**79.29**	**Initial**				
		H1	135.4	0.2		
		H2	51.5			
		Final				
		H1	131.1	488.2	**29280**	**4.29E-08**
		H2	55.8			
80.00	**79.29**	**Initial**				
		H1	135.4	0.3		
		H2	51.5			
		Final				
		H1	132.7	297.3	**17820**	**4.34E-08**
		H2	54.2			
80.00	**79.29**	**Initial**				
		H1	135.3	0.2		
		H2	51.6			
		Final				
		H1	133.0	265.2	**15900**	**4.13E-08**
		H2	53.9			

Average k = 4.25E-08 cm/sec

URS

Specific gravity of Soils

Project Name: Rhodia - Martinez

Project Number: 51-00070007.00

Location: Martinez, CA

Date: 02/01/02

Test Method: ASTM D854

Sample Number: HC - 3 - 9 Depth, ft. NA

Bottle Number: 2

Description: Gray clay (Bay Mud)

Determination Number	pycnometer + soil + water gms	pycnometer + water gms	temperature F	Specific Gravity
1	701.8	666.94	74.0	2.657
2	702.1	667.22	68.0	2.661
3	702.4	667.54	61.0	2.660
			Average	2.659

Oven dried soil + tare, gms	335.72
tare, gms	279.9
Oven dried soil	55.82

URS

ASTM D5084-90
Hydraulic Conductivity

Project Name: Rhodia Peyton Slough | Project Number: 51-0007007.00 | 02/04/2002

Location: Martinez, CA | **Vertical Permeability**

Boring: HC - 4 | Sample: 9 | Depth: NA

Description: Gray clay (Bay Mud)

Diameter, cm: 7.214 | Height, cm: 8.00 | Area, cm^2: 40.87

Wet Weight Before Test: 428.00 gms | Initial Water Content: 134.03%

Wet Weight After Test: 401.80 gms | Final Water Content: 119.71%

Dry Weight: 182.88 gms | Volume, cm^3: 326.99

Moist Unit Weight, pcf: 81.7 | Dry Unit Weight, pcf: 34.9

Cell Pressure: 85.00 psi | Standpipe Area, cm^2 0.0851 | Effective Pressure: 5.00 psi

Back Pressure: 80.00 psi | Permeability Board: 1

P-Left, psi	P-Right, psi	Standpipe Height	Centi-meters	Time, minutes	Time, seconds	Hydraulic Conductivity k = cm/sec
80.00	79.29	Initial				
		H1	131.9	0.5		
		H2	53.3			
		Final				
		H1	124.7	235.5	14100	1.20E-07
		H2	60.5			
80.00	79.29	Initial				
		H1	131.8	0.3		
		H2	53.3			
		Final				
		H1	124.0	303.3	18180	1.02E-07
		H2	61.1			
80.00	79.29	Initial				
		H1	131.8	305.0		
		H2	53.3			
		Final				
		H1	124.1	592.0	17220	1.06E-07
		H2	61.0			

Average k = 1.09E-07 cm/sec

URS

ASTM D5084-90
Hydraulic Conductivity

Project Name: Rhodia Peyton Slough | Project Number: 51-0007007.00 | 02/01/2002

Location: Martinez, CA | **Horizontal Permeability**

Boring: **HC - 4** Sample: **9** Depth: **NA**

Description: Gray clay (Bay Mud)

Diameter, cm: 4.928 Height, cm: 5.3 Area, cm^2: 19.07

Wet Weight Before Test: 134.63 gms Initial Water Content: 135.08%

Wet Weight After Test: 121.16 gms Final Water Content: 111.56%

Dry Weight: 57.27 gms Volume, cm^3: 101.09

Moist Unit Weight, pcf: 83.1 Dry Unit Weight, pcf: 35.4

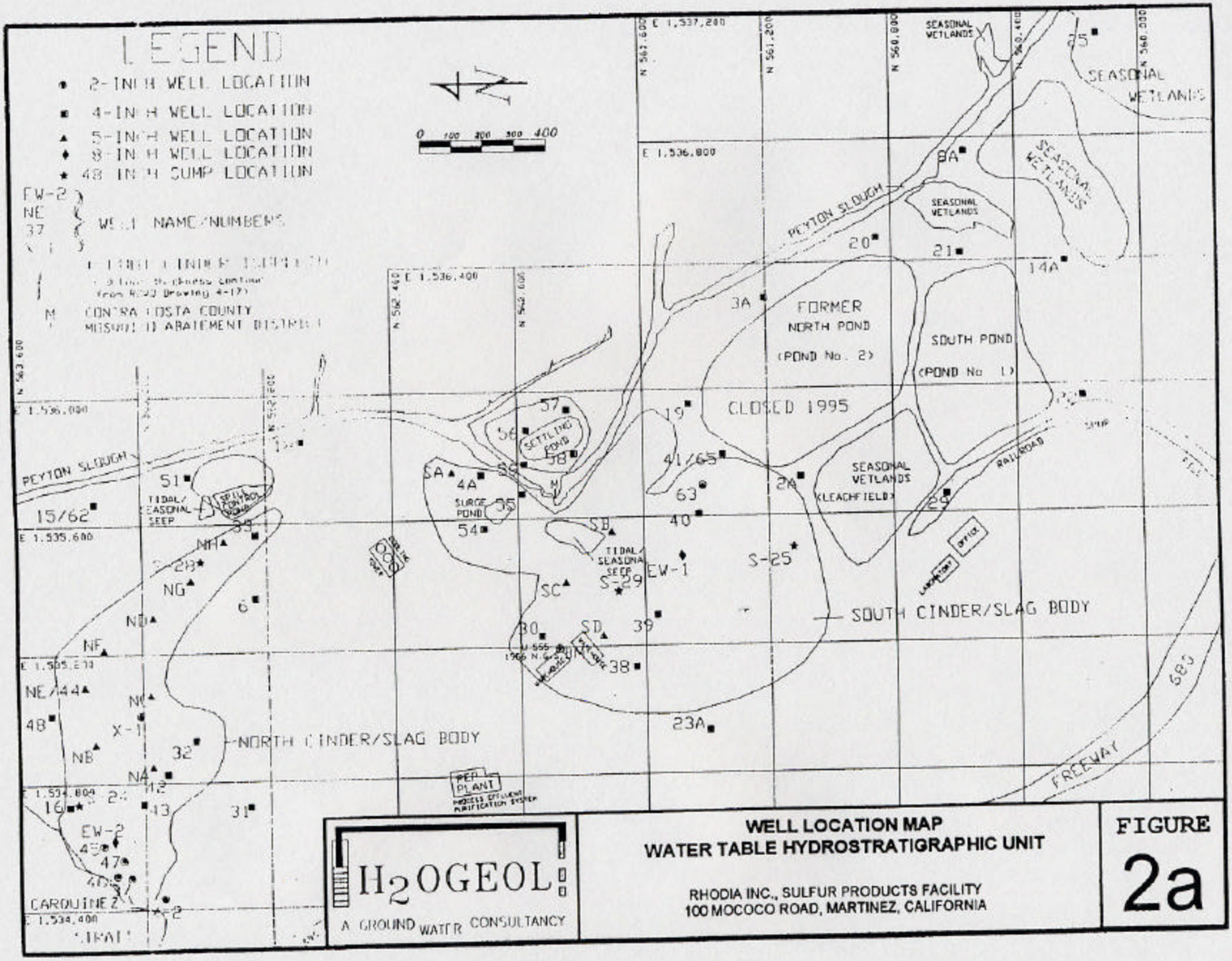
Cell Pressure: 85.00 psi Standpipe Area, cm^2 0.0851 Effective Pressure: 5.00 psi

Back Pressure: 80.00 psi Permeability Board: 1

P-Left, psi	P-Right, psi	Standpipe Height	Centi-meters	Time, minutes	Time, seconds	Hydraulic Conductivity k = cm/sec
80.00	**79.29**	**Initial**				
		H1	133.2	0.1		
		H2	52.8			
		Final				
		H1	131.1	298.1	**17880**	**3.55E-08**
		H2	54.9			
80.00	**79.29**	**Initial**				
		H1	133.2	0.5		
		H2	53.0			
		Final				
		H1	130.4	390.5	**23400**	**3.66E-08**
		H2	55.8			
80.00	**79.29**	**Initial**				
		H1	133.2	0.4		
		H2	53.0			
		Final				
		H1	129.7	503.4	**30180**	**3.58E-08**
		H2	56.5			

Average k = 3.60E-08 cm/sec

Appendix D-4
Seasonal Variability Well Locations

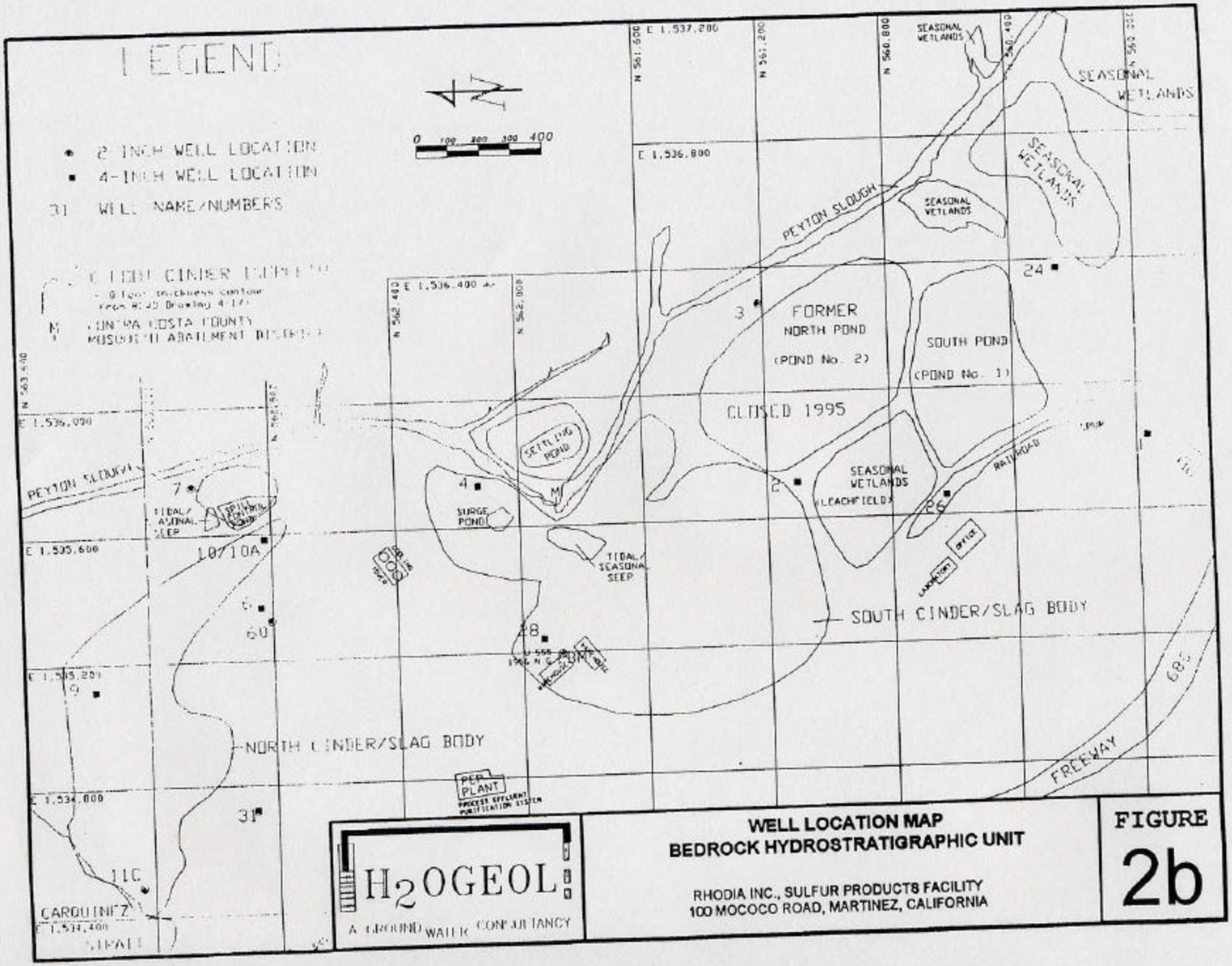


H2OGEOL
A GROUND WATER CONSULTANCY

WELL LOCATION MAP
WATER TABLE HYDROSTRATIGRAPHIC UNIT

RHODIA INC., SULFUR PRODUCTS FACILITY
100 MOCOCO ROAD, MARTINEZ, CALIFORNIA

FIGURE 2a

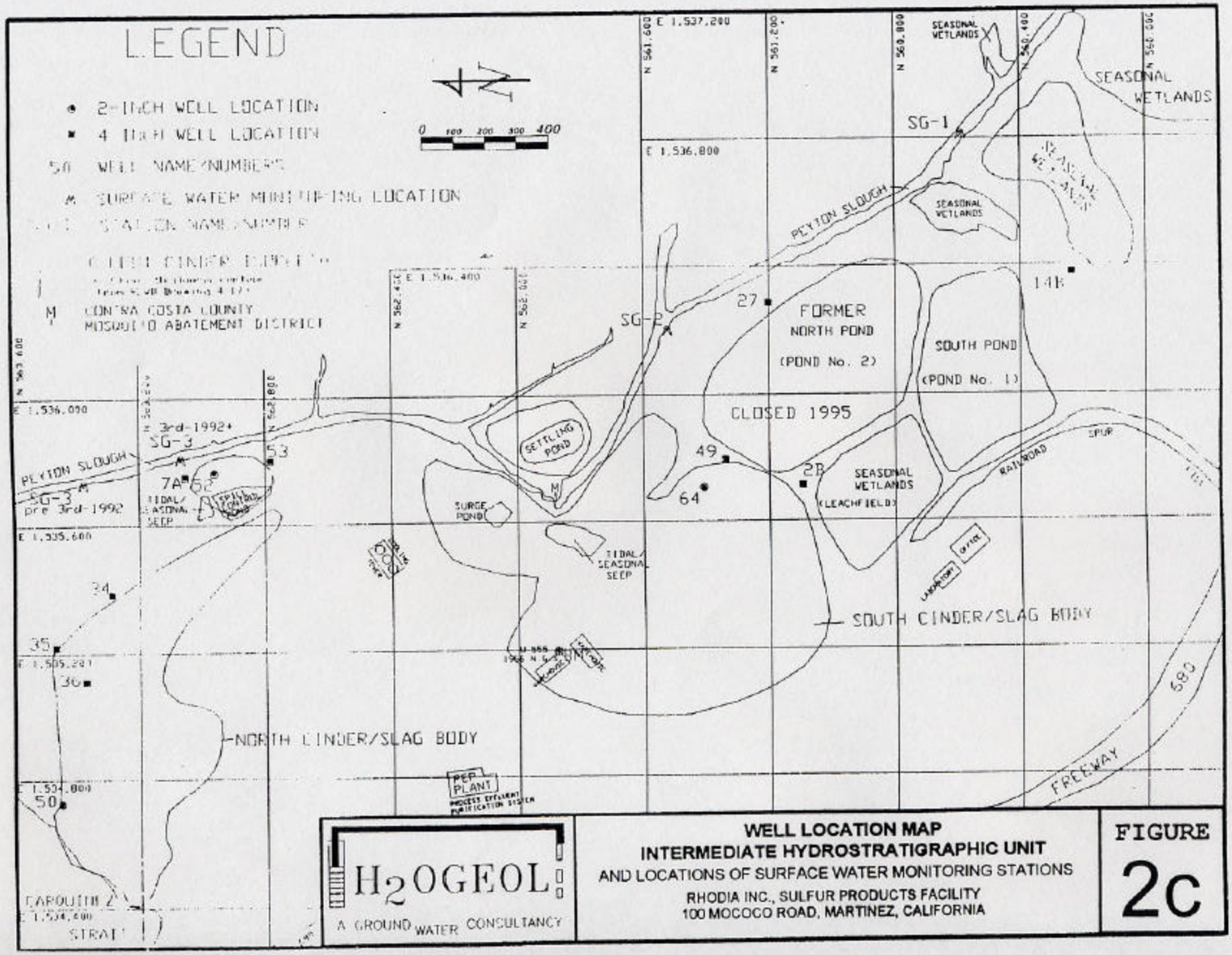


H2OGEOL
A GROUNDWATER CONSULTANCY

WELL LOCATION MAP
BEDROCK HYDROSTRATIGRAPHIC UNIT

RHODIA INC., SULFUR PRODUCTS FACILITY
100 MOCOCO ROAD, MARTINEZ, CALIFORNIA

FIGURE
2b



WELL LOCATION MAP
INTERMEDIATE HYDROSTRATIGRAPHIC UNIT
AND LOCATIONS OF SURFACE WATER MONITORING STATIONS
RHODIA INC., SULFUR PRODUCTS FACILITY
100 MOCOCO ROAD, MARTINEZ, CALIFORNIA

FIGURE 2c

Appendix D-5
Slug Tests

Data Set: X:\x_env_waste\Rhodia Martinez\C3 Remedial Design Rpt\Task 1.3 Hydr & Contaminant Transp\Hyd
Date: 02/19/02
Time: 17:18:43

PROJECT INFORMATION

Company: URS Corporation
Client: Rhodia
Location: Peyton Slough
Test Date: Febraury 2002
Test Well: GRD 1

AQUIFER DATA

Saturated Thickness: 10. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Initial Displacement: 1.174 ft
Casing Radius: 0.04167 ft
Wellbore Radius: 0.04167 ft
Well Skin Radius: 0.0833 ft
Screen Length: 10. ft
Total Well Penetration Depth: 10. ft
Gravel Pack Porosity: 0.3

No. of observations: 92

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.0385	1.173	9.292	0.336
0.0802	1.222	9.883	0.313
0.1235	1.121	10.51	0.292
0.1702	1.111	11.17	0.271
0.2185	1.119	11.88	0.251
0.2702	1.345	12.62	0.23
0.3252	1.234	13.41	0.211
0.3835	1.177	14.25	0.194
0.4452	1.136	15.13	0.176
0.5102	1.103	16.07	0.161
0.5802	1.077	17.07	0.145
0.6535	1.052	18.12	0.131
0.7319	1.029	19.23	0.119
0.8152	1.007	20.42	0.107
0.9035	0.987	21.67	0.096
0.9969	0.967	22.99	0.087
1.095	0.947	24.4	0.079
1.2	0.928	25.89	0.07
1.31	0.908	27.46	0.064
1.427	0.889	29.13	0.058
1.552	0.87	30.9	0.052
1.683	0.852	32.77	0.047
1.823	0.833	34.75	0.043
1.972	0.814	36.86	0.039

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
2.128	0.795	39.08	0.036
2.295	0.776	41.44	0.033
2.472	0.757	43.94	0.031
2.659	0.737	46.59	0.028
2.857	0.717	49.39	0.026
3.067	0.698	52.36	0.024
3.289	0.678	55.5	0.023
3.523	0.658	58.83	0.022
3.772	0.638	62.36	0.02
4.035	0.618	66.1	0.019
4.315	0.597	70.06	0.018
4.612	0.576	74.25	0.016
4.925	0.556	78.7	0.016
5.257	0.534	83.4	0.015
5.609	0.512	88.39	0.014
5.982	0.49	93.67	0.014
6.377	0.468	99.26	0.012
6.795	0.446	105.2	0.011
7.239	0.424	111.5	0.012
7.708	0.402	118.1	0.01
8.207	0.38	125.2	0.01
8.733	0.358	132.6	0.009

SOLUTION

Aquifer Model: Unconfined
Solution Method: KGS Model

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
Kr	0.07434	ft/day
Ss	5.342E-05	ft^{-1}
Kz/Kr	1.	

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
Kr	0.07434	0.003145	ft/day
Ss	5.342E-05	2.15E-05	ft^{-1}
Kz/Kr	1.	not estimated	

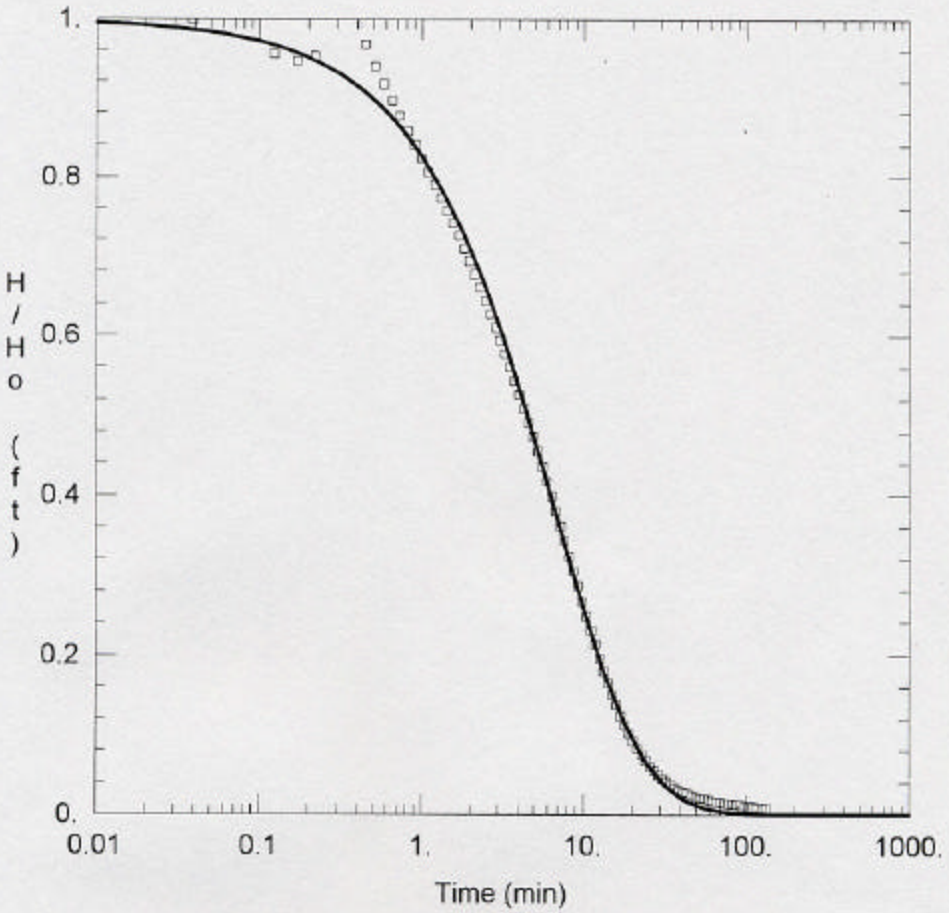
Parameter Correlations

	Kr	Ss
Kr	1.00	-0.91
Ss	-0.91	1.00

Residual Statistics

for weighted residuals

Sum of Squares	0.1163 ft^2
Variance	0.001292 ft^2
Std. Deviation	0.03594 ft
Mean	0.008859 ft
No. of Residuals	92.
No. of Estimates	2



WELL TEST ANALYSIS

Data Set: X:\...\GRD_1.aqt
Date: 02/19/02 Time: 17:18:38

PROJECT INFORMATION

Company: URS Corporation
Client: Rhodia
Test Location: Peyton Slough
Test Well: GRD 1
Test Date: Febraury 2002

AQUIFER DATA

Saturated Thickness: 10. ft

WELL DATA (OW 1)

Initial Displacement: 1.174 ft
Wellbore Radius: 0.04167 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.04167 ft
Well Skin Radius: 0.0833 ft
Total Well Penetration Depth: 10. ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: KGS Model

Kr = 0.07434 ft/day
Ss = 5.342E-05 ft^{-1}